VISHAY

One of the World's Largest Manufacturers of Discrete Semiconductors and Passive Components

Production Part Approval Process

The following PPAP documentation is assembled according to the AIAG, 4th Edition PPAP Manual and applicable customer requirements

IHLP6767GZERxxxM5A

Generic PPAP

Generic PPAP

Click Here to Enter PPAP

2/24/2020

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Vishay / Dale Electronics
1505 East Hway 50 Yankton, SD 57078, USA Phone (605) 665-9301 Fax (605) 668-4247

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Return to PPAP Requirements

Vishay / Dale Electronics
1505 East Hway 50 Yankton, SD 57078, USA Phone (605) 665-9301 Fax (605) 668-4247

IHLP® Automotive Inductors, High Temperature (155 °C) Series

DESIGN SUPPORT TOOLS click logo to get started

3D Models Available
Design Tools Available

STANDARD ELECTRICAL SPECIFICATIONS

L_0 INDUCTANCE ± 20 % AT 100 kHz, 0.25 V, 0 A (µH)	DCR TYP. 25 °C (mΩ)	DCR MAX. 25 °C (mΩ)	HEAT RATING CURRENT DC TYP. (A) (1)	SATURATION CURRENT DC TYP. (A) (2)	SRF TYP. (MHz)
0.47	0.89	0.95	65.0	76.0	52.3
1.0	1.36	1.46	53.0	42.0	35.5
2.2	2.25	2.41	38.5	38.0	19.8
3.3	3.06	3.27	32.2	32.0	16.5
4.7	4.89	5.23	24.0	26.0	14.0
8.2	8.6	9.23	17.5	14.5	9.40
10.0	10.20	10.91	16.0	13.0	7.70
15.0	15.85	16.96	12.5	13.0	8.55
22.0	21.28	22.27	11.7	11.0	5.97
33.0	36.2	38.9	8.8	9.4	4.43
47.0	52.7	56.4	7.25	7.0	3.72

Notes

- All test data is referenced to 25 °C ambient
- Operating temperature range -55 °C to +155 °C
- The part temperature (ambient + temp. rise) should not exceed 155 °C under worst case operating conditions. Circuit design, component placement, PWB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application
- Rated operating voltage (across inductor) = 75 V

(1) DC current (A) that will cause an approximate ΔT of 40 °C
(2) DC current (A) that will cause L_0 to drop approximately 20 %

FEATURES

AUTOMOTIVE GRADE

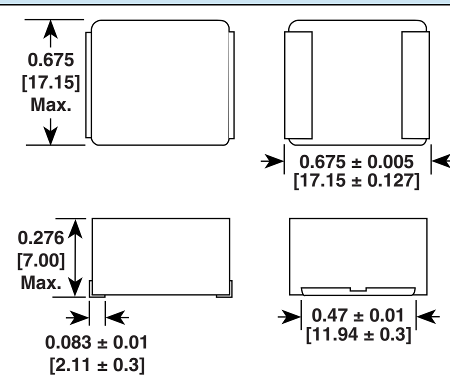
- High temperature, up to 155 °C
- Shielded construction
- Excellent DC/DC energy storage up to 1 MHz to 2 Mhz. Filter inductor applications up the SRF (see Standard Electrical Specifications table).
- Lowest DCR/µH, in this package size
- Handles high transient current spikes without saturation
- Ultra low buzz noise, due to composite construction
- AEC-Q200 qualified
- IHLP design. PATENT(S): www.vishay.com/patents
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free
RoHS COMPLIANT
HALOGEN FREE
GREEN (5-2008)

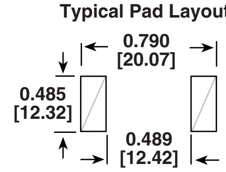
APPLICATIONS

- Engine and transmission control units
- Diesel injection drivers
- DC/DC converters for entertainment/navigation systems
- Noise suppression for motors: windshield wipers / power seats / power mirrors / heating and ventilation blowers / HID lighting
- LED drivers

DIMENSIONS in inches [millimeters]



Typical Pad Layout



DESCRIPTION

IHLP-6767GZ-5A	2.2 µH	± 20 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC® LEAD (Pb)-FREE STANDARD

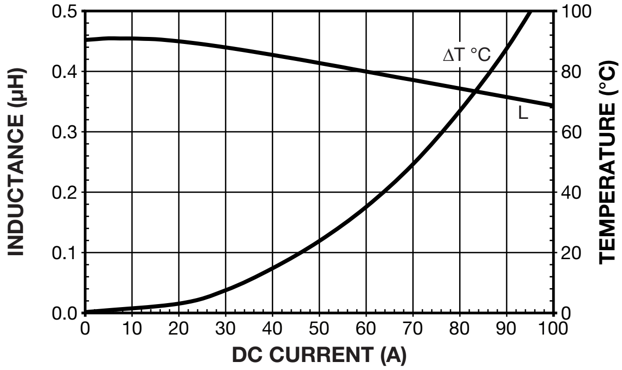
GLOBAL PART NUMBER

I	H	L	P	6	7	6	7	G	Z	E	R	2	R	2	M	5	A
PRODUCT FAMILY				SIZE						PACKAGE CODE		INDUCTANCE VALUE			TOL.	SERIES	

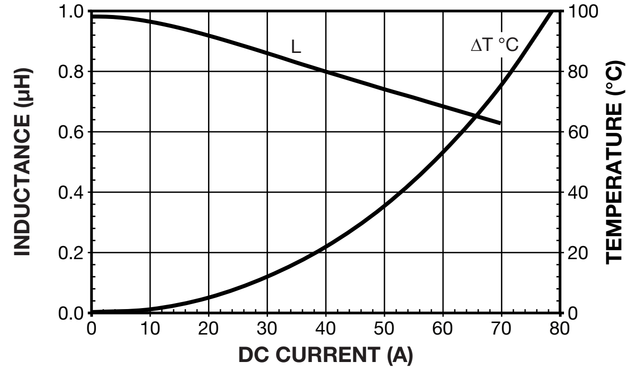
PATENT(S): www.vishay.com/patents
This Vishay product is protected by one or more United States and international patents.

PERFORMANCE GRAPHS

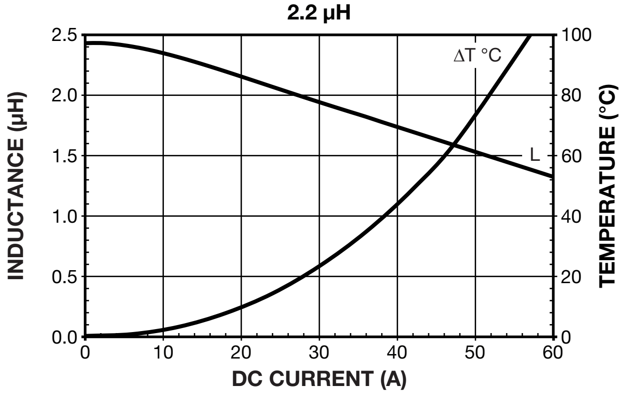
0.47 µH



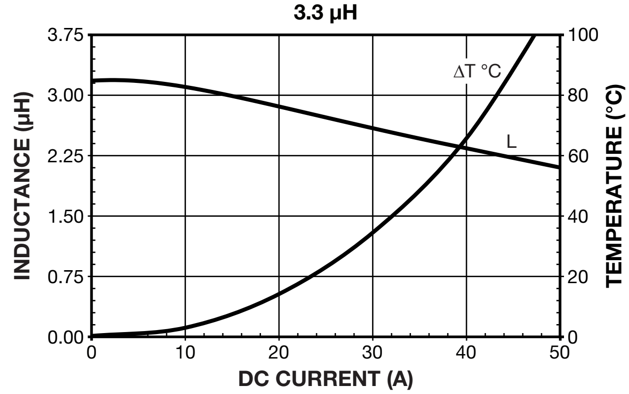
1.0 µH



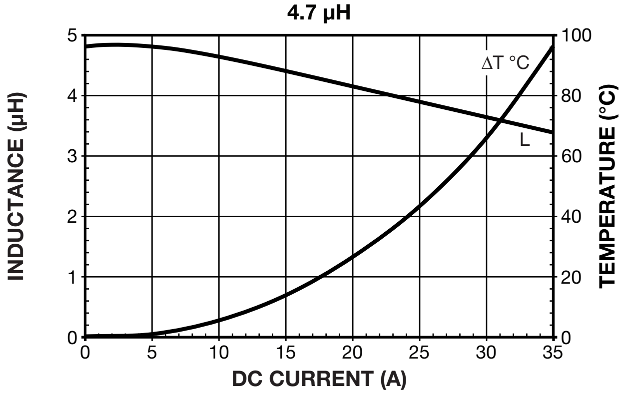
2.2 µH



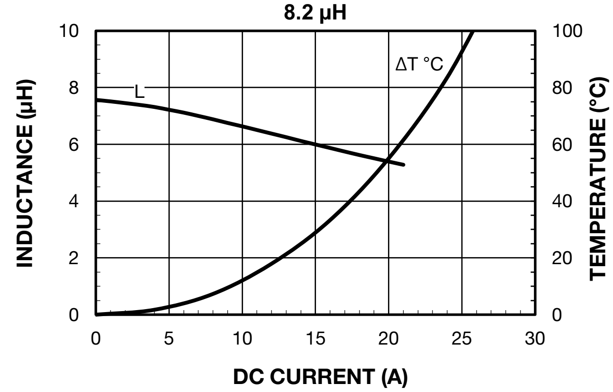
3.3 µH



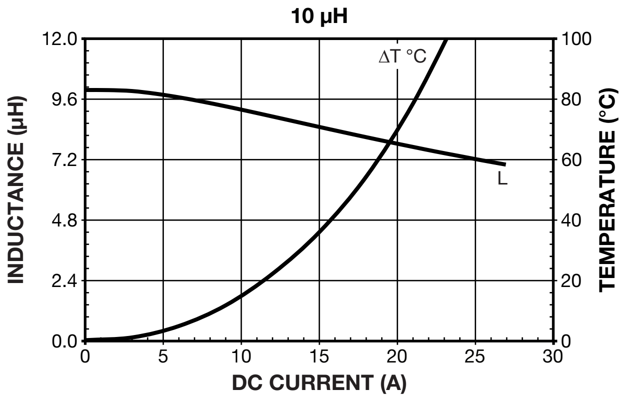
4.7 µH

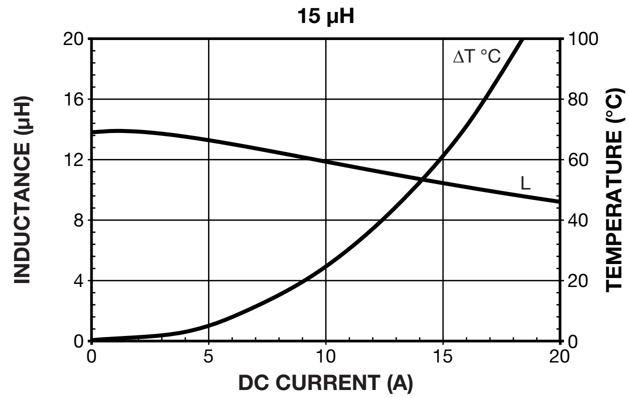


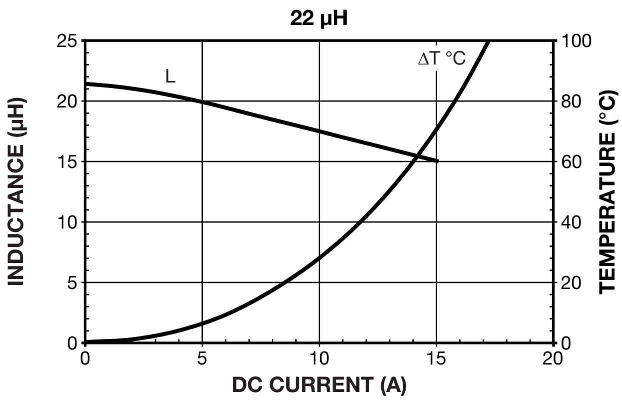
8.2 µH

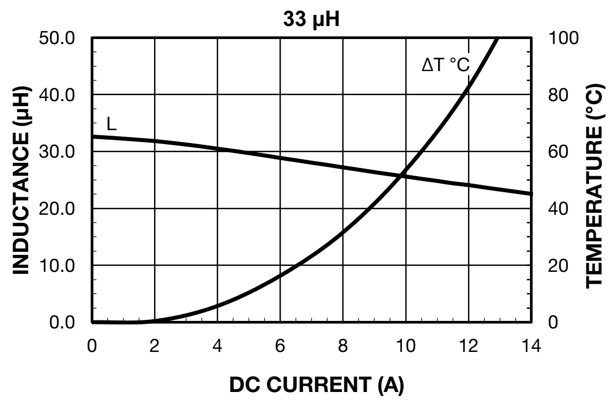


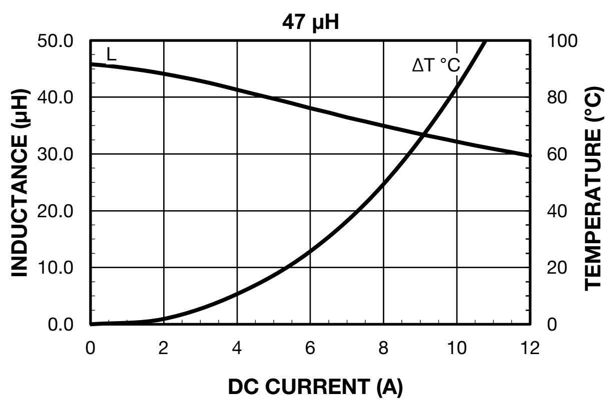
PERFORMANCE GRAPHS





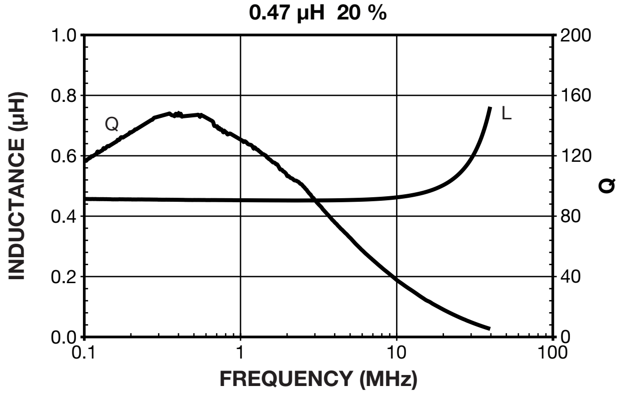




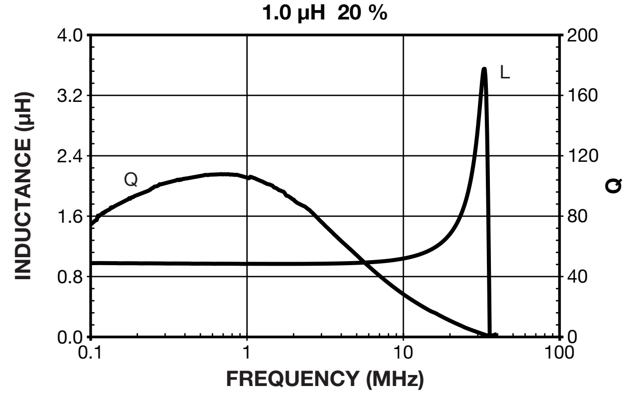


PERFORMANCE GRAPHS: INDUCTANCE AND Q VS. FREQUENCY

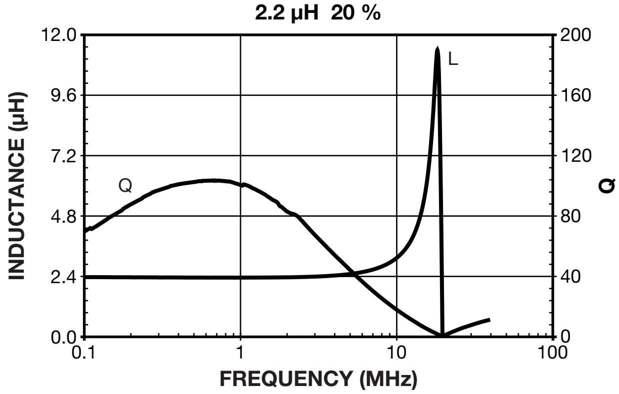
0.47 µH 20 %



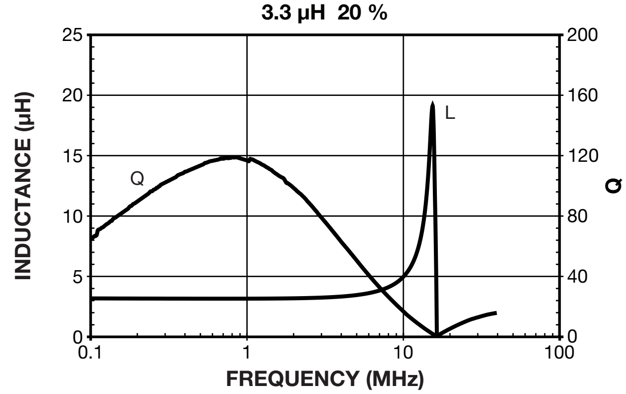
1.0 µH 20 %



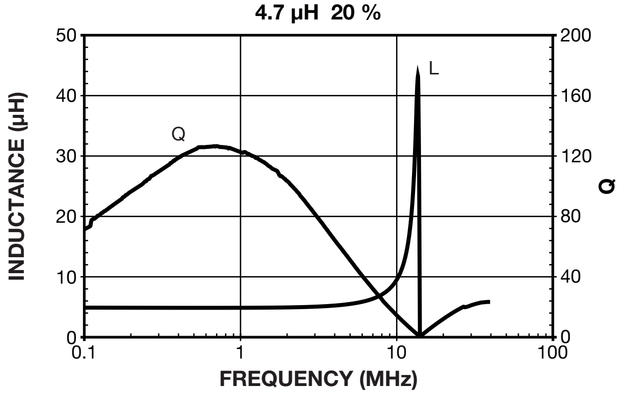
2.2 µH 20 %



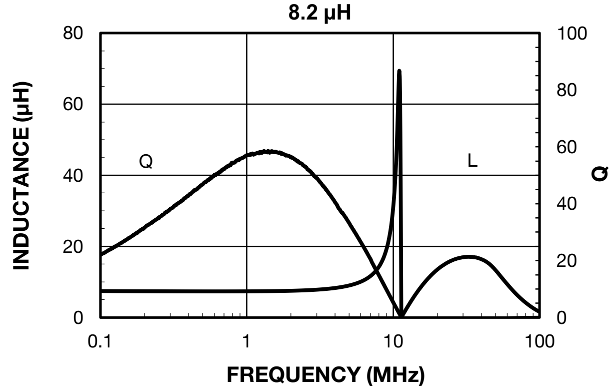
3.3 µH 20 %



4.7 µH 20 %

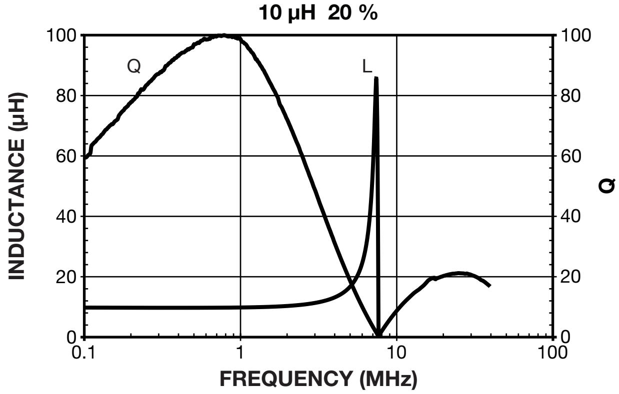


8.2 µH

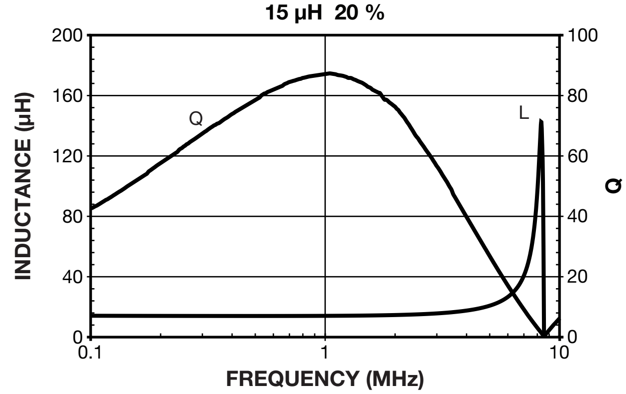


PERFORMANCE GRAPHS: INDUCTANCE AND Q VS. FREQUENCY

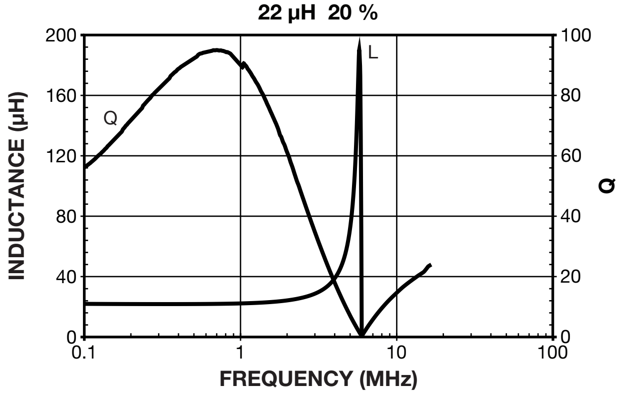
10 µH 20 %



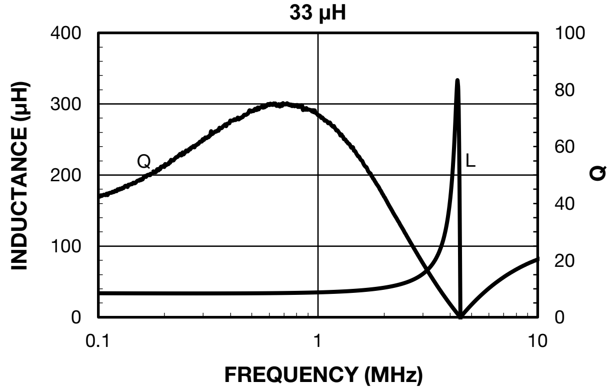
15 µH 20 %



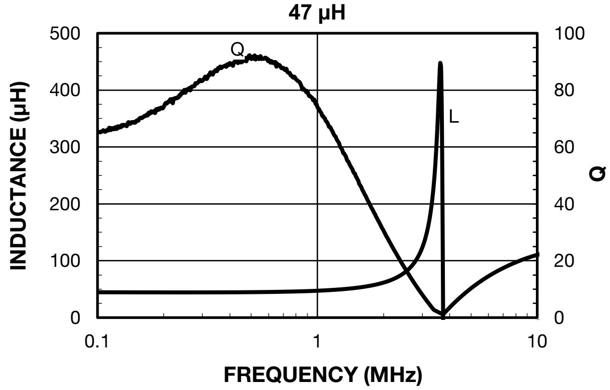
22 µH 20 %



33 µH

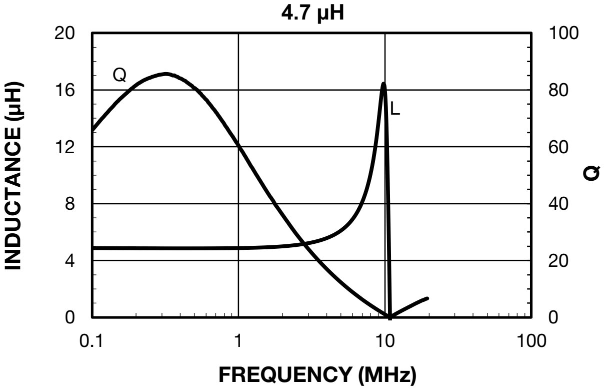


47 µH

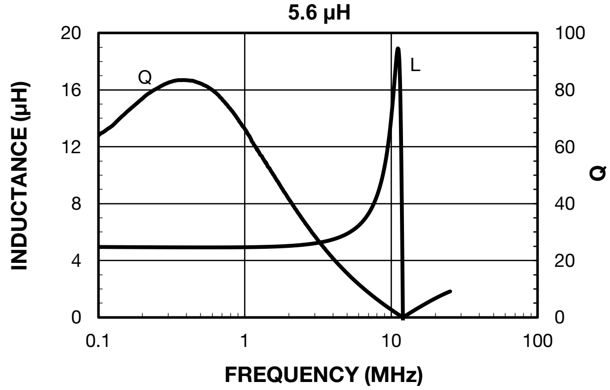


PERFORMANCE GRAPHS: INDUCTANCE AND Q VS. FREQUENCY

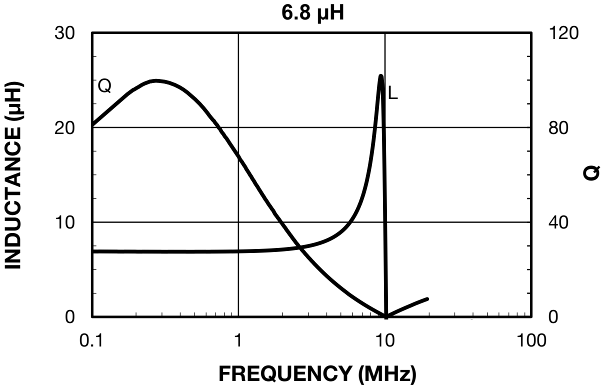
4.7 μH



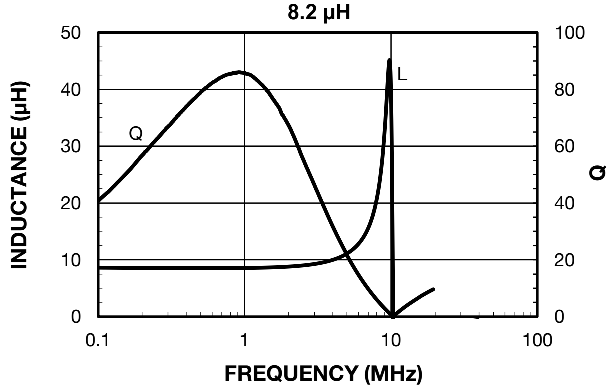
5.6 μH



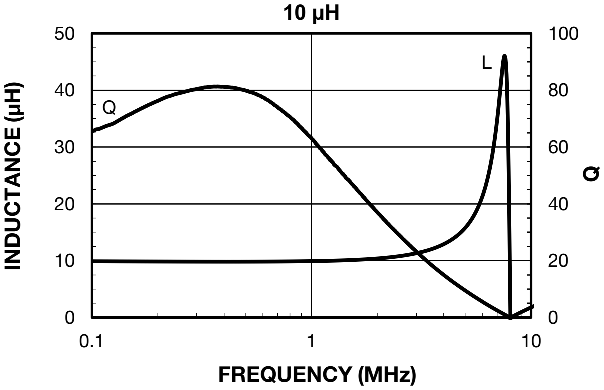
6.8 μH



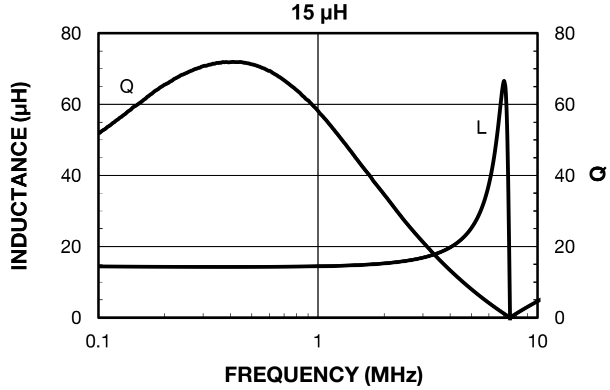
8.2 μH



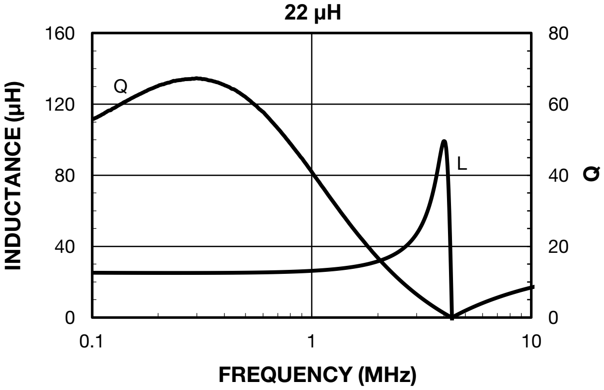
10 μH



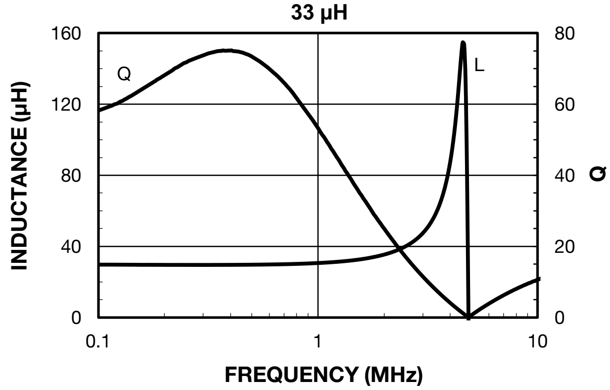
15 μH



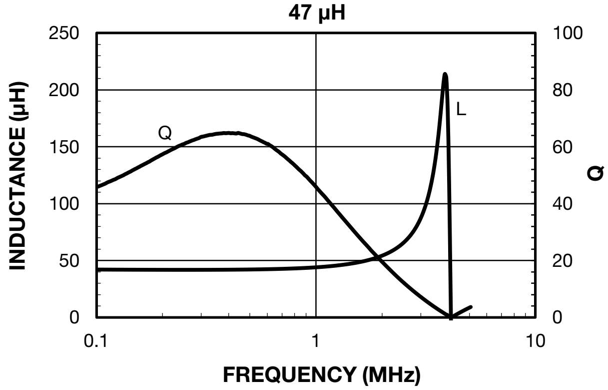
22 μH

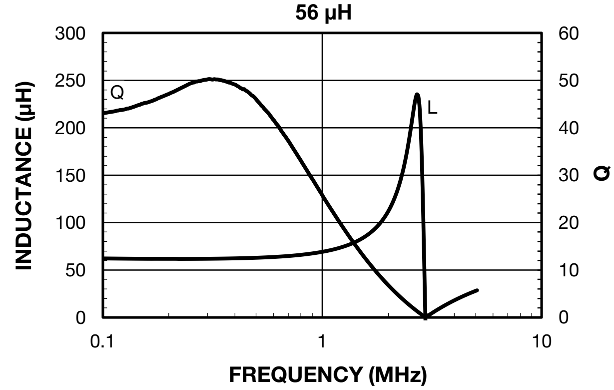


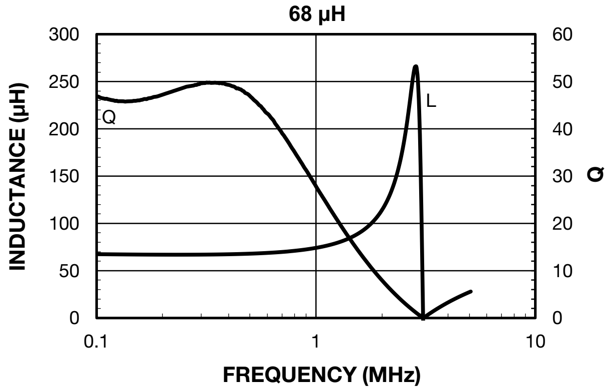
33 μH

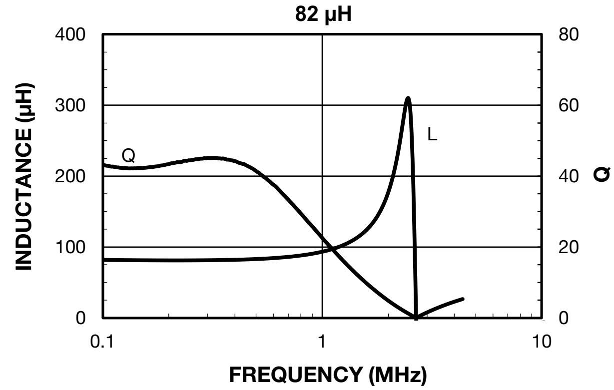


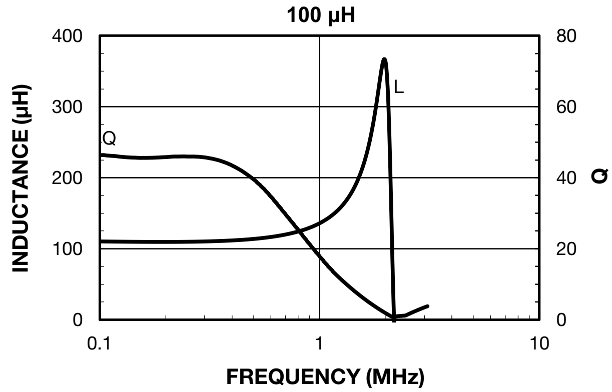
PERFORMANCE GRAPHS: INDUCTANCE AND Q VS. FREQUENCY





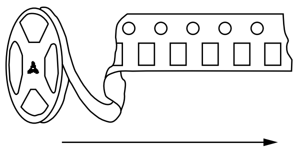




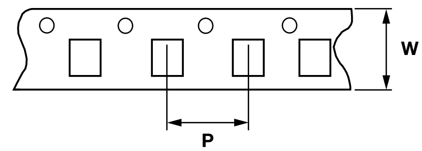


SMD Magnetics Packaging Methods

TAPE AND REEL in inches [millimeters] - Meets EIA RS-481 tape and reel packaging standard



User Direction of Feed



Carrier Dimensions

MODEL	PACKAGE CODE			REEL SIZE	CARRIER TAPE WIDTH (W)	COMPONENT PITCH (P)	UNITS/ REEL	PACKAGE CODE			UNITS/ BULK
	PREVIOUS CODE	GLOBAL CODE LEAD (Pb)-BEARING	GLOBAL CODE LEAD (Pb)-FREE					PREVIOUS CODE	GLOBAL CODE LEAD (Pb)-BEARING	GLOBAL CODE LEAD (Pb)-FREE	
IHLP-1212ABER	-	-	ER	13	0.472 [12.0]	0.315 [8.0]	3000	-	-	-	-
IHLP-1212ABEV	-	-	ER	13	0.472 [12.0]	0.315 [8.0]	4000	-	-	-	-
IHLP-1212AEER	-	-	ER	13	0.472 [12.0]	0.315 [8.0]	3000	-	-	-	-
IHLP-1212BZER	-	-	ER	13	0.472 [12.0]	0.315 [8.0]	3000	-	-	-	-
IHLP-1212BZEV	-	-	ER	13	0.472 [12.0]	0.315 [8.0]	4000	-	-	-	-
IHLP-1616AB	-	-	ER	13	0.472 [12.0]	0.315 [8.0]	4000	-	-	EB	100
IHLP-1616BZ	-	-	ER	13	0.472 [12.0]	0.315 [8.0]	4000	-	-	EB	100
IHLP-2020AB	-	-	ER	13	0.472 [12.0]	0.315 [8.0]	4000	-	-	EB	100
IHLP-2020BZ	-	-	ER	13	0.472 [12.0]	0.315 [8.0]	2000	-	-	EB	100
IHLP-2020CZ	-	-	ER	13	0.472 [12.0]	0.315 [8.0]	2000	-	-	EB	100
IHLP-2525AH	-	-	ER	13	0.630 [16.0]	0.315 [8.0]	2000	-	-	EB	100
IHLP-2525BD	-	-	ER	13	0.630 [16.0]	0.315 [8.0]	2000	-	-	EB	100
IHLP-2525CZ	-	-	ER	13	0.630 [16.0]	0.315 [8.0]	2000	-	-	EB	100
IHLP-2525EZ	-	-	ER	13	0.630 [16.0]	0.472 [12.0]	500	-	-	EB	100
IHLP-3232CZ	-	-	ER	13	0.630 [16.0]	0.472 [12.0]	1000	-	-	EB	100
IHLP-3232DZ	-	-	ER	13	0.630 [16.0]	0.472 [12.0]	500	-	-	EB	100
IHLP-4040DZ	-	-	ER	13	0.945 [24.0]	0.630 [16.0]	500	-	-	EB	100
IHLP-5050CE	-	-	ER	13	0.945 [24.0]	0.630 [16.0]	500	-	-	EB	100
IHLP-5050EZ	-	-	ER	13	0.945 [24.0]	0.630 [16.0]	250	-	-	EB	100
IHLP-5050FD	-	-	ER	13	0.945 [24.0]	0.630 [16.0]	250	-	-	EB	100
IHLP-6767DZ	-	-	ER	13	0.945 [24.0]	0.945 [24.0]	250	-	-	EB	100
IHLP-6767GZ	-	-	ER	13	0.945 [24.0]	0.945 [24.0]	200	-	-	EB	100
IHLP-8787MZ	-	-	ER	13	1.73 [44.0]	1.26 [32.0]	100	-	-	-	-
IHCL-4040DZ	-	-	ER	13	0.945 [24.0]	0.630 [16.0]	500	-	-	EB	100
IHLD-4032KB	-	-	ER	13	0.945 [24.0]	0.630 [16.0]	250	-	-	EB	100
IHLD-3232HB	-	-	ER	13	0.945 [24.0]	0.630 [16.0]	250	-	-	EB	100
IHLE-2525CD	-	-	ER	13	0.630 [16.0]	0.315 [8.0]	2000	-	-	EB	100
IHLE-3232DD	-	-	ER	13	0.630 [16.0]	0.472 [12.0]	500	-	-	EB	100
IHLE-4040DD	-	-	ER	13	0.945 [24.0]	0.630 [16.0]	500	-	-	EB	100
IHLR-4040DZ	-	-	ER	13	0.945 [24.0]	0.630 [16.0]	500	-	-	EB	100
IHLM-2525CZ	-	-	ER	13	0.630 [16.0]	0.315 [8.0]	2000	-	-	EB	100
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IHLW-5050CE	-	-	ER	13	0.945 [24.0]	0.630 [16.0]	500	-	-	EB	100
IFLP-4040DZ	-	-	ER	13	0.945 [24.0]	0.630 [16.0]	500	-	-	EB	100
IFLR-2727EZ	-	-	ER	13	0.630 [16.0]	0.630 [16.0]	1000	-	-	-	-
IFLR-4027EZ	-	-	ER	13	0.945 [24.0]	0.630 [16.0]	1000	-	-	-	-
IFLR-4031GC	-	-	ER	13	0.945 [24.0]	0.472 [12.0]	500	-	-	EB	100
IFLR-5151HZ	-	-	ER	13	0.945 [24.0]	0.630 [16.0]	450	-	-	EB	100

Next Page

TAPE AND REEL in inches [millimeters] - Meets EIA RS-481 tape and reel packaging standard

MODEL	PACKAGE CODE			REEL SIZE	CARRIER TAPE WIDTH (W)	COMPONENT PITCH (P)	UNITS/ REEL	PACKAGE CODE			UNITS/ BULK
	PREVIOUS CODE	GLOBAL CODE LEAD (Pb)-BEARING	GLOBAL CODE LEAD (Pb)-FREE					PREVIOUS CODE	GLOBAL CODE LEAD (Pb)-BEARING	GLOBAL CODE LEAD (Pb)-FREE	
IFSC-0806AZ	-	-	ER	7	0.315 [8.0]	0.157 [4.0]	2000	-	-	-	-
IFSC-1008AB	-	-	ER	7	0.315 [8.0]	0.157 [4.0]	2000	-	-	-	-
IFSC-1111AZ	-	-	ER	7	0.315 [8.0]	0.157 [4.0]	2000	-	-	-	-
IFSC-1111AB	-	-	ER	7	0.315 [8.0]	0.157 [4.0]	2000	-	-	-	-
IFSC-1515AH	-	-	ER	13	0.472 [12.0]	0.315 [8.0]	2000	-	-	-	-
IHHP-0806AZ-01	-	-	ER	7	0.315 [8.0]	0.157 [4.0]	2000	-	-	-	-
IHHP-0806AB-01	-	-	ER	7	0.315 [8.0]	0.157 [4.0]	2000	-	-	-	-
IHHP-1008AZ-01	-	-	ER	7	0.315 [8.0]	0.157 [4.0]	3000	-	-	-	-
IHHP-1008AB-01	-	-	ER	7	0.315 [8.0]	0.157 [4.0]	3000	-	-	-	-
IHHP-1212ZH-01	-	-	ER	7	0.315 [8.0]	0.157 [4.0]	3000	-	-	-	-
IHHP-1212AZ-01	-	-	ER	7	0.315 [8.0]	0.157 [4.0]	3000	-	-	-	-
IHSM-3825	RC2	RE	ER	13	0.945 [24.0]	0.472 [12.0]	750	P09	PJ	EB	100
IHSM-4825	RC2	RE	ER	13	0.945 [24.0]	0.472 [12.0]	750	P09	PJ	EB	100
IHSM-5832	RC3	RF	ER	13	1.26 [32.0]	0.472 [12.0]	500	P09	PJ	EB	100
IHSM-7832	RC4	RG	ER	13	1.73 [44.0]	0.472 [12.0]	500	P09	PJ	EB	100
IDC-2512	-	-	ER	13	0.630 [16.0]	0.315 [8.0]	2000	-	-	-	-
IDC-5020	-	-	ER	13	0.630 [16.0]	0.472 [12.0]	500	-	-	-	-
IDC-7328	-	-	ER	13	0.945 [24.0]	0.945 [24.0]	250	-	-	-	-
IDCS-2512	-	-	ER	13	0.630 [16.0]	0.315 [8.0]	2000	-	-	-	-
IDCS-5020	-	-	ER	13	0.630 [16.0]	0.472 [12.0]	500	-	-	-	-
IDCS-7328	-	-	ER	13	0.945 [24.0]	0.945 [24.0]	250	-	-	-	-
IDCP-1813	-	-	ER	13	0.472 [12.0]	0.315 [8.0]	2000	-	-	-	-
IDCP-2218	-	-	ER	13	0.472 [12.0]	0.315 [8.0]	1500	-	-	-	-
IDCP-3114	-	-	ER	13	0.630 (16.0)	0.472 [12.0]	1000	-	-	-	-
IDCP-3020	-	-	ER	13	0.630 (16.0)	0.472 [12.0]	1000	-	-	-	-
IDCP-3722	-	-	ER	13	0.945 [24.0]	0.472 [12.0]	500	-	-	-	-
IDCP-3916	-	-	ER	13	0.945 [24.0]	0.472 [12.0]	500	-	-	-	-
IFCB-0402	-	-	ER	7	0.315 [8.0]	0.079 [2.0]	10 000	-	-	-	-
ILC-0402	-	-	ER	7	0.315 [8.0]	0.079 [2.0]	10 000	-	-	-	-
ILC-0603	-	-	ER	7	0.315 [8.0]	0.157 [4.0]	4000	-	-	-	-
ILC-0805	-	-	ER	7	0.315 [8.0]	0.157 [4.0]	4000	-	-	-	-
IMC-0402	-	-	ER	7	0.315 [8.0]	0.079 [2.0]	10 000	-	-	-	-
IMC-0402-01	-	-	ER	7	0.315 [8.0]	0.079 [2.0]	10 000	-	-	-	-
IMC-0603	-	-	ER	7	0.315 [8.0]	0.157 [4.0]	4000	-	-	-	-
IMC-0603-01	-	-	ER	7	0.315 [8.0]	0.079 [2.0]	3000	-	-	-	-
IMC-0805-01	-	-	ER	7	0.315 [8.0]	0.157 [4.0]	2000	-	-	-	-
IMC-1008	-	-	ER	7	0.315 [8.0]	0.157 [4.0]	2000	-	-	-	-
IMC-1210	R98/RB3 R99/RB4	SY/AN SZ/R9	ER/ET ES/EU	7 13	0.315 [8.0] 0.315 [8.0]	0.157 [4.0] 0.157 [4.0]	2000 7500	B13	BN	EB	500
IMC-1210-100	R98/RB3 R99/RB4	SY/AN SZ/R9	ER/ET ES/EU	7 13	0.315 [8.0] 0.315 [8.0]	0.157 [4.0] 0.157 [4.0]	2000 7500	B13	BN	EB	500
IMC-1812	R73/R92 R13/R91	RV/RX RQ/RW	ER/ET ES/EU	7 13	0.472 [12.0] 0.472 [12.0]	0.315 [8.0] 0.315 [8.0]	500 2000	B13	BN	EB	500
IMCH-1812	-	-	ER	7	0.472 [12.0]	0.315 [8.0]	500	-	-	-	-
IMC-2220	-	-	ER	13	0.630 [16.0]	0.472 [12.0]	1000	-	-	-	-

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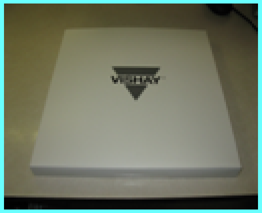
IHLP PACKAGING

COMPONENT PHOTO

POCKET TAPE PHOTO

REEL PHOTO

CONTAINER PHOTO



UNIT LOAD PHOTO

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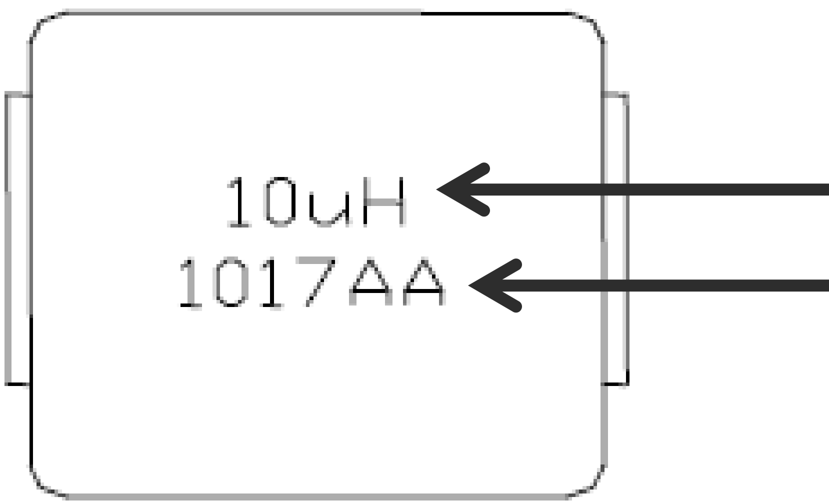
IHLP COMPONENT PRINT



The Inductance Value

DATE CODE:
1017 = 17th week of 2010
The letters behind the date code are used by Vishay to trace each component back to a specific lot

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Production Part Approval Process

The following PPAP documentation is assembled according to AIAG, 4th Edition PPAP Manual and applicable customer requirements

Terminal Plating Info

Part Number (CUSTOMER)	Part Number (Vishay)	Layer structure with base and coating material used:	Layer thickness and tolerances of the coatings (base material, intermediate layer, final finish)	Kind of Coating or technology (e.g. galvanized, chemically hot tin-plated,..)
Generic PPAP	IHLP6767GZERxxxM5A	Cu - Base Material Ni- Intermediate Later Sn- Finish Layer	CU: .254mm +/- .0254mm Ni: 1.27um to 3.175um Sn: 4.57um to 6.35 um	Electroplated

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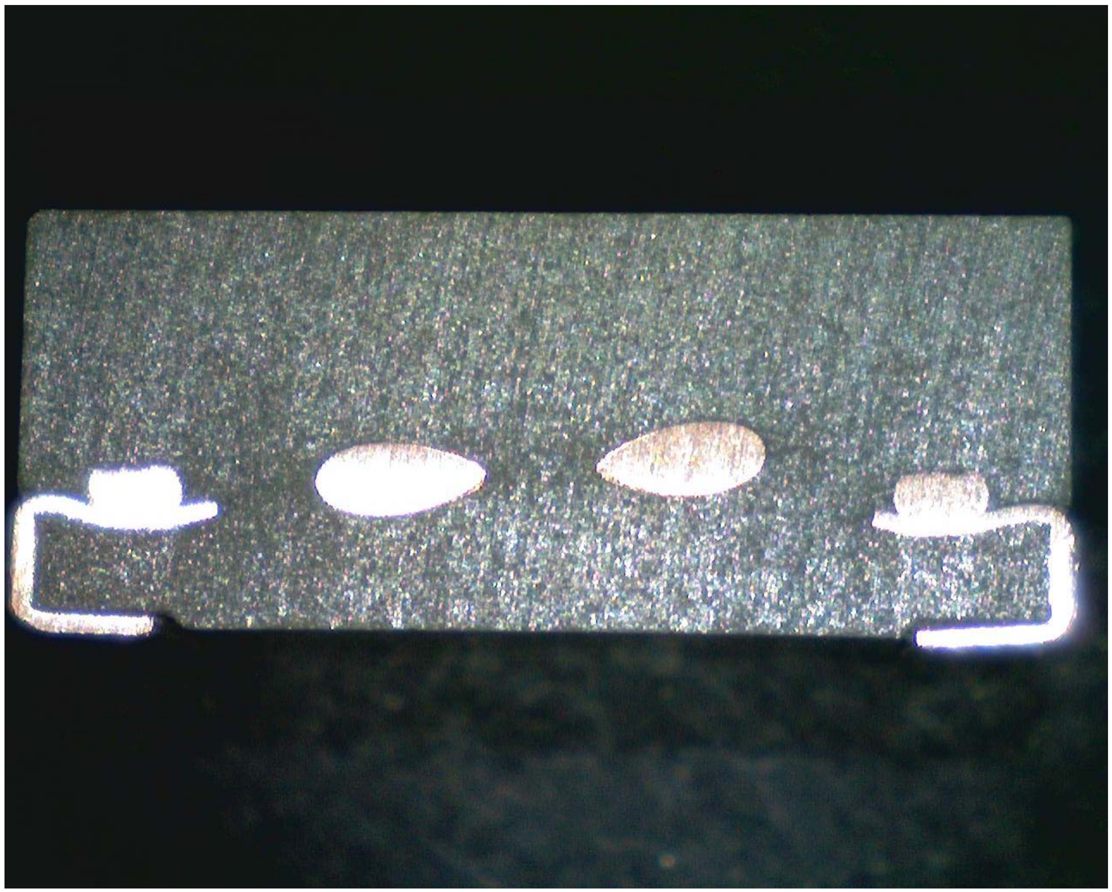
Production Part Approval Process

The following PPAP documentation is assembled according to AIAG, 4th Edition PPAP Manual and applicable customer requirements

Cross-Section
IHLP-6767GZ



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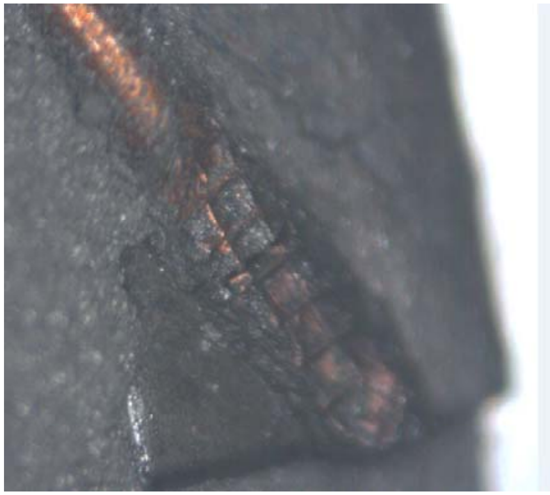
Example Photos of IHLP Welds



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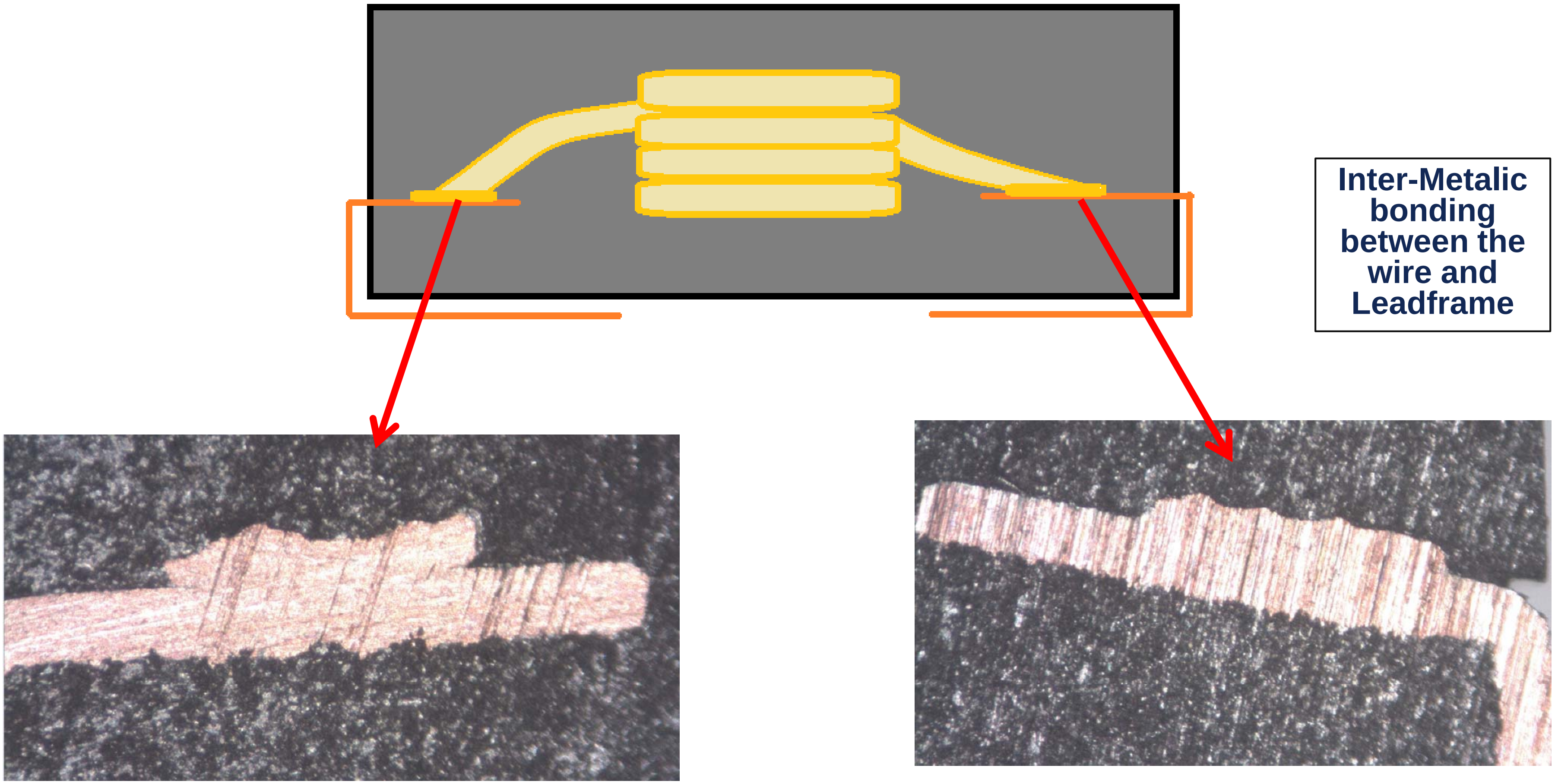
Production Part Approval Process

The following PPAP documentation is assembled according to AIAG, 4th Edition PPAP Manual and applicable customer requirements

Cross sectional Photos of IHLP Welds



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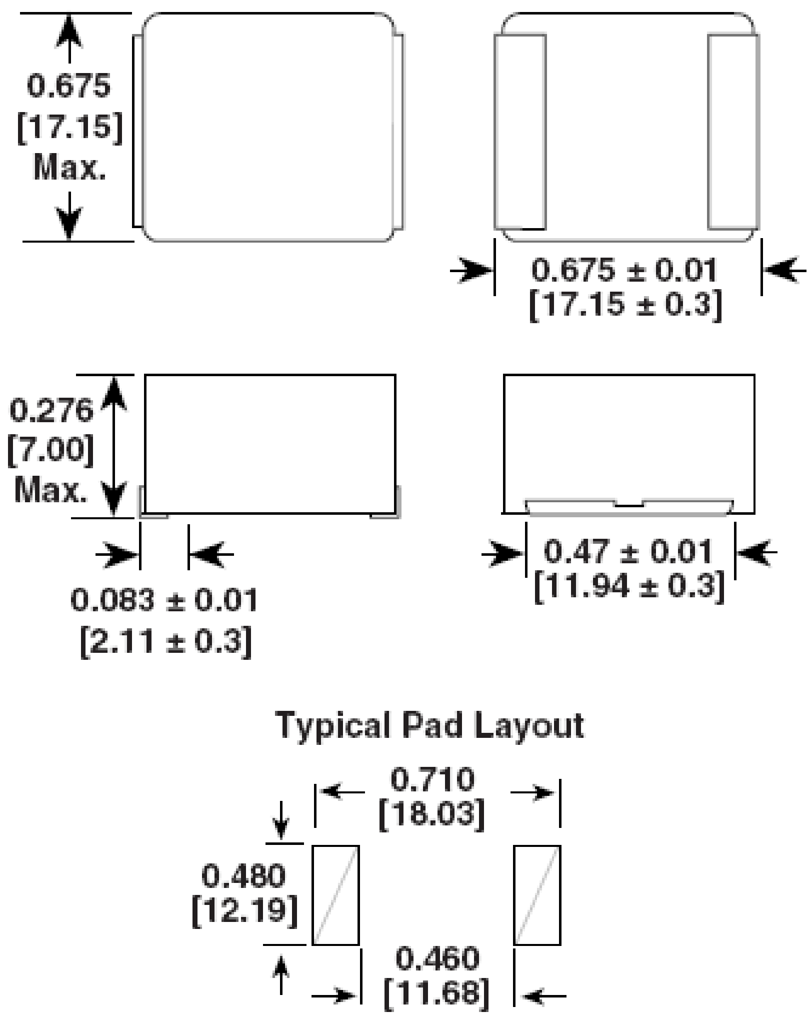
Production Part Approval Process

The following PPAP documentation is assembled according to
AIAG, 4th Edition PPAP Manual and applicable customer requirements

Use the control buttons below to navigate through the PPAP sections.

Section 9: Dimensional Analysis

DIMENSIONS in inches [millimeters]



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Production Part Approval Process

The following PPAP documentation is assembled according to
AIAG, 4th Edition PPAP Manual and applicable customer requirements

Use the control buttons below to navigate through the PPAP sections.

Section 9: Dimensional Analysis

Dimensional Analysis, IHLP6767GZ

Length	Width	Height	Tab Length	Tab Width
.675+/- .010	.675Max	.276Max	.083+/-.01	.47+/- .010
0.6735	0.673	0.274	0.081	0.47
0.6735	0.673	0.273	0.085	0.47
0.6745	0.6735	0.273	0.082	0.47
0.674	0.673	0.272	0.081	0.471
0.674	0.673	0.273	0.082	0.471
0.6745	0.673	0.273	0.082	0.47
0.674	0.673	0.273	0.08	0.471
0.674	0.673	0.2715	0.082	0.47
0.6745	0.673	0.274	0.081	0.47
0.6745	0.673	0.273	0.083	0.47
0.674	0.673	0.273	0.082	0.471
0.6735	0.673	0.273	0.08	0.47
0.674	0.673	0.273	0.082	0.47
0.6745	0.6735	0.273	0.082	0.471
0.6735	0.673	0.273	0.081	0.471
0.6735	0.6735	0.273	0.08	0.471
0.6735	0.6735	0.2735	0.081	0.47
0.6735	0.673	0.273	0.084	0.471
0.6735	0.673	0.272	0.082	0.47
0.6745	0.673	0.273	0.081	0.47
0.674	0.673	0.273	0.081	0.47
0.674	0.673	0.273	0.082	0.471
0.6745	0.6735	0.2735	0.082	0.471
0.674	0.674	0.273	0.085	0.47
0.6745	0.6725	0.273	0.081	0.47
0.6735	0.673	0.273	0.083	0.471
0.674	0.6735	0.273	0.082	0.47
0.674	0.673	0.273	0.083	0.471
0.6745	0.6725	0.273	0.082	0.47
0.6745	0.673	0.273	0.081	0.471
0.6735	0.673	0.2715	0.082	0.471
0.674	0.673	0.273	0.082	0.471
0.674	0.6735	0.273	0.081	0.471
0.6745	0.6735	0.2725	0.085	0.47
0.6735	0.673	0.273	0.082	0.471
0.674	0.673	0.273	0.083	0.471
0.6735	0.673	0.273	0.081	0.47
0.6735	0.673	0.273	0.082	0.47
0.674	0.6735	0.273	0.082	0.47
0.6745	0.673	0.273	0.082	0.471
0.6745	0.673	0.2725	0.081	0.47
0.673	0.673	0.273	0.084	0.471
0.674	0.6735	0.273	0.082	0.47
0.6745	0.673	0.273	0.082	0.47
0.6735	0.673	0.273	0.081	0.47
0.6735	0.6735	0.2735	0.082	0.471
0.674	0.673	0.273	0.081	0.47
0.674	0.6735	0.2735	0.083	0.471
0.6745	0.673	0.272	0.082	0.47
0.674	0.6735	0.274	0.085	0.47

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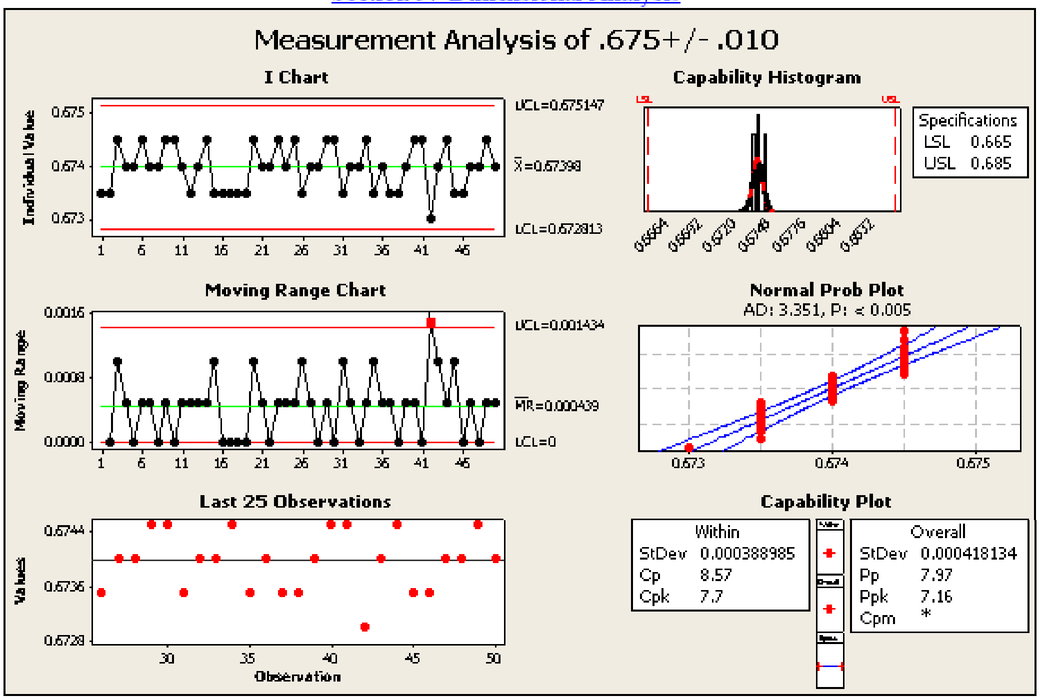
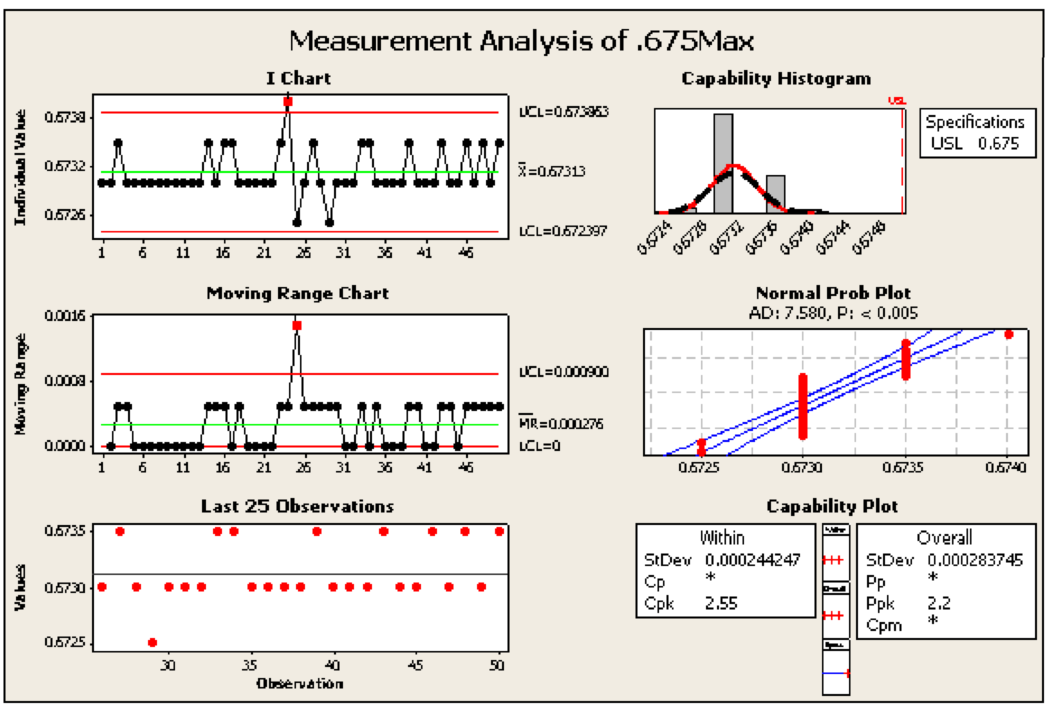
Production Part Approval Process

The following PPAP documentation is assembled according to AIAG, 4th Edition PPAP Manual and applicable customer requirements

Use the control buttons below to navigate through the PPAP sections.

Section 9: Dimensional Analysis





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Production Part Approval Process

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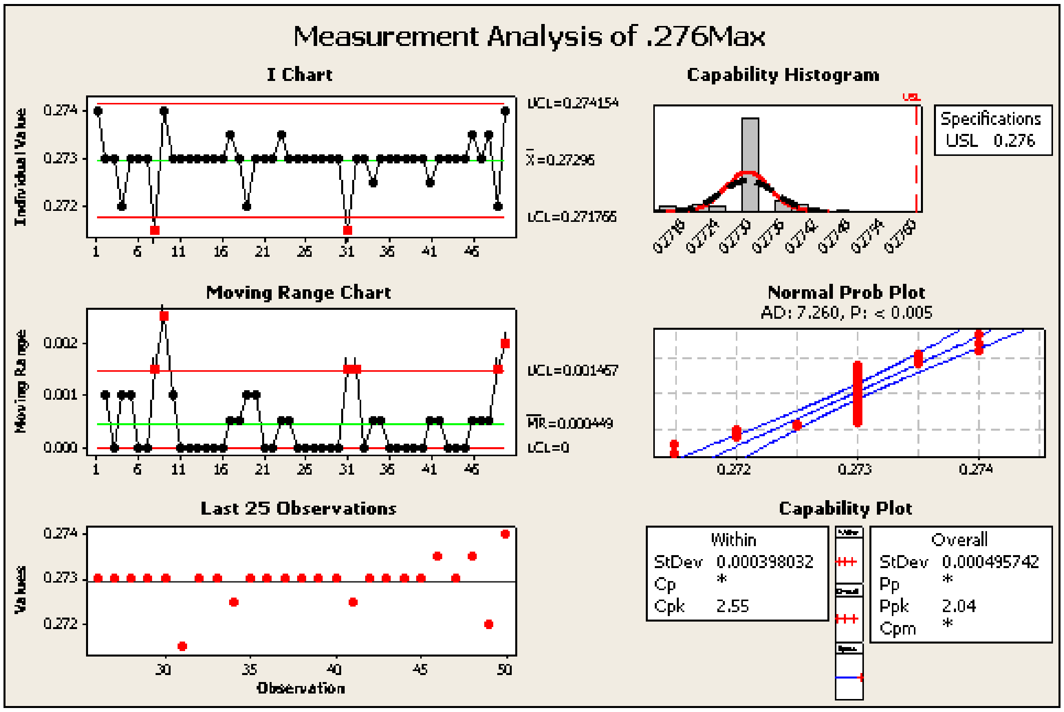
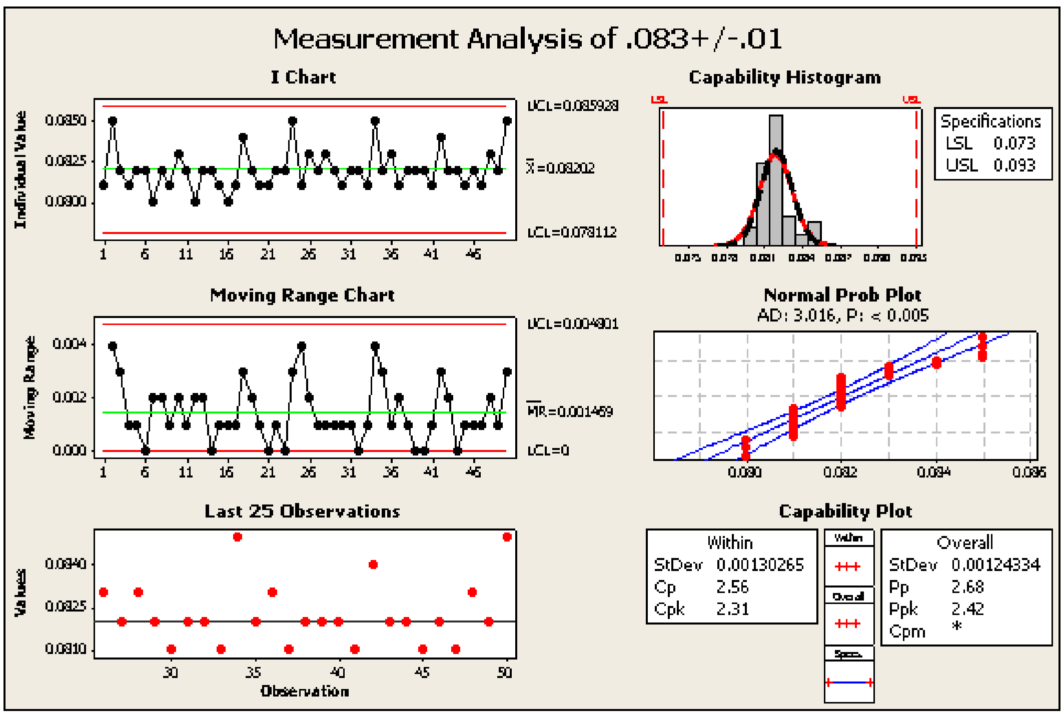
Section 9: Dimensional Analysis





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Production Part Approval Process

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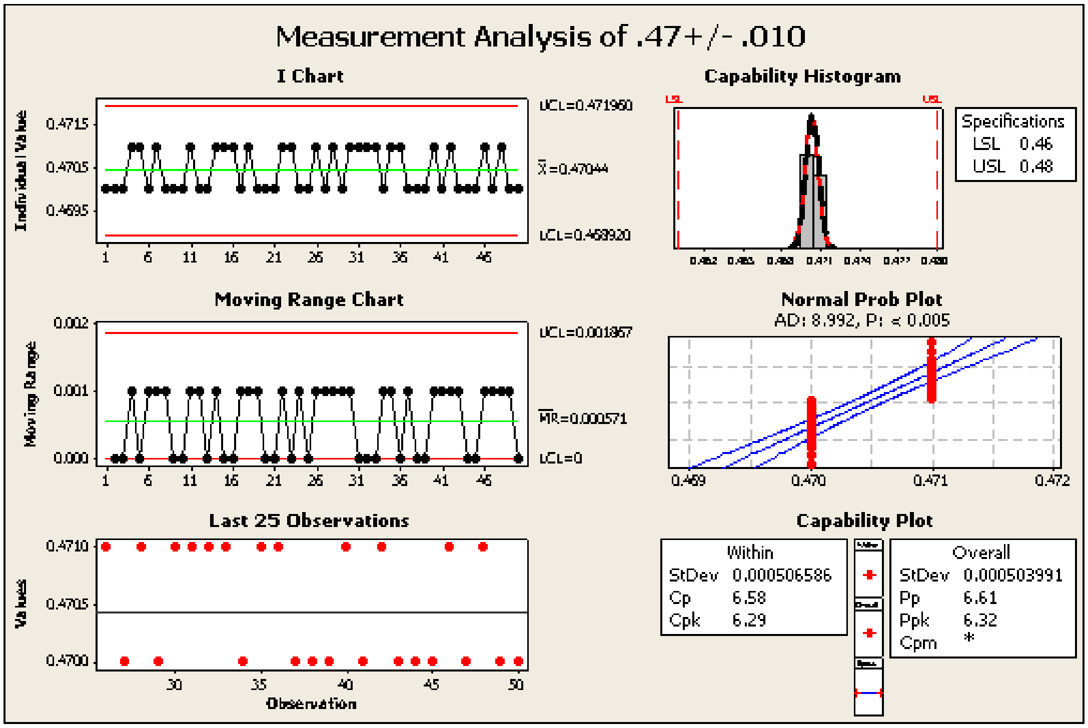
Section 9: Dimensional Analysis



Return to PPAP Requirements

VISHAY

SECTION 10

PERFORMANCE TEST RESULTS
BEER'SHEVA, ISRAEL

A WORLD OF SOLUTIONS

- Parts were built in Beer'Sheva, Israel location

VISHAY®

IHLP6767GZER220M5A TEST RESULTS

Test #	Description	Ref. Spec. Meth / Cond	Test Conditions	End Point Δ requirements	Sample Size	Meas Temp							
0	3x Reflow reconditioning for lead-free products	ICP 10,373	As specified in sections 6.3 thru 6.4 except Visual per DPS-11,865 10X magnification										
1	Pre- and Post-Stress Electrical Test	IHLP Data Sheet	L (uH) – 100KHz and 250mV DCR – 25°C Ambient	L=±15% of initial, DCR =±15% of initial	All tests requiring electrical data								
3	High Temp Exposure	IEC-60068 Part 2-2 test group BA	155C for 2000 hours, unpowered readings at 0, 250, 500, 1000 and 2000 hour intervals. Initial (0 hr.) and final (2000 hr.) readings at LT/RT/HT LT=Low Temperature=-55°C, RT=Room Temperature=+25°C,HT=High Temperature=+125°C for –A1/1A models. HT=High Temperature =+155° C for -5A models.	L=±20% of initial, DCR =±20% of initial	77			Inductance (µH)			DC Resistance (mΩ)		
								Initial	Final	%Δ	Initial	Final	%Δ
						-55 deg. C	Maximum	23.2279	24.2422	6.08024	15.02	15.259	1.5912117
							Mimimum	19.7608	20.923	3.836636	14.753	14.602	-1.2176972
							Mean	21.56067	22.6507	5.071704	14.8534	14.9848	0.8839639
							Std Dev	0.835613	0.79014	0.47203	0.06116	0.0942	0.3739914
						+25 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	23.4033	24.438	6.590	21.84	21.53	-0.416
							Mimimum	19.7908	21.0668	4.038	21.41	19.278	-10.709
							Mean	21.68169	22.8297	5.317	21.5912	20.5509	-4.815
							Std Dev	0.87702	0.80479	0.613	0.07659	0.55978	2.669
						+155 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	23.8141	25.1196	7.546557	32.41	32.42	0.1552313
							Mimimum	20.0506	21.4764	5.162204	31.76	29.95	-6.2010648
							Mean	21.99459	23.4315	6.552676	32.137	32.0864	-0.1579844
							Std Dev	0.922893	0.88061	0.547743	0.13802	0.33096	0.8973981

IHLP6767GZER220M5A TEST RESULTS

								Inductance (µH)			DC Resistance (mΩ)		
								Initial	Final	%Δ	Initial	Final	%Δ
	Low Temperature Storage	EC-60068 Part 2-1 test group Aa	-55°C for 2000 hours unpowered readings at 0, 250, 500, 1000 and 2000 hour intervals. Initial (0 hr.) and final (2000 hr.) readings at LT/RT/H	L=±20% of initial, DCR =±20% of initial	77	-55 deg. C	Maximum	23.0734	23.2753	1.291553	15.1880	15.743	4.272089
							Mimimum	19.4283	19.6784	0.712026	14.7570	14.482	-3.4855048
							Mean	21.6650	21.8819	1.003832	14.8999	15.1376	1.5931282
							Std Dev	0.8757	0.87002	0.123021	0.1057	0.22321	1.0950707
						+25 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	23.2942	23.4882	1.294	21.6200	21.7400	0.695
							Mimimum	19.5289	19.7817	0.629	21.3300	18.7870	-12.619
							Mean	21.8617	22.0471	0.853	21.4553	21.3122	-0.667
							Std Dev	0.9138	0.8962	0.148	0.0705	0.5114	2.360
						+155 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	23.6160	23.6509	0.310652	32.2000	32.29	3.9070068
							Mimimum	19.7153	19.7556	-0.10778	30.9700	31.24	-1.5669069
							Mean	22.1049	22.1405	0.16163	31.9105	31.9175	0.0232381
							Std Dev	0.9480	0.94706	0.090374	0.2120	0.22895	0.5761347

IHLP6767GZER220M5A TEST RESULTS

								Inductance (µH)			DC Resistance (mΩ)		
								Initial	Final	%Δ	Initial	Final	%Δ
4	Temperature Cycling	IEC-60068, Part 2.14 test group Na	-55°C to +125°C (+155° C for -5A models) dwell time = 30 min. transfer time ≤10 sec. no. of cycles = 1000 unpowered initial (0 cycles) and final 1000 cycles). Readings at LT/RT/HT	L=±20% of initial, DCR =±20% of initial	77	-55 deg. C	Maximum	23.1912	23.5934	3.137	15.3160	15.1100	0.013
							Mimimum	19.6294	20.2127	-1.681	14.8310	14.3740	-4.035
							Mean	21.5738	22.0588	2.264	15.0184	14.7718	-1.642
							Std Dev	0.9644	0.9164	0.558	0.1099	0.1706	0.914
						+25 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	23.4838	23.7657	3.306	21.6400	21.6100	0.094
							Mimimum	19.6799	20.2943	-2.168	21.2600	20.3500	-5.217
							Mean	21.7120	22.1878	2.215	21.4600	21.1657	-1.372
							Std Dev	1.0129	0.9328	0.695	0.0714	0.2588	1.122
						+155 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	23.7408	24.2723	3.482	32.2700	31.6500	-0.854
							Mimimum	19.8968	20.5773	-0.488	31.4600	30.2600	-5.450
							Mean	21.9459	22.5608	2.819	31.8291	31.0443	-2.464
							Std Dev	1.0477	1.0026	0.528	0.2041	0.3323	1.007

IHLP6767GZER220M5A TEST RESULTS

								Inductance (µH)			DC Resistance (mΩ)		
								Initial	Final	%Δ	Initial	Final	%Δ
7	Biased Humidity	IEC-60068 Part 2-67	emperature = 85°C ±20°C Humidity = 85% ±5% RH Duration = 1000 hours Pow er = No Pow er Initial (0hr.) and final (1000hr.) readings at LT/RT/HT	L=±20% of initial, DCR =±20% of initial	77	-55 deg. C	Maximum	23.0776	23.3296	1.159	15.7790	15.1880	19.704
							Mimimum	19.7166	19.9019	0.433	12.4190	14.7220	-3.942
							Mean	21.5283	21.7145	0.861	15.1152	14.8973	-1.385
							Std Dev	0.8672	0.8952	0.166	0.3581	0.0949	2.548
						+25 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	23.2873	23.4991	1.335	21.7200	21.9700	3.088
							Mimimum	19.7704	20.0126	0.659	21.0500	21.5700	0.416
							Mean	21.6585	21.8584	0.925	21.5664	21.7709	0.949
							Std Dev	0.9116	0.9105	0.156	0.0900	0.0907	0.394
						+155 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	23.5760	23.6440	0.379	32.5000	32.4900	14.714
							Mimimum	19.9575	20.0208	-0.042	28.0000	31.5000	-1.498
							Mean	21.8837	21.9300	0.211	32.0240	32.1040	0.275
							Std Dev	0.9554	0.9572	0.097	0.5163	0.2207	1.716

IHLP6767GZER220M5A TEST RESULTS

								Inductance (µH)			DC Resistance (mΩ)		
8	Operational Life	MIL-STD-202, Method 108A	Temperature = 85°C for -1A/A1 models. Temperature =115° C for -5A models. Duration = 2000hrs. Pow er = As noted on the test request. Readings a 0, 250, 500, 1000 and 2000 hour intervals. Initial (0 hr.) and final (2000 hr.) readings at LT/RT/HT	L=±20% of initial, DCR =±20% of initial	77			Initial	Final	%Δ	Initial	Final	%Δ
						-55 deg. C	Maximum	23.1129	25.3499	13.85007	15.5870	15.196	1.037234
							Mimimum	19.3911	21.6833	3.535863	14.9110	13.059	-14.423329
							Mean	21.7361	23.7055	9.092964	15.0813	14.7658	-2.0872626
							Std Dev	0.8665	0.88659	2.180455	0.1330	0.35896	2.4123935
						+25 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	23.3205	25.6057	14.525	22.0000	21.6300	0.093
							Mimimum	19.4283	21.8936	4.598	21.4100	20.0400	-8.909
							Mean	21.8416	23.9396	9.645	21.6364	21.2348	-1.852
							Std Dev	0.9036	0.8915	2.174	0.1672	0.2870	1.387
						+155 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	23.6626	26.2492	16.12491	32.5100	32.2700	0.9413
							Mimimum	19.6004	22.306	5.686402	31.4200	29.5100	-7.3469
							Mean	22.0633	24.5077	11.12198	32.0996	31.5568	-1.6898
							Std Dev	0.9532	0.94717	2.217224	0.1905	0.5080	1.5618

VISHAY

IHLP6767GZER220M5A TEST RESULTS

9	External Visual	MIL-STD-883G Method 2009.9	Inspect construction and workmanship.	Pass all criteria as defined in DPS-11,865 VA1	All	na	Pass
10	Physical Dimensions	JESD22 Method JB-100	Verify physical dimensions per part specification	All parts within dimensional tolerance per data sheet	30	na	Pass
12	Resistance to Solvents	MIL-STD-202G Method 215K	Add Aqueous wash chemical. OKEM Clean or equivalent. Do not use banned solvents.	Pass all criteria as defined in DPS-11,865 VA1 L=±20% of initial, DCR =±20% of initial	5	na	Pass

IHLP6767GZER220M5A TEST RESULTS

								Inductance (µH)			DC Resistance (mΩ)		
								Initial	Final	%Δ	Initial	Final	%Δ
13	Mechanical Shock	IEC-60068 part 2.27 test group Ea with precondition per 0 above	Pulse Shape-Half Sine Normal Pulse Length 6ms Peak acceleration-100g No. shocks-6 each in both directions of each axis (total of 36) Initial and final readings at LT/RT/HT	L=±20% of initial, DCR =±20% of initial	30	-55 deg. C	Maximum	22.6671	22.8407	1.424	15.0580	15.1770	1.167
							Mimimum	19.6445	19.9242	0.641	14.8730	14.7950	-0.822
							Mean	21.5066	21.6997	0.902	14.9733	14.9552	-0.121
							Std Dev	0.7940	0.7763	0.147	0.0450	0.1089	0.639
						+25 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	22.8755	23.0848	7.522	21.5900	21.6000	0.140
							Mimimum	19.6852	20.0199	0.745	21.3800	21.3900	0.000
							Mean	21.6313	21.9301	1.398	21.5007	21.5100	0.043
							Std Dev	0.8394	0.7904	1.177	0.0601	0.0575	0.042
						+155 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	23.2970	23.3134	0.397	32.4200	32.2000	0.596
							Mimimum	19.9239	19.9730	0.021	31.8700	31.5700	-1.835
							Mean	21.9154	21.9626	0.216	32.1983	31.9567	-0.748
							Std Dev	0.8738	0.8738	0.094	0.1432	0.1836	0.744

IHLP6767GZER220M5A TEST RESULTS

								Inductance (µH)			DC Resistance (mΩ)		
								Initial	Final	%Δ	Initial	Final	%Δ
14	Vibration	IEC-60068 PART 2-6 TEST GROUP Fc. With precondition per 0 above	Pulse Shape-sine wave range of frequency 1 10-55Hz. Amplitude ±0.75mm Range of frequency 2 55-2000Hz Amplitude; 10G Frequency Sweep: 1 oct./min. Duration: 24 h each of 3 axis. Initial and final readings at LT/RT/HT	L=±20% of initial, DCR =±20% of initial	30	-55 deg. C	Maximum	22.9372	23.0484	1.229	15.3670	15.1960	0.446
							Mimimum	19.6684	19.9102	0.324	14.7720	14.7850	-2.408
							Mean	21.3657	21.5217	0.739	15.0849	14.9646	-0.791
							Std Dev	0.9534	0.9191	0.219	0.1727	0.1147	0.778
						+25 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	23.0878	23.3171	1.547	21.7700	21.5300	0.283
							Mimimum	19.7195	20.0245	0.524	21.2200	21.2800	-1.428
							Mean	21.4757	21.7133	1.116	21.5327	21.4380	-0.437
							Std Dev	0.9959	0.9640	0.236	0.1355	0.0661	0.455
						+155 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	23.4055	23.4492	0.446	32.0700	32.0800	1.436
							Mimimum	19.9178	19.9783	0.001	31.2200	31.2400	-0.697
							Mean	23.4055	21.7719	0.254	31.6647	31.7877	0.389
							Std Dev	19.9178	1.0273	0.100	0.2215	0.2433	0.550

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IHLP6767GZER220M5A TEST RESULTS

								Inductance (µH)			DC Resistance (mΩ)		
	Bump	IEC-60068 part 2-29 test group Eb with precondition per 0 above.	Pulse shape: half sine Nominal pulse length: 6 ms Peak Acceleration: 40g No. of shocks: 4000 each mechanical axis.Initial and final readings at LT/RT/HT	L=±20% of initial, DCR =±20% of initial	30			Initial	Final	%Δ	Initial	Final	%Δ
						-55 deg. C	Maximum	23.0140	23.2118	1.205	15.1550	15.5700	4.154
							Mimimum	19.2306	19.4623	0.432	14.8390	14.8300	-0.581
							Mean	21.7918	21.9646	0.798	14.9462	15.0475	0.679
							Std Dev	0.9493	0.9344	0.180	0.0786	0.2222	1.466
						+25 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	23.2075	23.4329	1.694	21.5800	21.7300	1.028
							Mimimum	19.2798	19.6064	0.732	21.3800	21.4400	0.140
							Mean	21.9283	22.1762	1.137	21.4710	21.5727	0.474
							Std Dev	0.9922	0.9704	0.188	0.0560	0.0742	0.241
						+155 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	23.6187	23.6034	0.389	32.2000	32.1200	-0.187
							Mimimum	19.5300	19.5761	-0.143	31.7400	31.4600	-1.621
							Mean	22.2354	22.2654	0.135	32.0150	31.7653	-0.780
							Std Dev	1.0318	1.0311	0.098	0.1317	0.1786	0.435

IHLP6767GZER220M5A TEST RESULTS

15	Resistance to Solder Heat	MIL-STD-202G Method 210F Condition K	IR/convection reflow. 250 ± 5°C for 30 ± 5sec. Ramp rate 1°C/s to 4°C/; Above 183°C for 90s-120s	L=±20% of initial, DCR =±20% of initial	30			Inductance (µH)			DC Resistance (mΩ)		
								Initial	Final	%Δ	Initial	Final	%Δ
						+25 deg. C	Maximum	23.0540	23.0506	1.642	21.5000	21.5500	0.423
							Mimimum	19.5837	19.8887	-0.015	21.2700	21.2700	-0.188
							Mean	21.6218	21.7463	0.599	21.3927	21.4267	0.159
							Std Dev	1.0790	0.9870	0.484	0.0725	0.0755	0.117
17	ESD	AEC-Q200-002	Determine the Classification of the part.	L=±20% of initial, DCR =±20% of initial	15			Inductance (µH)			DC Resistance (mΩ)		
								Initial	25KV	%Δ	Initial	25KV	%Δ
						+25 deg. C	Maximum	23.9745	23.9906	0.220	21.7	21.58	-0.5092593
							Mimimum	20.0719	20.0401	-0.158	21.47	21.33	-0.6520727
							Mean	22.15745	22.1645	0.031	21.572	21.4493	-0.5686635
							Std Dev	1.16349	1.16771	0.093	0.05833	0.06076	0.0413698
18	Solderability	J-STD-002C Method B1	4 hours @ 155°C dry heat @ 255°C. 90° dipping angle.	95% or greater coverage on "A" (seating plane) per J-STD-002C	15	NA	Pass						

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IHLP6767GZER220M5A TEST RESULTS

								Inductance (µH)			DC Resistance (mΩ)		
19	Electrical Characterization	User Specification	Min, Max, Mean, and Standard Deviation @ Min (-55C), Room, and Max (+125C) operating temperatures. After mounted, allow +/-5% shift DCR at room temp. -55C/+125C DCR Max calculated using temp conversion for copper: $R_2 = [(T_2 + 234.5) / (234.5 + T_A)] * 1.05R_A$ (A = Ambient, 2 = new con)	Final Test: L=±20% of initial, DCR per calculated limits described in test conditions. L test for -55C & +125C = ±20% initial	30			Initial	[redacted]		Initial	[redacted]	
						-55 deg. C	Maximum	23.014			15.1550		
							Mimimum	19.2306			14.8390		
							Mean	21.79183			14.9462		
							Std Dev	0.949315			0.0786		
						+25 deg. C		Initial			Initial		
							Maximum	23.2075			21.5800		
							Mimimum	19.2798			21.3800		
							Mean	21.92832			21.4710		
							Std Dev	0.992231			0.0560		
						+155 deg. C		Initial			Initial		
							Maximum	23.6187			32.2000		
							Mimimum	19.53			31.7400		
							Mean	22.23542			32.0150		
							Std Dev	1.031792			0.1317		
21	Board Flex	AEC-Q200-005 Appendix 2	2mm minimum flex for 60 (+5) sec	Pass all criteria as defined in DPS-11,865 VA1 L=±20% of initial, DCR =±20% of initial	30			Inductance (µH)			DC Resistance (mΩ)		
								Initial	Final	%Δ	Initial	Final	%Δ
						+25 deg. C	Maximum	23.5388	23.6696	1.549921	21.87	22.05	0.8230453
							Mimimum	20.2803	20.4297	0.164416	21.4	21.38	-0.3242242
							Mean	22.23114	22.3528	0.548938	21.551	21.5887	0.1748779
							Std Dev	0.904782	0.90197	0.276588	0.10263	0.11455	0.2721176
22	Terminal Strength	AEC-Q200-006 Appendix 1	Force of 1.8kg (17.7 N) for 60 seconds	Pass all criteria as defined in DPS-11,865 VA1 L=±20% of initial, DCR =±20% of initial	30			Inductance (µH)			DC Resistance (mΩ)		
								Initial	Final	%Δ	Initial	Final	%Δ
						+25 deg. C	Maximum	23.7995	23.723	0.485021	21.76	21.56	-0.7910656
							Mimimum	19.9028	19.9466	-0.32144	21.46	21.26	-1.2465374
							Mean	22.14107	22.1876	0.211293	21.5783	21.364	-0.9931674
							Std Dev	1.073404	1.07181	0.179805	0.06159	0.05787	0.1229601

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SECTION 10

PERFORMANCE TEST RESULTS

DANSHUI, CHINA MANUFACTURING LOCATION

A WORLD OF SOLUTIONS

IHLP6767GZER8R2M5A
IHLP6767GZER220M5A

- Parts were manufactured in Danshui, China location

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IHLP6767GZER8R2M5A

Test #	Description	Ref. Spec. Meth / Cond	Test Conditions	End Point Δ requirements	Sample Size	Meas Temp							
0	3x reflow Preconditioning for lead-free products	ICP 10,373	As specified in sections 6.3 thru 6.4 except Visual per DPS-11,865 10X magnification										
1	Pre- and Post-Stress Electrical Test	IHLP Data Sheet	L (uH) – 100KHz and 250mV DCR – 25°C Ambient	L=±15% of initial, DCR =±15% of initial	All tests requiring electrical data								
3	High Temp Exposure	IEC-60068 Part 2-2 test group BA	155C for 2000 hours, unpowered readings at 0, 250, 500, 1000 and 2000 hour intervals. Initial (0 hr.) and final (2000 hr.) readings at LT/RT/HT LT=Low Temperature=-55ºC, RT=Room Temperature=+25ºC,HT=High Temperature=+125ºC for –A1/1A models. HT=High Temperature =+155° C for -5A models.	L=±20% of initial, DCR =±20% of initial	77			Inductance (µH)			DC Resistance (mΩ)		
								Initial	Final	%Δ	Initial	Final	%Δ
						-55 deg. C	Maximum	8.155	8.577	6.568	6.004	5.836	-0.788
							Mimimum	6.740	7.182	4.938	5.736	5.630	-3.181
							Mean	7.424	7.850	5.756	5.838	5.727	-1.909
							Std Dev	0.372	0.375	0.378	0.057	0.051	0.512
						+25 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	8.198	8.653	7.055	8.522	8.427	-0.513
							Mimimum	6.770	7.246	5.391	8.230	8.126	-1.653
							Mean	7.457	7.918	6.195	8.366	8.269	-1.159
							Std Dev	0.370	0.375	0.382	0.069	0.071	0.262
						+155 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	8.188	8.850	9.037	12.740	12.569	-0.081
							Mimimum	6.781	7.390	7.345	12.234	12.107	-1.596
							Mean	7.472	8.088	8.247	12.495	12.361	-1.067
							Std Dev	0.364	0.385	0.332	0.104	0.109	0.379

IHLP6767GZER8R2M5A

								Inductance (µH)			DC Resistance (mΩ)		
								Initial	Final	%Δ	Initial	Final	%Δ
	Low Temperature Storage	EC-60068 Part 2-1 test group Aa	-55°C for 2000 hours unpowered readings at 0, 250, 500, 1000 and 2000 hour intervals. Initial (0 hr.) and final (2000 hr.) readings at LT/RT/H	L=±20% of initial, DCR =±20% of initial	77	-55 deg. C	Maximum	8.299	8.292	0.607	5.933	5.885	1.014
							Mimimum	6.770	6.807	-0.086	5.716	5.661	-1.802
							Mean	7.457	7.479	0.301	5.826	5.779	-0.803
							Std Dev	0.459	0.451	0.158	0.053	0.052	0.678
						+25 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	8.338	8.327	0.540	8.566	8.497	0.251
							Mimimum	6.799	6.831	-0.130	8.247	8.212	-1.400
							Mean	7.491	7.510	0.264	8.403	8.347	-0.664
							Std Dev	0.455	0.447	0.166	0.072	0.071	0.294
						+155 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	8.319	8.325	0.202	12.782	12.674	0.878
							Mimimum	6.820	6.828	0.063	12.236	12.135	-1.508
							Mean	7.498	7.508	0.129	12.506	12.426	-0.641
							Std Dev	0.436	0.437	0.033	0.122	0.123	0.502

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IHLP6767GZER8R2M5A

No.	Test	Reference	Conditions	Criteria	Qty	Temp.	Statistic	Inductance (µH) Initial	Inductance (µH) Final	Inductance (µH) %Δ	DC Resistance (mΩ) Initial	DC Resistance (mΩ) Final	DC Resistance (mΩ) %Δ
4	Temperature Cycling	IEC-60068, Part 2.14 test group Na	-55°C to +125°C (+155° C for -5A models) dwell time = 30 min. transfer time ≤10 sec. no. of cycles = 1000 unpowered initial (0 cycles) and final 1000 cycles). Readings at LT/RT/HT	L=±20% of initial, DCR =±20% of initial	77	-55 deg. C	Maximum	8.202	8.304	2.075	5.946	5.899	0.068
							Mimimum	6.789	6.929	0.839	5.720	5.674	-2.491
							Mean	7.546	7.656	1.466	5.840	5.787	-0.917
							Std Dev	0.443	0.436	0.256	0.051	0.056	0.616
						+25 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	8.220	8.331	2.253	8.536	8.572	1.248
							Mimimum	6.817	6.971	0.916	8.227	8.208	-0.515
							Mean	7.580	7.698	1.568	8.380	8.414	0.416
							Std Dev	0.440	0.433	0.260	0.072	0.083	0.527
						+155 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	8.191	8.453	3.753	12.740	12.661	0.492
							Mimimum	6.821	7.068	2.493	12.178	12.124	-1.722
							Mean	7.581	7.807	2.969	12.502	12.431	-0.567
							Std Dev	0.420	0.438	0.265	0.129	0.112	0.465

No.	Test	Reference	Conditions	Criteria	Qty	Temp.	Statistic	Inductance (µH) Initial	Inductance (µH) Final	Inductance (µH) %Δ	DC Resistance (mΩ) Initial	DC Resistance (mΩ) Final	DC Resistance (mΩ) %Δ
7	Biased Humidity	IEC-60068 Part 2-67	Temperature = 85°C ±20°C Humidity = 85% ±5% RH Duration = 1000 hours Power = No Power Initial (0hr.) and final (1000hr.) readings at LT/RT/HT	L=±20% of initial, DCR =±20% of initial	77	-55 deg. C	Maximum	8.307	8.313	0.714	5.883	5.886	0.398
							Mimimum	6.794	6.831	-0.163	5.679	5.652	-0.493
							Mean	7.549	7.573	0.322	5.783	5.781	-0.034
							Std Dev	0.459	0.448	0.203	0.050	0.054	0.199
						+25 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	8.338	8.345	0.834	8.513	8.509	0.084
							Mimimum	6.830	6.879	-0.072	8.196	8.156	-0.920
							Mean	7.582	7.616	0.456	8.359	8.345	-0.163
							Std Dev	0.455	0.443	0.217	0.073	0.071	0.199
						+155 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	8.308	8.346	0.670	12.727	12.709	-0.079
							Mimimum	6.853	6.892	0.360	12.226	12.183	-0.773
							Mean	7.585	7.624	0.509	12.486	12.453	-0.262
							Std Dev	0.434	0.433	0.069	0.114	0.115	0.131

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IHLP6767GZER8R2M5A

								Inductance (µH)			DC Resistance (mΩ)		
								Initial	Final	%Δ	Initial	Final	%Δ
8	Operational Life	MIL-STD-202, Method 108A	Temperature = 85°C for -1A/A1 models. Temperature =115° C for -5A models. Duration = 2000hrs. Pow er = As noted on the test request. Readings a 0, 250, 500, 1000 and 2000 hour intervals. Initial (0 hr.) and final (2000 hr.) readings at LT/RT/HT	L=±20% of initial, DCR =±20% of initial	77	-55 deg. C	Maximum	8.513	8.804	5.294	5.985	5.932	1.298
							Mimimum	6.853	7.139	2.504	5.721	5.690	-3.395
							Mean	7.542	7.826	3.767	5.840	5.787	-0.899
							Std Dev	0.503	0.511	0.610	0.061	0.056	0.885
						+25 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	8.545	8.902	5.919	8.648	8.511	1.154
							Mimimum	6.888	7.220	3.231	8.259	8.196	-2.161
							Mean	7.576	7.909	4.409	8.421	8.350	-0.846
							Std Dev	0.500	0.511	0.597	0.090	0.075	0.540
						+155 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	8.498	9.064	7.783	12.770	12.612	2.039
							Mimimum	6.920	7.350	4.079	12.152	12.057	-2.547
							Mean	7.591	8.041	5.921	12.500	12.361	-1.105
							Std Dev	0.481	0.521	0.801	0.129	0.118	0.825
9	External Visual	MIL-STD-883G Method 2009.9	Inspect construction and workmanship.	Pass all criteria as defined in DPS-11,865 VA1	All	na	Pass						
10	Physical Dimensions	JESD22 Method JB-100	Verify physical dimensions per part specification	All parts within dimensional tolerance per data sheet	30	na	Pass						
12	Resistance to Solvents	MIL-STD-202G Method 215K	Add Aqueous wash chemical. OKEM Clean or equivalent. Do not use banned solvents.	Pass all criteria as defined in DPS-11,865 VA1 L=±20% of initial, DCR =±20% of initial	5	na	Pass						

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IHLP6767GZER8R2M5A

No.	Test	Reference	Conditions	Limits	Qty	Temperature	Statistic	Inductance (µH) Initial	Inductance (µH) Final	Inductance (µH) %Δ	DC Resistance (mΩ) Initial	DC Resistance (mΩ) Final	DC Resistance (mΩ) %Δ
13	Mechanical Shock	IEC-60068 part 2.27 test group Ea with precondition per 0 above	Pulse Shape-Half Sine Normal Pulse Length 6ms Peak acceleration-100g No. shocks-6 each in both directions of each axis (total of 36) Initial and final readings at LT/RT/HT	L=±20% of initial, DCR =±20% of initial	30	-55 deg. C	Maximum	7.689	7.714	0.551	5.897	5.914	0.391
							Mimimum	6.832	6.855	0.322	5.668	5.678	0.121
							Mean	7.198	7.227	0.407	5.770	5.785	0.268
							Std Dev	0.229	0.229	0.053	0.058	0.058	0.073
						+25 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	7.734	7.757	0.531	8.413	8.411	0.012
							Mimimum	6.862	6.884	0.296	8.179	8.173	-0.326
							Mean	7.234	7.262	0.385	8.297	8.291	-0.075
							Std Dev	0.231	0.231	0.058	0.062	0.062	0.067
						+155 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	7.764	7.776	0.237	12.478	12.476	0.073
							Mimimum	6.868	6.882	0.150	12.188	12.180	-0.106
							Mean	7.250	7.263	0.186	12.320	12.315	-0.037
							Std Dev	0.232	0.232	0.019	0.090	0.092	0.044

No.	Test	Reference	Conditions	Limits	Qty	Temperature	Statistic	Inductance (µH) Initial	Inductance (µH) Final	Inductance (µH) %Δ	DC Resistance (mΩ) Initial	DC Resistance (mΩ) Final	DC Resistance (mΩ) %Δ
14	Vibration	IEC-60068 PART 2-6 TEST GROUP Fc. With precondition per 0 above	Pulse Shape-sine wave range of frequency 1 10-55Hz. Amplitude ±0.75mm Range of frequency 2 55-2000Hz Amplitude; 10G Frequency Sweep: 1 oct./min. Duration: 24 h each of 3 axis. Initial and final readings at LT/RT/HT	L=±20% of initial, DCR =±20% of initial	30	-55 deg. C	Maximum	7.739	7.767	0.563	5.947	5.853	1.528
							Mimimum	6.826	6.860	0.165	5.668	5.660	-3.514
							Mean	7.296	7.326	0.413	5.774	5.762	-0.209
							Std Dev	0.245	0.245	0.109	0.064	0.053	1.122
						+25 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	7.780	7.806	0.523	8.411	8.406	0.482
							Mimimum	6.851	6.880	0.122	8.192	8.177	-0.214
							Mean	7.330	7.356	0.362	8.295	8.296	0.006
							Std Dev	0.249	0.246	0.086	0.061	0.061	0.180
						+155 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	7.800	7.813	0.236	12.524	12.515	0.121
							Mimimum	6.865	6.875	0.138	12.197	12.193	-0.868
							Mean	7.344	7.357	0.172	12.366	12.343	-0.184
							Std Dev	0.248	0.248	0.027	0.091	0.095	0.289

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								Inductance (µH)			DC Resistance (mΩ)		
								Initial	Final	%Δ	Initial	Final	%Δ
	Bump	IEC-60068 part 2-29 test group Eb with precondition per 0 above.	Pulse shape: half sine Nominal pulse length: 6 ms Peak Acceleration: 40g No. of shocks: 4000 each mechanical axis.Initial and final readings at LT/RT/HT	L=±20% of initial, DCR =±20% of initial	30	-55 deg. C	Maximum	7.701	7.730	0.620	5.874	5.871	0.158
							Mimimum	6.728	6.759	0.231	5.670	5.672	-0.209
							Mean	7.242	7.272	0.416	5.742	5.743	0.021
							Std Dev	0.301	0.300	0.080	0.053	0.051	0.077
						+25 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	7.741	7.773	0.703	8.379	8.392	0.278
							Mimimum	6.753	6.789	0.368	8.183	8.193	0.048
							Mean	7.275	7.311	0.491	8.273	8.286	0.146
							Std Dev	0.303	0.302	0.085	0.057	0.057	0.058
						+155 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	7.750	7.761	0.364	12.443	12.463	0.244
							Mimimum	6.766	6.771	0.068	12.144	12.159	-0.294
							Mean	7.293	7.305	0.164	12.314	12.330	0.128
							Std Dev	0.301	0.302	0.066	0.083	0.085	0.095
								Inductance (µH)			DC Resistance (mΩ)		
								Initial	Final	%Δ	Initial	Final	%Δ
15	Resistance to Solder Heat	MIL-STD-202G Method 210F Condition K	IR/convection reflow. 250 ± 5°C for 30 ± 5sec. Ramp rate 1°C/s to 4°C/; Above 183°C for 90s-120s	L=±20% of initial, DCR =±20% of initial	30	+25 deg. C	Maximum	7.722	7.629	-0.311	8.400	8.397	0.036
							Mimimum	6.684	6.655	-1.480	8.197	8.187	-0.228
							Mean	7.207	7.135	-0.980	8.301	8.295	-0.072
							Std Dev	0.294	0.278	0.327	0.052	0.052	0.062
								Inductance (µH)			DC Resistance (mΩ)		
								Initial	25KV	%Δ	Initial	25KV	%Δ
17	ESD	AEC-Q200-002	Determine the Classification of the part.	L=±20% of initial, DCR =±20% of initial	15	+25 deg. C	Maximum	7.945	8.003	0.918	8.377	8.364	-0.072
							Mimimum	7.078	7.124	0.534	8.283	8.270	-0.311
							Mean	7.479	7.534	0.739	8.331	8.318	-0.154
							Std Dev	0.260	0.261	0.109	0.026	0.025	0.057
18	Solderability	J-STD-002C Method B1	4 hours @ 155°C dry heat @ 255°C. 90° dipping angle.	95% or greater coverage on "A" (seating plane) per J-STD-002C	15	NA	Pass						

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								Inductance (µH)			DC Resistance (mΩ)		
19	Electrical Characterization	User Specification	Min, Max, Mean, and Standard Deviation @ Min (-55C), Room, and Max (+125C) operating temperatures. After mounted, allow +/-5% shift DCR at room temp. -55C/+125C DCR Max calculated using temp conversion for copper: $R_2 = [(T_2 + 234.5) / (234.5 + T_A)] * 1.05R_A$ (A = Ambient, 2 = new con)	Final Test: L=±20% of initial, DCR per calculated limits described in test conditions. L test for -55C & +125C = ±20% initial	30			Initial	[redacted]		Initial	[redacted]	
						-55 deg. C	Maximum	7.701	[redacted]		5.874	[redacted]	
							Mimimum	6.728	[redacted]		5.670	[redacted]	
							Mean	7.242	[redacted]		5.742	[redacted]	
							Std Dev	0.301	[redacted]		0.053	[redacted]	
						+25 deg. C		Initial	[redacted]		Initial	[redacted]	
							Maximum	7.741	[redacted]		8.379	[redacted]	
							Mimimum	6.753	[redacted]		8.183	[redacted]	
							Mean	7.275	[redacted]		8.273	[redacted]	
							Std Dev	0.303	[redacted]		0.057	[redacted]	
						+155 deg. C		Initial	[redacted]		Initial	[redacted]	
							Maximum	7.750	[redacted]		12.443	[redacted]	
							Mimimum	6.766	[redacted]		12.144	[redacted]	
							Mean	7.293	[redacted]		12.314	[redacted]	
							Std Dev	0.301	[redacted]		0.083	[redacted]	
21	Board Flex	AEC-Q200-005 Appendix 2	2mm minimum flex for 60 (+5) sec	Pass all criteria as defined in DPS-11,865 VA1 L=±20% of initial, DCR =±20% of initial	30			Inductance (µH)			DC Resistance (mΩ)		
								Initial	Final	%Δ	Initial	Final	%Δ
						+25 deg. C	Maximum	8.179	8.200	0.330	8.474	8.481	0.264
							Mimimum	6.697	6.711	0.014	8.212	8.225	0.083
							Mean	7.361	7.376	0.207	8.338	8.351	0.155
							Std Dev	0.420	0.421	0.074	0.068	0.068	0.038
22	Terminal Strength	AEC-Q200-006 Appendix 1	Force of 1.8kg (17.7 N) for 60 seconds	Pass all criteria as defined in DPS-11,865 VA1 L=±20% of initial, DCR =±20% of initial	30			Inductance (µH)			DC Resistance (mΩ)		
								Initial	Final	%Δ	Initial	Final	%Δ
						+25 deg. C	Maximum	7.901	7.927	0.345	8.383	8.383	0.253
							Mimimum	6.855	6.876	-0.331	8.249	8.256	-0.072
							Mean	7.412	7.421	0.125	8.309	8.314	0.058
							Std Dev	0.275	0.274	0.174	0.034	0.033	0.087

IHLP6767GZER220M5A TEST RESULTS

Test #	Description	Ref. Spec. Meth / Cond	Test Conditions	End Point Δ requirements	Sample Size	Meas Temp							
0	3x Reflow Preconditioning for lead-free products	ICP 10,373	As specified in sections 6.3 thru 6.4 except Visual per DPS-11,865 10X magnification										
1	Pre- and Post-Stress Electrical Test	IHLP Data Sheet	L (uH) – 100KHz and 250mV DCR – 25°C Ambient	L=±15% of initial, DCR =±15% of initial	All tests requiring electrical data								
3	High Temp Exposure	IEC-60068 Part 2-2 test group BA	155C for 2000 hours, unpowered readings at 0, 250, 500, 1000 and 2000 hour intervals. Initial (0 hr.) and final (2000 hr.) readings at LT/RT/HT LT=Low Temperature=-55ºC, RT=Room Temperature=+25ºC,HT= High Temperature=+125ºC for –A1/1A models. HT=High Temperature =+155° C for -5A models.	L=±20% of initial, DCR =±20% of initial	77			Inductance (µH)			DC Resistance (mΩ)		
								Initial	Final	%Δ	Initial	Final	%Δ
						-55 deg. C	Maximum	23.2279	24.2422	6.08024	15.02	15.259	1.5912117
							Mimimum	19.7608	20.923	3.836636	14.753	14.602	-1.2176972
							Mean	21.56067	22.6507	5.071704	14.8534	14.9848	0.8839639
							Std Dev	0.835613	0.79014	0.47203	0.06116	0.0942	0.3739914
						+25 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	23.4033	24.438	6.590	21.84	21.53	-0.416
							Mimimum	19.7908	21.0668	4.038	21.41	19.278	-10.709
							Mean	21.68169	22.8297	5.317	21.5912	20.5509	-4.815
							Std Dev	0.87702	0.80479	0.613	0.07659	0.55978	2.669
						+155 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	23.8141	25.1196	7.546557	32.41	32.42	0.1552313
							Mimimum	20.0506	21.4764	5.162204	31.76	29.95	-6.2010648
							Mean	21.99459	23.4315	6.552676	32.137	32.0864	-0.1579844
							Std Dev	0.922893	0.88061	0.547743	0.13802	0.33096	0.8973981

IHLP6767GZER220M5A TEST RESULTS

								Inductance (µH)			DC Resistance (mΩ)		
								Initial	Final	%Δ	Initial	Final	%Δ
	Low Temperature Storage	EC-60068 Part 2-1 test group Aa	-55°C for 2000 hours unpowered readings at 0, 250, 500, 1000 and 2000 hour intervals. Initial (0 hr.) and final (2000 hr.) readings at LT/RT/H	L=±20% of initial, DCR =±20% of initial	77	-55 deg. C	Maximum	23.0734	23.2753	1.291553	15.1880	15.743	4.272089
							Mimimum	19.4283	19.6784	0.712026	14.7570	14.482	-3.4855048
							Mean	21.6650	21.8819	1.003832	14.8999	15.1376	1.5931282
							Std Dev	0.8757	0.87002	0.123021	0.1057	0.22321	1.0950707
						+25 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	23.2942	23.4882	1.294	21.6200	21.7400	0.695
							Mimimum	19.5289	19.7817	0.629	21.3300	18.7870	-12.619
							Mean	21.8617	22.0471	0.853	21.4553	21.3122	-0.667
							Std Dev	0.9138	0.8962	0.148	0.0705	0.5114	2.360
						+155 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	23.6160	23.6509	0.310652	32.2000	32.29	3.9070068
							Mimimum	19.7153	19.7556	-0.10778	30.9700	31.24	-1.5669069
							Mean	22.1049	22.1405	0.16163	31.9105	31.9175	0.0232381
							Std Dev	0.9480	0.94706	0.090374	0.2120	0.22895	0.5761347

IHLP6767GZER220M5A TEST RESULTS

								Inductance (µH)			DC Resistance (mΩ)		
								Initial	Final	%Δ	Initial	Final	%Δ
4	Temperature Cycling	IEC-60068, Part 2.14 test group Na	-55°C to +125°C (+155° C for -5A models) dwell time = 30 min. transfer time ≤10 sec. no. of cycles = 1000 unpowered initial (0 cycles) and final 1000 cycles). Readings at LT/RT/HT	L=±20% of initial, DCR =±20% of initial	77	-55 deg. C	Maximum	23.1912	23.5934	3.137	15.3160	15.1100	0.013
							Mimimum	19.6294	20.2127	-1.681	14.8310	14.3740	-4.035
							Mean	21.5738	22.0588	2.264	15.0184	14.7718	-1.642
							Std Dev	0.9644	0.9164	0.558	0.1099	0.1706	0.914
						+25 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	23.4838	23.7657	3.306	21.6400	21.6100	0.094
							Mimimum	19.6799	20.2943	-2.168	21.2600	20.3500	-5.217
							Mean	21.7120	22.1878	2.215	21.4600	21.1657	-1.372
							Std Dev	1.0129	0.9328	0.695	0.0714	0.2588	1.122
						+155 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	23.7408	24.2723	3.482	32.2700	31.6500	-0.854
							Mimimum	19.8968	20.5773	-0.488	31.4600	30.2600	-5.450
							Mean	21.9459	22.5608	2.819	31.8291	31.0443	-2.464
							Std Dev	1.0477	1.0026	0.528	0.2041	0.3323	1.007

IHLP6767GZER220M5A TEST RESULTS

								Inductance (µH)			DC Resistance (mΩ)		
								Initial	Final	%Δ	Initial	Final	%Δ
7	Biased Humidity	IEC-60068 Part 2-67	emperature = 85°C ±20°C Humidity = 85% ±5% RH Duration = 1000 hours Pow er = No Pow er Initial (0hr.) and final (1000hr.) readings at LT/RT/HT	L=±20% of initial, DCR =±20% of initial	77	-55 deg. C	Maximum	23.0776	23.3296	1.159	15.7790	15.1880	19.704
							Mimimum	19.7166	19.9019	0.433	12.4190	14.7220	-3.942
							Mean	21.5283	21.7145	0.861	15.1152	14.8973	-1.385
							Std Dev	0.8672	0.8952	0.166	0.3581	0.0949	2.548
						+25 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	23.2873	23.4991	1.335	21.7200	21.9700	3.088
							Mimimum	19.7704	20.0126	0.659	21.0500	21.5700	0.416
							Mean	21.6585	21.8584	0.925	21.5664	21.7709	0.949
							Std Dev	0.9116	0.9105	0.156	0.0900	0.0907	0.394
						+155 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	23.5760	23.6440	0.379	32.5000	32.4900	14.714
							Mimimum	19.9575	20.0208	-0.042	28.0000	31.5000	-1.498
							Mean	21.8837	21.9300	0.211	32.0240	32.1040	0.275
							Std Dev	0.9554	0.9572	0.097	0.5163	0.2207	1.716

IHLP6767GZER220M5A TEST RESULTS

								Inductance (µH)			DC Resistance (mΩ)		
								Initial	Final	%Δ	Initial	Final	%Δ
8	Operational Life	MIL-STD-202, Method 108A	Temperature = 85°C for -1A/A1 models. Temperature =115° C for -5A models. Duration = 2000hrs. Pow er = As noted on the test request. Readings a 0, 250, 500, 1000 and 2000 hour intervals. Initial (0 hr.) and final (2000 hr.) readings at LT/RT/HT	L=±20% of initial, DCR =±20% of initial	77	-55 deg. C	Maximum	23.1129	25.3499	13.85007	15.5870	15.196	1.037234
						-55 deg. C	Mimimum	19.3911	21.6833	3.535863	14.9110	13.059	-14.423329
						-55 deg. C	Mean	21.7361	23.7055	9.092964	15.0813	14.7658	-2.0872626
						-55 deg. C	Std Dev	0.8665	0.88659	2.180455	0.1330	0.35896	2.4123935
						+25 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
						+25 deg. C	Maximum	23.3205	25.6057	14.525	22.0000	21.6300	0.093
						+25 deg. C	Mimimum	19.4283	21.8936	4.598	21.4100	20.0400	-8.909
						+25 deg. C	Mean	21.8416	23.9396	9.645	21.6364	21.2348	-1.852
						+25 deg. C	Std Dev	0.9036	0.8915	2.174	0.1672	0.2870	1.387
						+155 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
						+155 deg. C	Maximum	23.6626	26.2492	16.12491	32.5100	32.2700	0.9413
						+155 deg. C	Mimimum	19.6004	22.306	5.686402	31.4200	29.5100	-7.3469
						+155 deg. C	Mean	22.0633	24.5077	11.12198	32.0996	31.5568	-1.6898
						+155 deg. C	Std Dev	0.9532	0.94717	2.217224	0.1905	0.5080	1.5618

IHLP6767GZER220M5A TEST RESULTS

9	External Visual	MIL-STD-883G Method 2009.9	Inspect construction and workmanship.	Pass all criteria as defined in DPS-11,865 VA1	All	na	Pass
10	Physical Dimensions	JESD22 Method JB-100	Verify physical dimensions per part specification	All parts within dimensional tolerance per data sheet	30	na	Pass
12	Resistance to Solvents	MIL-STD-202G Method 215K	Add Aqueous wash chemical. OKEM Clean or equivalent. Do not use banned solvents.	Pass all criteria as defined in DPS-11,865 VA1 L=±20% of initial, DCR =±20% of initial	5	na	Pass

IHLP6767GZER220M5A TEST RESULTS

								Inductance (µH)			DC Resistance (mΩ)		
								Initial	Final	%Δ	Initial	Final	%Δ
13	Mechanical Shock	IEC-60068 part 2.27 test group Ea with precondition per 0 above	Pulse Shape-Half Sine Normal Pulse Length 6ms Peak acceleration-100g No. shocks-6 each in both directions of each axis (total of 36) Initial and final readings at LT/RT/HT	L=±20% of initial, DCR =±20% of initial	30	-55 deg. C	Maximum	22.6671	22.8407	1.424	15.0580	15.1770	1.167
							Mimimum	19.6445	19.9242	0.641	14.8730	14.7950	-0.822
							Mean	21.5066	21.6997	0.902	14.9733	14.9552	-0.121
							Std Dev	0.7940	0.7763	0.147	0.0450	0.1089	0.639
						+25 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	22.8755	23.0848	7.522	21.5900	21.6000	0.140
							Mimimum	19.6852	20.0199	0.745	21.3800	21.3900	0.000
							Mean	21.6313	21.9301	1.398	21.5007	21.5100	0.043
							Std Dev	0.8394	0.7904	1.177	0.0601	0.0575	0.042
						+155 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	23.2970	23.3134	0.397	32.4200	32.2000	0.596
							Mimimum	19.9239	19.9730	0.021	31.8700	31.5700	-1.835
							Mean	21.9154	21.9626	0.216	32.1983	31.9567	-0.748
							Std Dev	0.8738	0.8738	0.094	0.1432	0.1836	0.744

IHLP6767GZER220M5A TEST RESULTS

								Inductance (µH)			DC Resistance (mΩ)		
								Initial	Final	%Δ	Initial	Final	%Δ
14	Vibration	IEC-60068 PART 2-6 TEST GROUP Fc. With precondition per 0 above	Pulse Shape-sine wave range of frequency 1 10-55Hz. Amplitude ±0.75mm Range of frequency 2 55-2000Hz Amplitude; 10G Frequency Sweep: 1 oct./min. Duration: 24 h each of 3 axis. Initial and final readings at LT/RT/HT	L=±20% of initial, DCR =±20% of initial	30	-55 deg. C	Maximum	22.9372	23.0484	1.229	15.3670	15.1960	0.446
							Mimimum	19.6684	19.9102	0.324	14.7720	14.7850	-2.408
							Mean	21.3657	21.5217	0.739	15.0849	14.9646	-0.791
							Std Dev	0.9534	0.9191	0.219	0.1727	0.1147	0.778
						+25 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	23.0878	23.3171	1.547	21.7700	21.5300	0.283
							Mimimum	19.7195	20.0245	0.524	21.2200	21.2800	-1.428
							Mean	21.4757	21.7133	1.116	21.5327	21.4380	-0.437
							Std Dev	0.9959	0.9640	0.236	0.1355	0.0661	0.455
						+155 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	23.4055	23.4492	0.446	32.0700	32.0800	1.436
							Mimimum	19.9178	19.9783	0.001	31.2200	31.2400	-0.697
							Mean	23.4055	21.7719	0.254	31.6647	31.7877	0.389
							Std Dev	19.9178	1.0273	0.100	0.2215	0.2433	0.550

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IHLP6767GZER220M5A TEST RESULTS

								Inductance (µH)			DC Resistance (mΩ)		
								Initial	Final	%Δ	Initial	Final	%Δ
	Bump	IEC-60068 part 2-29 test group Eb with precondition per 0 above.	Pulse shape: half sine Nominal pulse length: 6 ms Peak Acceleration: 40g No. of shocks: 4000 each mechanical axis.Initial and final readings at LT/RT/HT	L=±20% of initial, DCR =±20% of initial	30	-55 deg. C	Maximum	23.0140	23.2118	1.205	15.1550	15.5700	4.154
							Mimimum	19.2306	19.4623	0.432	14.8390	14.8300	-0.581
							Mean	21.7918	21.9646	0.798	14.9462	15.0475	0.679
							Std Dev	0.9493	0.9344	0.180	0.0786	0.2222	1.466
						+25 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	23.2075	23.4329	1.694	21.5800	21.7300	1.028
							Mimimum	19.2798	19.6064	0.732	21.3800	21.4400	0.140
							Mean	21.9283	22.1762	1.137	21.4710	21.5727	0.474
							Std Dev	0.9922	0.9704	0.188	0.0560	0.0742	0.241
						+155 deg. C		Initial	Final	%Δ	Initial	Final	%Δ
							Maximum	23.6187	23.6034	0.389	32.2000	32.1200	-0.187
							Mimimum	19.5300	19.5761	-0.143	31.7400	31.4600	-1.621
							Mean	22.2354	22.2654	0.135	32.0150	31.7653	-0.780
							Std Dev	1.0318	1.0311	0.098	0.1317	0.1786	0.435

IHLP6767GZER220M5A TEST RESULTS

								Inductance (µH)			DC Resistance (mΩ)		
								Initial	Final	%Δ	Initial	Final	%Δ
15	Resistance to Solder Heat	MIL-STD-202G Method 210F Condition K	IR/convection reflow. 250 ± 5°C for 30 ± 5sec. Ramp rate 1°C/s to 4°C/; Above 183°C for 90s-120s	L=±20% of initial, DCR =±20% of initial	30	+25 deg. C	Maximum	23.0540	23.0506	1.642	21.5000	21.5500	0.423
							Mimimum	19.5837	19.8887	-0.015	21.2700	21.2700	-0.188
							Mean	21.6218	21.7463	0.599	21.3927	21.4267	0.159
							Std Dev	1.0790	0.9870	0.484	0.0725	0.0755	0.117
								Inductance (µH)			DC Resistance (mΩ)		
								Initial	25KV	%Δ	Initial	25KV	%Δ
17	ESD	AEC-Q200-002	Determine the Classification of the part.	L=±20% of initial, DCR =±20% of initial	15	+25 deg. C	Maximum	23.9745	23.9906	0.220	21.7	21.58	-0.5092593
							Mimimum	20.0719	20.0401	-0.158	21.47	21.33	-0.6520727
							Mean	22.15745	22.1645	0.031	21.572	21.4493	-0.5686635
							Std Dev	1.16349	1.16771	0.093	0.05833	0.06076	0.0413698
18	Solderability	J-STD-002C Method B1	4 hours @ 155°C dry heat @ 255°C. 90° dipping angle.	95% or greater coverage on "A" (seating plane) per J-STD-002C	15	NA	Pass						

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IHLP6767GZER220M5A TEST RESULTS

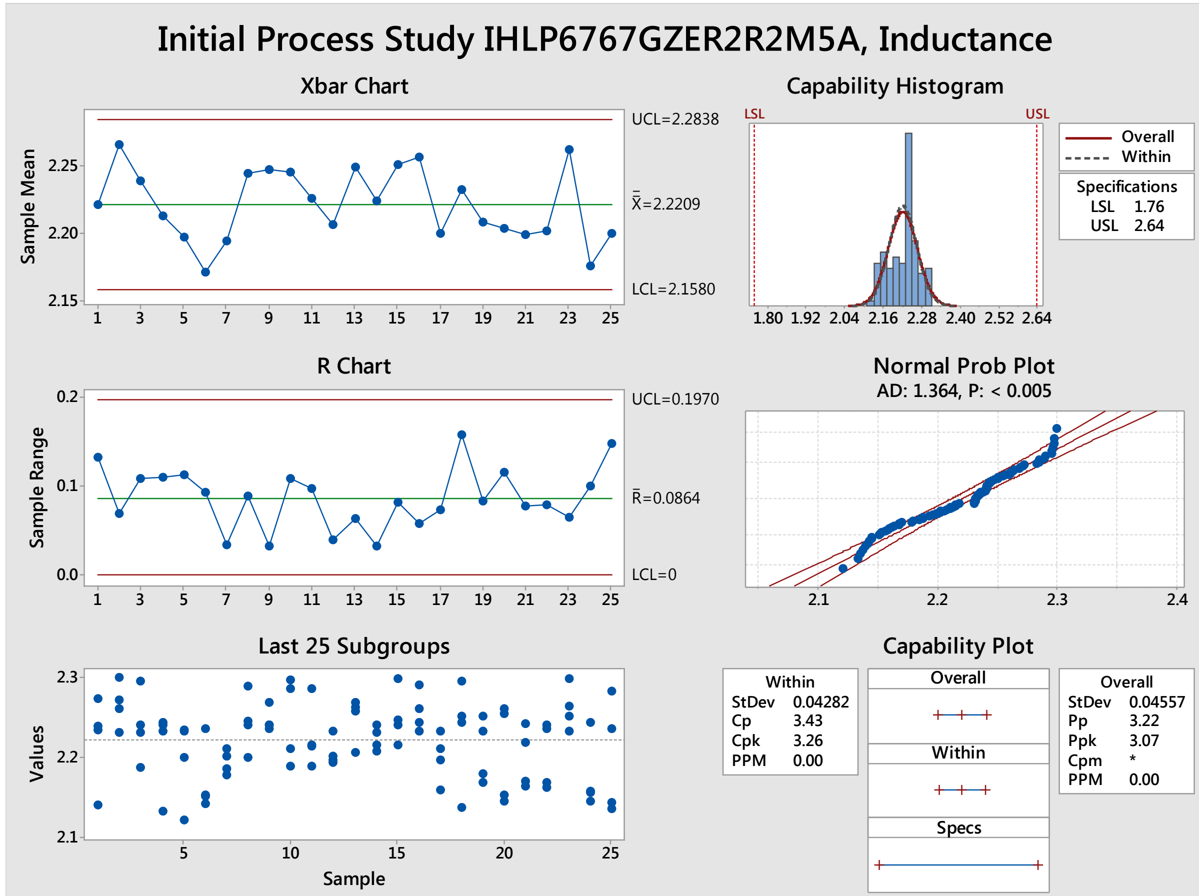
19	Electrical Characterization	User Specification	Min, Max, Mean, and Standard Deviation @ Min (-55C), Room, and Max (+125C) operating temperatures. After mounted, allow +/-5% shift DCR at room temp. -55C/+125C DCR Max calculated using temp conversion for copper: $R_2 = [(T_2 + 234.5) / (234.5 + T_A)] * 1.05R_A$ (A = Ambient, 2 = new con)	Final Test: L=±20% of initial, DCR per calculated limits described in test conditions. L test for -55C & +125C = ±20% initial	30			Inductance (µH)			DC Resistance (mΩ)		
								Initial	[redacted]	[redacted]	Initial	[redacted]	[redacted]
						-55 deg. C	Maximum	23.014	[redacted]	[redacted]	15.1550	[redacted]	[redacted]
							Mimimum	19.2306	[redacted]	[redacted]	14.8390	[redacted]	[redacted]
							Mean	21.79183	[redacted]	[redacted]	14.9462	[redacted]	[redacted]
							Std Dev	0.949315	[redacted]	[redacted]	0.0786	[redacted]	[redacted]
						+25 deg. C		Initial	[redacted]	[redacted]	Initial	[redacted]	[redacted]
							Maximum	23.2075	[redacted]	[redacted]	21.5800	[redacted]	[redacted]
							Mimimum	19.2798	[redacted]	[redacted]	21.3800	[redacted]	[redacted]
							Mean	21.92832	[redacted]	[redacted]	21.4710	[redacted]	[redacted]
							Std Dev	0.992231	[redacted]	[redacted]	0.0560	[redacted]	[redacted]
						+155 deg. C		Initial	[redacted]	[redacted]	Initial	[redacted]	[redacted]
							Maximum	23.6187	[redacted]	[redacted]	32.2000	[redacted]	[redacted]
							Mimimum	19.53	[redacted]	[redacted]	31.7400	[redacted]	[redacted]
							Mean	22.23542	[redacted]	[redacted]	32.0150	[redacted]	[redacted]
							Std Dev	1.031792	[redacted]	[redacted]	0.1317	[redacted]	[redacted]
21	Board Flex	AEC-Q200-005 Appendix 2	2mm minimum flex for 60 (+5) sec	Pass all criteria as defined in DPS-11,865 VA1 L=±20% of initial, DCR =±20% of initial	30			Inductance (µH)			DC Resistance (mΩ)		
								Initial	Final	%Δ	Initial	Final	%Δ
						+25 deg. C	Maximum	23.5388	23.6696	1.549921	21.87	22.05	0.8230453
							Mimimum	20.2803	20.4297	0.164416	21.4	21.38	-0.3242242
							Mean	22.23114	22.3528	0.548938	21.551	21.5887	0.1748779
							Std Dev	0.904782	0.90197	0.276588	0.10263	0.11455	0.2721176
22	Terminal Strength	AEC-Q200-006 Appendix 1	Force of 1.8kg (17.7 N) for 60 seconds	Pass all criteria as defined in DPS-11,865 VA1 L=±20% of initial, DCR =±20% of initial	30			Inductance (µH)			DC Resistance (mΩ)		
								Initial	Final	%Δ	Initial	Final	%Δ
						+25 deg. C	Maximum	23.7995	23.723	0.485021	21.76	21.56	-0.7910656
							Mimimum	19.9028	19.9466	-0.32144	21.46	21.26	-1.2465374
							Mean	22.14107	22.1876	0.211293	21.5783	21.364	-0.9931674
							Std Dev	1.073404	1.07181	0.179805	0.06159	0.05787	0.1229601

Production Part Approval Process

The following PPAP documentation is assembled according to AIAG, 4th Edition PPAP Manual and applicable customer requirements

Initial Process Study
IHLP6767GZER2R2M5A, Inductance

Inductance (uH)							
1	2.140	26	2.178	51	2.263	76	2.233
2	2.273	27	2.211	52	2.269	77	2.255
3	2.234	28	2.185	53	2.240	78	2.145
4	2.238	29	2.245	54	2.231	79	2.261
5	2.271	30	2.200	55	2.215	80	2.152
6	2.260	31	2.241	56	2.208	81	2.170
7	2.300	32	2.289	57	2.240	82	2.242
8	2.231	33	2.241	58	2.298	83	2.164
9	2.187	34	2.268	59	2.216	84	2.218
10	2.241	35	2.236	60	2.247	85	2.162
11	2.231	36	2.241	61	2.290	86	2.241
12	2.295	37	2.188	62	2.243	87	2.236
13	2.133	38	2.297	63	2.232	88	2.168
14	2.240	39	2.285	64	2.261	89	2.251
15	2.232	40	2.210	65	2.232	90	2.298
16	2.243	41	2.215	66	2.211	91	2.233
17	2.199	42	2.188	67	2.197	92	2.264
18	2.234	43	2.285	68	2.159	93	2.244
19	2.232	44	2.213	69	2.243	94	2.145
20	2.121	45	2.232	70	2.137	95	2.156
21	2.142	46	2.193	71	2.251	96	2.158
22	2.153	47	2.202	72	2.295	97	2.135
23	2.151	48	2.196	73	2.251	98	2.283
24	2.235	49	2.206	74	2.168	99	2.143
25	2.202	50	2.257	75	2.179	100	2.236



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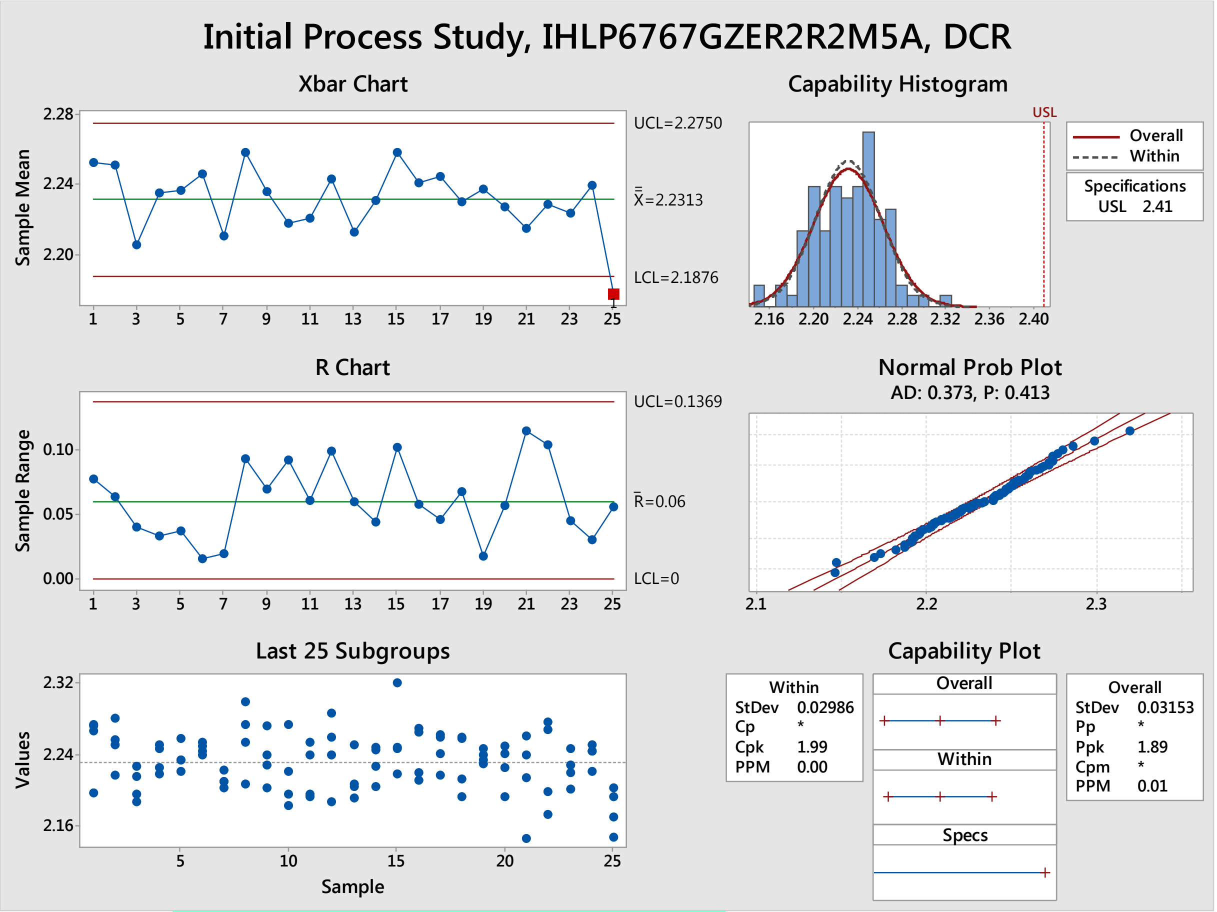
Production Part Approval Process

The following PPAP documentation is assembled according to AIAG, 4th Edition PPAP Manual and applicable customer requirements

Initial Process Study
IHLP6767GZER2R2M5A, DC Resistance

DCR (mOhm)							
1	2.272	26	2.203	51	2.206	76	2.230
2	2.197	27	2.222	52	2.191	77	2.225
3	2.274	28	2.209	53	2.245	78	2.193
4	2.267	29	2.299	54	2.226	79	2.241
5	2.280	30	2.274	55	2.204	80	2.250
6	2.216	31	2.253	56	2.248	81	2.146
7	2.251	32	2.206	57	2.218	82	2.239
8	2.257	33	2.203	58	2.320	83	2.214
9	2.187	34	2.228	59	2.248	84	2.261
10	2.227	35	2.272	60	2.247	85	2.198
11	2.195	36	2.240	61	2.211	86	2.277
12	2.215	37	2.221	62	2.220	87	2.268
13	2.225	38	2.182	63	2.265	88	2.173
14	2.246	39	2.274	64	2.269	89	2.219
15	2.251	40	2.196	65	2.260	90	2.201
16	2.218	41	2.193	66	2.241	91	2.246
17	2.221	42	2.196	67	2.216	92	2.228
18	2.258	43	2.239	68	2.262	93	2.243
19	2.234	44	2.254	69	2.192	94	2.221
20	2.234	45	2.240	70	2.258	95	2.244
21	2.239	46	2.187	71	2.213	96	2.251
22	2.254	47	2.286	72	2.259	97	2.169
23	2.243	48	2.260	73	2.247	98	2.192
24	2.249	49	2.204	74	2.239	99	2.147
25	2.209	50	2.251	75	2.233	100	2.203



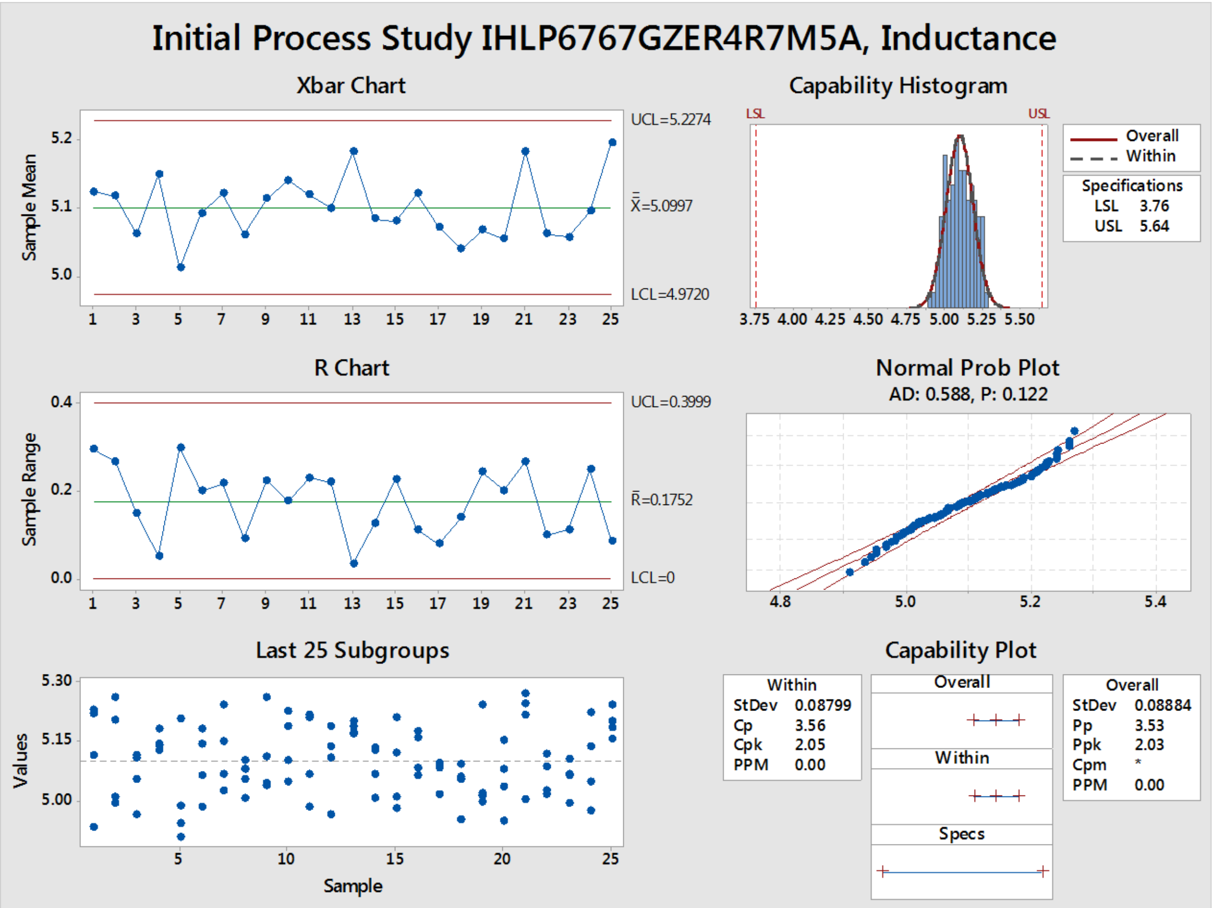
Return to PPAP summary

Production Part Approval Process

The following PPAP documentation is assembled according to AIAG, 4th Edition PPAP Manual and applicable customer requirements

Initial Process Study
IHLP6767GZER4R7M5A, Inductance

Inductance (uH)							
1	5.113	26	5.024	51	5.2	76	4.998
2	5.227	27	5.149	52	5.171	77	4.951
3	5.219	28	5.068	53	5.132	78	5.08
4	4.933	29	5.078	54	5.128	79	5.034
5	5.202	30	5.008	55	5.067	80	5.151
6	5.261	31	5.1	56	5.008	81	5.215
7	5.01	32	5.055	57	5.119	82	5.002
8	4.994	33	5.037	58	4.982	83	5.243
9	5.114	34	5.044	59	5.011	84	5.269
10	4.967	35	5.261	60	5.209	85	5.027
11	5.109	36	5.111	61	5.083	86	5.085
12	5.055	37	5.186	62	5.159	87	5.116
13	5.143	38	5.224	63	5.175	88	5.017
14	5.128	39	5.048	64	5.063	89	5.067
15	5.141	40	5.1	65	5.089	90	5.105
16	5.18	41	5.214	66	5.084	91	4.993
17	5.206	42	5.067	67	5.017	92	5.064
18	4.908	43	5.209	68	5.095	93	4.975
19	4.989	44	4.984	69	5.054	94	5.135
20	4.943	45	5.187	70	5.091	95	5.223
21	4.983	46	5.135	71	5.061	96	5.047
22	5.062	47	4.967	72	4.952	97	5.199
23	5.182	48	5.109	73	5.24	98	5.155
24	5.142	49	5.188	74	5.019	99	5.241
25	5.24	50	5.168	75	5.012	100	5.185

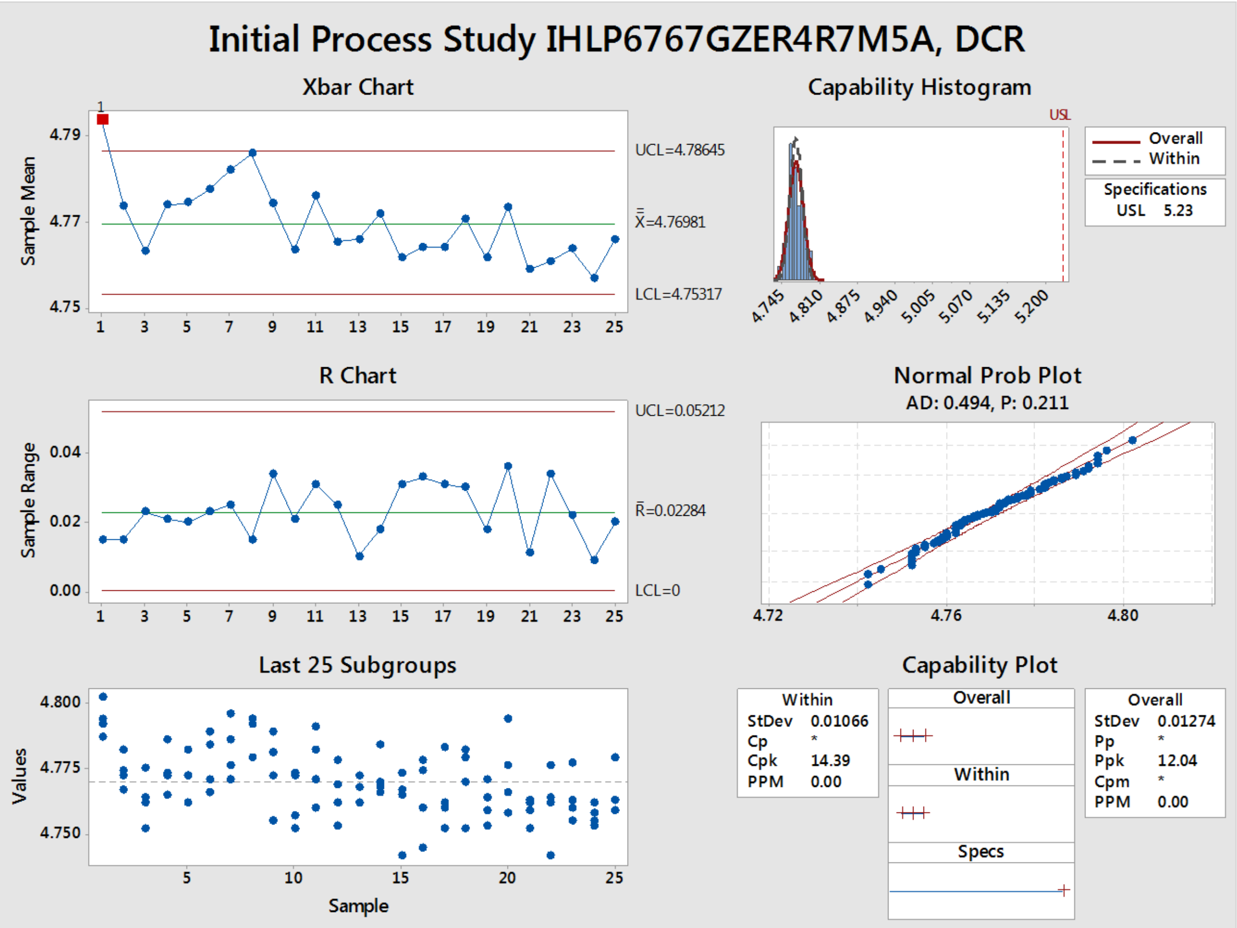


Production Part Approval Process

The following PPAP documentation is assembled according to AIAG, 4th Edition PPAP Manual and applicable customer requirements

Initial Process Study
IHLP6767GZER4R7M5A, DC Resistance

DCR (mOhm)							
1	4.792	26	4.771	51	4.768	76	4.753
2	4.802	27	4.776	52	4.772	77	4.776
3	4.794	28	4.786	53	4.766	78	4.758
4	4.787	29	4.794	54	4.784	79	4.794
5	4.767	30	4.779	55	4.768	80	4.766
6	4.782	31	4.779	56	4.77	81	4.759
7	4.772	32	4.792	57	4.765	82	4.762
8	4.774	33	4.755	58	4.767	83	4.752
9	4.762	34	4.772	59	4.773	84	4.763
10	4.752	35	4.789	60	4.742	85	4.764
11	4.764	36	4.781	61	4.745	86	4.776
12	4.775	37	4.773	62	4.774	87	4.742
13	4.773	38	4.757	63	4.778	88	4.762
14	4.772	39	4.752	64	4.76	89	4.763
15	4.765	40	4.772	65	4.752	90	4.76
16	4.786	41	4.76	66	4.783	91	4.777
17	4.782	42	4.771	67	4.76	92	4.755
18	4.782	43	4.782	68	4.762	93	4.753
19	4.772	44	4.791	69	4.782	94	4.762
20	4.762	45	4.762	70	4.77	95	4.755
21	4.766	46	4.753	71	4.752	96	4.758
22	4.771	47	4.769	72	4.779	97	4.763
23	4.789	48	4.778	73	4.771	98	4.763
24	4.784	49	4.762	74	4.759	99	4.779
25	4.796	50	4.762	75	4.764	100	4.759



Production Part Approval Process

The following PPAP documentation is assembled according to AIAG, 4th Edition PPAP Manual and applicable customer requirements

Use the control buttons below to navigate through the PPAP sections.

Section 12: Qualified Laboratories

Beer Sheva Israel ISO/TS16949 Certification

Yankton SD ISO/TS16949 Certification

Columbus NE Test Lab ISO:TS-16949 Certification

Danshui China ISO:TS-16949 Certification

Return to PPAP Requirements

Vishay / Dale Electronics
1505 East Hway 50 Yankton, SD 57078, USA Phone (605) 665-9301 Fax (605) 668-4247

ONE OF THE WORLD'S LARGEST MANUFACTURERS OF DISCRETE SEMICONDUCTORS AND PASSIVE COMPONENTS

Production Part Approval Process

The following PPAP documentation is assembled according to AIAG, 4th Edition PPAP Manual and applicable customer requirements

Use the control buttons below to navigate through the PPAP sections.

Section 13: Appearance Approval Report

Inductors, like many other electronic components are specified for their electrical properties. There are no specific requirements stated for the physical appearance of inductors, e.g. color of inductors. Therefore, the Appearance Approval Report does not apply in this case.

Return to PPAP Requirements

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Production Part Approval Process

The following PPAP documentation is assembled according to AIAG, 4th Edition PPAP Manual and applicable customer requirements

Use the control buttons below to navigate through the PPAP sections.

Section 14: Sample Product

Sample product from the Vishay Manufacturing Facility is available upon request

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Production Part Approval Process

The following PPAP documentation is assembled according to AIAG, 4th Edition PPAP Manual and applicable customer requirements

Use the control buttons below to navigate through the PPAP sections.

Section 15: Master Sample

Master Sample(s) will be retained at the Vishay Manufacturing Facility with a copy of the PPAP

Return to PPAP Requirements

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Production Part Approval Process

The following PPAP documentation is assembled according to AIAG, 4th Edition PPAP Manual and applicable customer requirements

Use the control buttons below to navigate through the PPAP sections.

Section 16: Checking Aids

Checking Aids are not required for this electronic component

Return to PPAP Requirements

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Production Part Approval Process

The following PPAP documentation is assembled according to AIAG, 4th Edition PPAP Manual and applicable customer requirements

Use the control buttons below to navigate through the PPAP sections.

Section 17: Records of Compliance

Moisture Sensitivity Level: 1

Return to PPAP Requirements

Production Part Approval Process

The following PPAP documentation is assembled according to AIAG, 4th Edition PPAP Manual and applicable customer requirements

Use the control buttons below to navigate through the PPAP sections.

Section 19: Bulk Material Requirements

Bulk Material Requirements do not apply to this Electronic Component.

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VISHAY DALE

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Magnetics

Application Note

IHLP Standards of Manufacture

IHLP INTRODUCTION SURFACE IRREGULARITIES CRITERIA FOR REJECTION SUMMARY

INTRODUCTION

Scope

This document was written for the purpose of helping customers better understand the product they are purchasing. It will give the customer an idea as to the type of cosmetic irregularities that may occur from time to time during the manufacture of the component itself or during customer use of the component.

This document also discusses the criteria that have been developed for rejection of irregularities that are determined to be excessive.

While it would be desirable to have cosmetically perfect IHLP inductors, the powdered iron manufacturing technique has cosmetic limitations.

Certified test labs have performed extensive environmental testing on IHLP's with and without cosmetic imperfections according to AEC-Q200 standards for such tests as thermal shock, mechanical shock, vibration, humidity and others. This testing has shown that the cosmetic imperfections listed in this document do not affect the performance or reliability of the IHLP inductor. Test results are available upon request.

Product

The IHLP inductor is unique from most inductors. The inductor body is a soft magnetic composite (SMC), not a ferrite. It is made from an iron powder mixture and cemented together using a resin binder. This powder mixture, when pressed around the inductor coil, greatly enhances the electrical properties of the inductor and gives protection from environmental forces. After pressing, the component is cured in an oven to increase the bonding strength of the resin binders with the iron powder, yielding excellent electrical and physical properties.

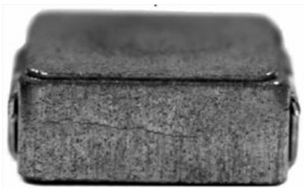
The IHLP inductor provides the best combination of:

- Inductance
- Low Core Loss
- Saturation
- Temperature Stability
- Smallest Footprint
- Lowest Profile

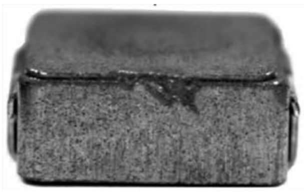
Surface irregularities

The following pages include descriptions of the most common irregularities seen on IHLP inductors. Common causes are described along with variations in their magnitude. Customers may at some time see one or all of these irregularities.

Those that are determined to adversely affect the customer's use of the component are rejected, but minor (acceptable) irregularities will occasionally be present. With the use of this guide, a customer will better understand the effect of each irregularity.



Cracks



Chips

Oxidation

APPLICATION NOTE

For technical questions, contact: magnetics@vishay.com

Next Page

IHLP Standards of Manufacture

CRACKS

Cracks within the inductor body are unavoidable during the manufacturing process. Small cracks are caused by die wall friction when the parts are ejected during the pressing process and by expansion of the coil during the process of curing the resin binder in the powdered iron body. Unlike ferrite material, cracks on the IHLP body do not affect the electrical performance of the component.

Reliability testing has shown that even cracks in excess of 0.005" will not cause the component to fail electrically or physically in field application. Acceptance widths are adopted based on the ability to detect cracks both at the component and circuit level.

Terminal area crack, acceptable

Cracks coming from the top corner of the terminal are a normal occurrence and are caused by terminal expansion during curing operations.

Negligible crack, acceptable

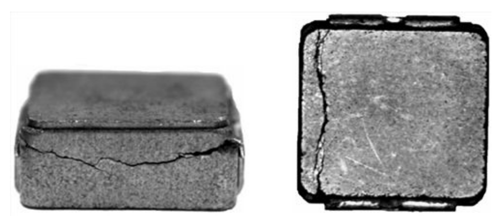
Negligible cracks are those that are nearly invisible without magnification.

Minor crack, acceptable

Minor cracks are those that are visible without magnification but are not apparent without close inspection.

Moderate crack, rejectable

Moderate cracks are those that are obvious upon examination and continue across most of the component.



Major crack, rejectable

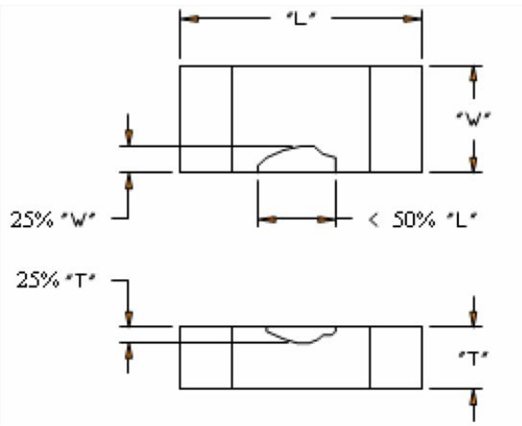
Major cracks are those that are obvious to a customer and would possibly result in large chip-outs that would expose the coil and lead frame.

Next Page

IHLP Standards of Manufacture

CHIPS

Chipping of the inductor body can occur during normal processing and testing of the inductor. The acceptance criteria for chipping vary with the size of the component, but current acceptance standards are based on IPCA-610. The effect of chipping is negligible as long as the inductor coil is not showing. See IPC standard for class 1 and 2 components below.

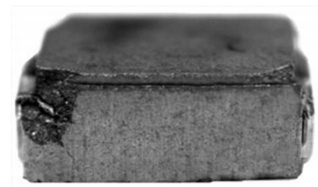


T	25 % of the thickness
W	25 % of the width
L	50 % of the length

Chips typically occur on the edges and corners of the inductor body. They are slightly darker in color and rougher in appearance than the surrounding material.

Minor chipping, acceptable

Minor chips in the inductor body are those that are typically shallow imperfections that occur on the corners and edge of components. No coil wire or lead frame is showing and the chip does not affect the performance or reliability of the component.



Major chipping, rejectable

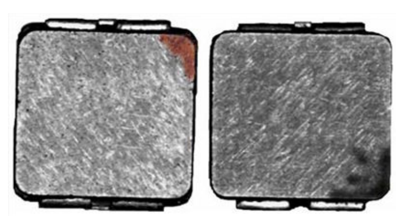
Major chips in the inductor body are those that are very obvious to the customer and may expose the wire coil or lead frame.

OXIDATION

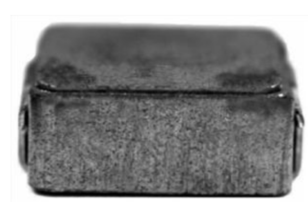
The IHLP inductor is predominately iron and oxidation may occur in a small percentage of the inductors. Resin binders give moderate protection, but some slight oxidation may occur. All components should be stored away from heat, humidity and ionized atmospheres as much as possible before mounting.

Basic steps should be taken in order to limit surface oxidation, including keeping the IHLP inductors sealed in their packaging until PCB mounting.

In the case that oxidation does occur, the effects are contained to the surface of the component and do not penetrate into the core material. No electrical effects have ever been documented due to oxidation of the IHLP product. Oxidation should never be considered a reliability risk.



Top view



Side view

IHLP Standards of Manufacture

OTHER

A very small number of other irregularities have been reported. These occur at an exceedingly low rate and typically do not affect the components electrically. These include:

Foreign material may be seen pressed into the upper terminals. This material is of the same material as the inductor body and should not be a reason for rejection unless solderability is affected.

Foreign material: Acceptable

Scratches may be seen on the surface of the inductor body. Scratches are an acceptable surface irregularity.

Scratch: Acceptable

SUMMARY

The IHLP inductor is comprised of an iron powder body compressed around a coil. Due to the fact that this iron powder body is not solid like ferrite material, irregularities such as cracks and chips do not affect the electrical properties, or the reliability of the component. Criteria have been determined for the acceptability of the components that allow for a robust manufacturing process as well as an acceptable degree of cosmetic irregularity.

Reliability testing has been done on the effects of cracking of the iron powder body and on the oxidation of the iron particles that are present on the surface. Testing has shown no reliability issues from either of these cosmetic differences.

Return to Design Records

Instructions

ASSEMBLY INSTRUCTIONS

General

This document provides instructions on mounting for the different types of packages, specifically on the different methods of soldering.

If the device is to be mounted near heat-generating components, consideration must be given to the resultant increase in ambient temperature.

Soldering Instructions

Protection against overheating is essential when a device is being soldered. Therefore, the PCB traces should be left as long as possible. The maximum permissible soldering temperature is governed by the maximum permissible heat that may be applied to the package.

The maximum soldering iron (or solder bath) temperatures are given in the individual Datasheets. During soldering, no forces must be transmitted from the pins to the case (e.g., by spreading the pins).

Soldering Methods

There are several methods for soldering devices onto the substrate. The following list is not complete.

a. Soldering in the Vapor Phase
   Soldering in saturated vapor is also known as condensation soldering. This soldering process is used as a batch system (dual vapor system) or as a continuous single vapor system. Both systems may also include a pre-heating of the assemblies to prevent high temperature shock and other undesired effects.

b. Infrared Soldering
   By using infrared (IR) reflow soldering, the heating is contact-free and the energy for heating the assembly is derived from direct infrared radiation and from convection.

   The heating rate in an IR furnace depends on the absorption coefficients of the material surfaces and on the ratio of component's mass to an As-irradiated surface.

   The temperature of parts in an IR furnace, with a mixture of radiation and convection, cannot be determined in advance. Temperature measurement may be performed by measuring the temperature of a certain component while it is being transported through the furnace.

   The temperatures of small components, soldered together with larger ones, may rise up to 280 °C.

   Influencing parameters on the internal temperature of the component are as follows:

   - Time and power
   - Mass of the component
   - Size of the component
   - Size of the printed circuit board
   - Absorption coefficient of the surfaces
   - Packing density
   - Wavelength spectrum of the radiation source
   - Ratio of radiated and convected energy

   As a general rule of thumb, maximum temperature should be reached within 360 s and time above solder liquids temperature should be reached in less than 180 s.

   Temperature/time profiles of the entire process and the influencing parameters are given. The IR reflow profile is shown in Figure 1.

c. Wave Soldering
   In wave soldering one or more continuously replenished waves of molten solder are generated, while the substrates to be soldered are moved in one direction across the crest of the wave. Maximum soldering temperature should not exceed 260 °C for 20 s.

d. Iron Soldering
   This process cannot be carried out in a controlled situation. It should therefore not be used in applications where reliability is important. There is no SMD classification for this process.

CLEANING INSTRUCTIONS

A no clean solder system is recommended for IHLP's.
If cleaning must be performed, an Isopropyl alcohol is recommended. If de-ionized Water Wash is used insure it is followed by a thorough warm air dry cycle to avoid oxidation.

Some cleaning solutions, especially those containing non-linear alcohol will attack the IHLP and should be avoided. It is recommended that any chemical cleaning solution be thoroughly rinsed with clean water. The IHLP should be tested for compatibility with any cleaning solution before production assembly.

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TYPICAL REFLOW SOLDERING PROFILE

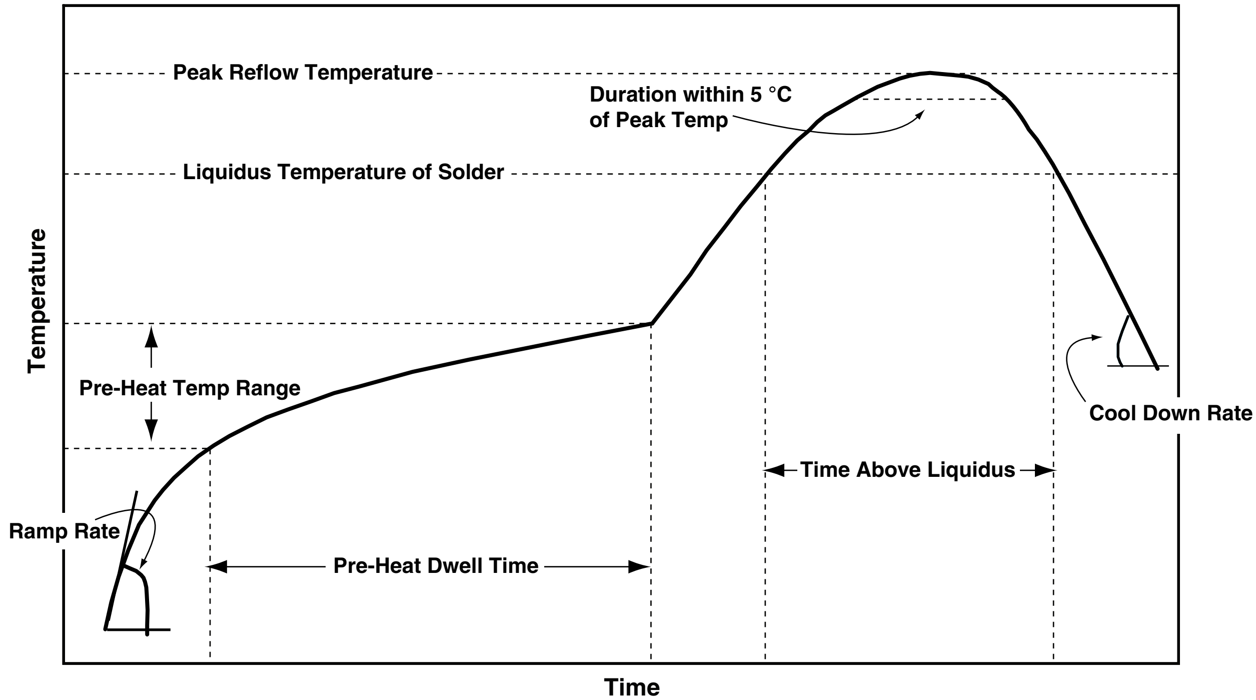

Fig. 1 - Infrared reflow soldering (SMD package)

LEAD (Pb)-FREE SOLDER (SnAgCu) REFLOW PROFILE ATTRIBUTES	
PROFILE ATTRIBUTE	**PROFILE ATTRIBUTE**
Peak Reflow Temperature	255 (± 5) °C
Time within 5 °C of Peak Temperature	30 s max.
Liquidus Temperature of Solder	~ 217 °C
Cool Down Rate	6 °C/s max.
Time above Liquidus	60 s to 150 s
Pre-heat Temperature Range	150 °C to 200 °C
Pre-heat Dwell Time	60 s to 120 s
Maximum Ramp Rate	3 °C/s max.

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