

# Space Grade Surface-Mount Common Mode Choke



## ABSOLUTE MAXIMUM RATINGS

PARAMETER	CONDITIONS	LIMITS	UNITS
Dielectric withstand voltage (DWW) <sup>(1)</sup>	Windings to windings, windings to core	1000	V <sub>RMS</sub>
Insulation resistance (IR) <sup>(2)</sup>	Windings to windings and core, 10 GΩ min.	500	V <sub>DC</sub>
Operating temperature	Continuous	-55 to +130	°C
Storage temperature	Continuous	-65 to +155	°C
Maximum weight		5.5	g

### Notes

- <sup>(1)</sup> Test conditions adjusted per MIL-STD-981 and MIL-PRF-27 4.7.9.1 during group A and B testing, applies to all external materials
- <sup>(2)</sup> Test conditions adjusted per MIL-STD-981 and MIL-PRF-27 4.7.11 during group A and B testing, applies to all external materials

## FEATURES

- Nanocrystalline based design
- Self-shielded
- Molded construction for ruggedized applications
- MIL-PRF-27 grade 5, product level T, temperature class S
- MIL-STD-981 family 04 power inductor, class S compliant <sup>(1)(2)</sup>
- ASTM-E595 outgassing compliant <sup>(3)</sup>
- Tin-lead terminations; does not contain tin composition percentages greater than 97 %
- Broadband frequency response
- Customization available (e.g., turns count, wire gauge, temperature class, screening, etc.)

### Notes

- <sup>(1)</sup> Screening codes S and B only
- <sup>(2)</sup> Clarifications to MIL-STD-981 (1):
  - a. MIL-STD-981 figures 3b, c, and d do not apply to this assembly's build construction
  - b. Corona discharge is not applicable
- <sup>(3)</sup> Applies to all external materials

## APPLICATIONS

- GaN and SiC switching devices
- Low profile, high current power supplies
- DC/DC converters in distributed power systems
- Power converter for solar panels
- Noise suppression

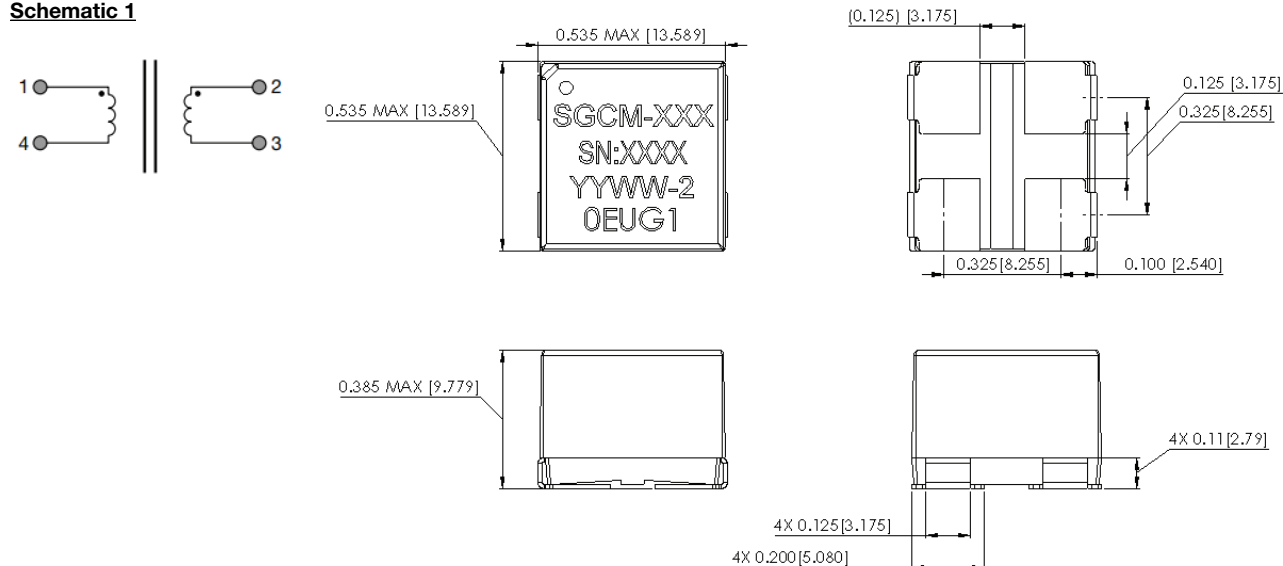
## STANDARD ELECTRICAL SPECIFICATIONS

PART NUMBER	L <sub>0</sub> INDUCTANCE PER WINDING ± 40 % AT 100 kHz, 0.10 V, 0 A (μH)	COMMON MODE IMPEDANCE, AT 10 MHz, TYP. (Ω)	DC RESISTANCE MAX. PER WINDING (Ω)	HEAT RATING CURRENT DC TYP. (A) <sup>(1)</sup>	PEAK IMPEDANCE FREQUENCY (Hz)	LEAKAGE MAX. (μH)
SGCM05339T321_	320	540	0.0029	14.43	31.74	0.35
SGCM05339T581_	580	930	0.0049	10.69	19.87	0.45
SGCM05339T901_	900	1440	0.0077	8.71	14.06	0.65
SGCM05339T132_	1295	2080	0.0118	7.14	10.78	0.95
SGCM05339T182_	1765	2960	0.0172	5.89	8.82	1.35
SGCM05339T232_	2305	3310	0.0197	5.53	6.76	1.75
SGCM05339T292_	2915	3740	0.0278	4.71	5.93	2.75
SGCM05339T362_	3600	4000	0.0309	4.20	5.02	3.25
SGCM05339T442_	4355	4040	0.0430	3.86	4.14	4.00
SGCM05339T522_	5185	3950	0.0589	3.32	3.73	4.25
SGCM05339T612_	6085	3980	0.0638	3.19	3.49	4.50
SGCM05339T712_	7055	3920	0.0873	2.73	2.89	5.00
SGCM05339T812_	8100	3880	0.0935	2.63	2.72	5.50
SGCM05339T922_	9215	3820	0.1240	2.02	2.25	6.50
SGCM05339T103_	10405	3600	0.1318	2.02	2.06	7.75

### Notes

- All test data is referenced to 25 °C ambient
  - The part temperature (ambient + temp. rise) should not exceed 130 °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
  - Specify desired screening code in " " placeholder at end of part number: P = production screened, L = low earth orbit (LEO) screened, B = MIL-STD-981 class B screened, S = MIL-STD-981 class S screened
- <sup>(1)</sup> DC current (A) through the windings in series that will cause an approximate ΔT of 30 °C

**DIMENSIONS** in inches [millimeters]

**Schematic 1**

**DESCRIPTION**

SGCM05539 MODEL	T = TAPE PACKAGE CODE	320 $\mu$ H INDUCTANCE VALUE	S <sup>(1)</sup> SCREENING CODE
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**Note**
<sup>(1)</sup> Reference "Screening Breakdown" table

**GLOBAL PART NUMBER**

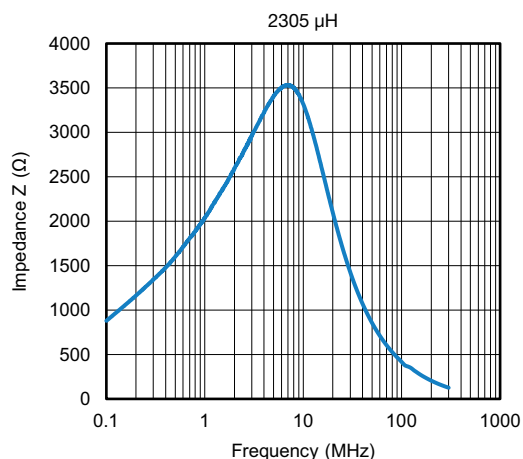
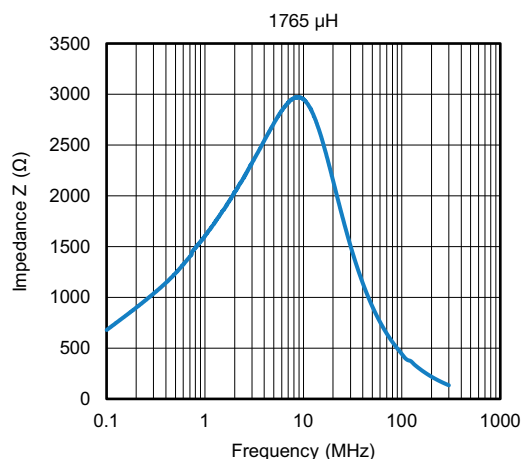
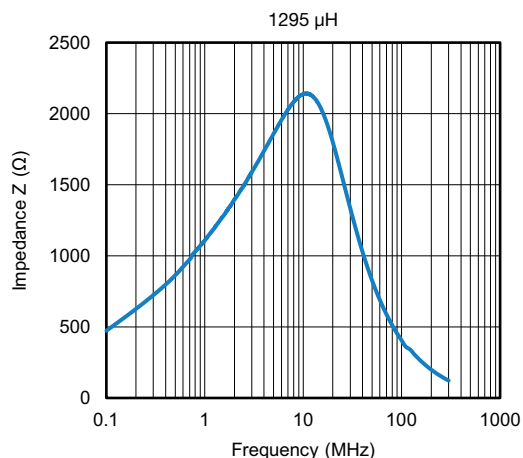
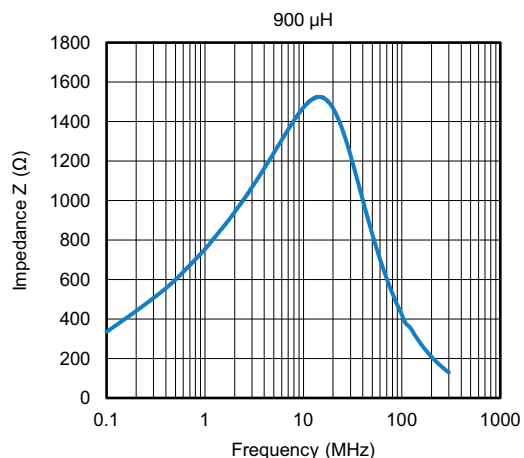
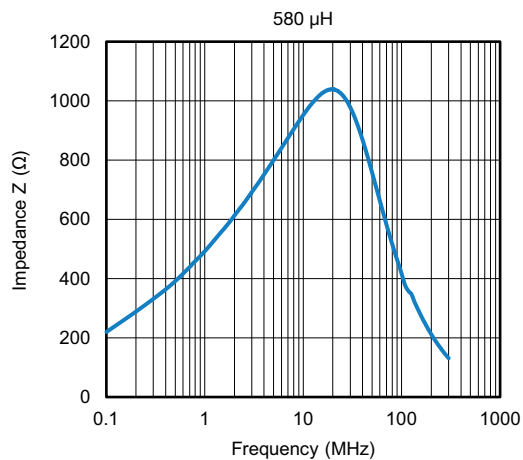
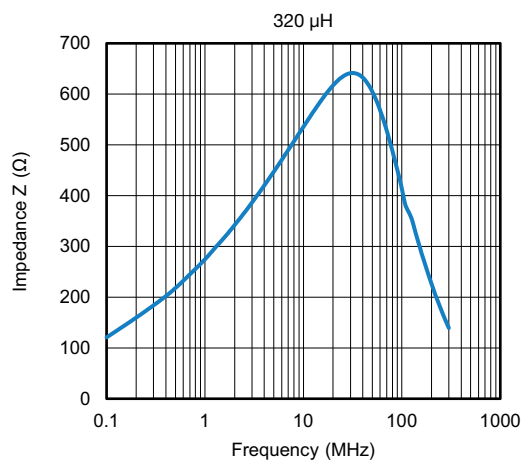
<b>S</b>	<b>G</b>	<b>C</b>	<b>M</b>	<b>0</b>	<b>5</b>	<b>3</b>	<b>3</b>	<b>9</b>	<b>T</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>S</b>
PRODUCT FAMILY				SIZE					PACKAGE CODE	IMPEDANCE VALUE			SCREENING
										321 = 320 $\mu$ H			



SCREENING BREAKDOWN						
	P = PRODUCTION N SCREENED	L = LOW EARTH ORBIT (LEO) SCREENED	E3 = EEE-INST-00 2 LEVEL 3 SCREENED	E2 = EEE-INST-00 2 LEVEL 2 SCREENED	B = MIL-STD-981 TABLE VI CLASS B SCREENED	S = MIL-STD-981 TABLE VI AND XII CLASS S SCREENED
<b>PRODUCTION SCREENING (sample size = 100 %)</b>						
Electrical characteristics (continuity, inductance (LS), turns ratio (TR), phase, leakage inductance, DWV, insulation resistance, DCR)	?	?	?	?	?	?
Mechanical inspection	?	?	?	?	?	?
Visual inspection	?	?	?	?	?	?
<b>QUALITY CONFORMANCE SCREENING (group A) (sample size = 100 %)</b>						
5 cycle thermal shock (-55 °C to +155 °C)	n/a	n/a	?	n/a		
10 cycle thermal shock (-55 °C to +155 °C)	n/a	?	n/a	?	n/a	n/a
96 hour burn-in at 155 °C (unpowered)	n/a	?	n/a	?	?	?
25 cycle thermal shock (-55 °C to +155 °C)	n/a	n/a	n/a	n/a	?	?
Dielectric withstanding voltage (DWV)	n/a	?	?	?	?	?
Dielectric withstanding voltage (DWV) at Altitude	n/a	n/a	?	?	n/a	n/a
Insulation resistance (IR)	n/a	?	?	?	?	?
Electrical characteristics (continuity, LS, TR, phase, leakage inductance, DCR)	n/a	?	?	?	?	?
Radiographic inspection	n/a	n/a	n/a	n/a	n/a	?
Mechanical inspection (sampled per table V; MIL-STD-981)	n/a	?	n/a	n/a	?	?
Visual inspection (100 %)	n/a	?	?	?	?	?
<b>QUALIFICATION INSPECTION (group B) (lot sampling)</b>						
MIL-STD-981 table XII	n/a	n/a	n/a	n/a	n/a	?
EEE-INST-002 Table 3	n/a	n/a	n/a	Optional	n/a	n/a

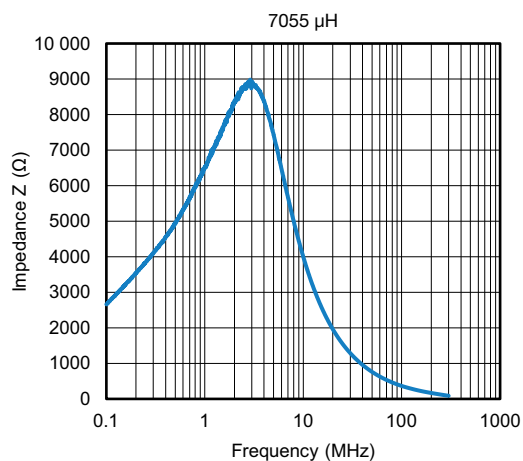
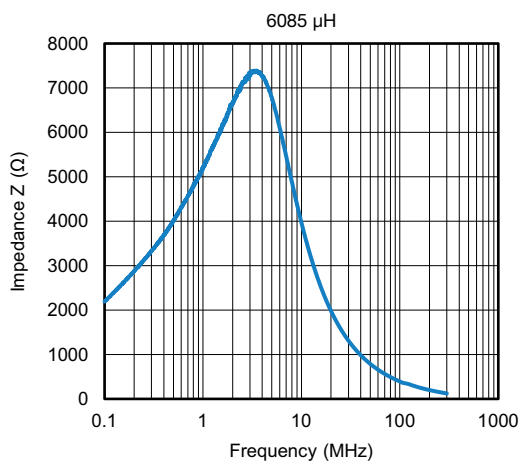
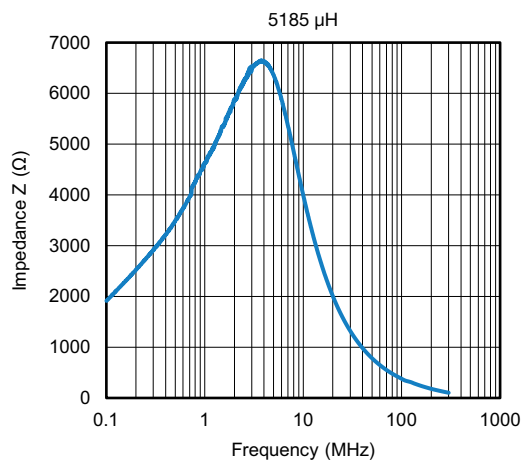
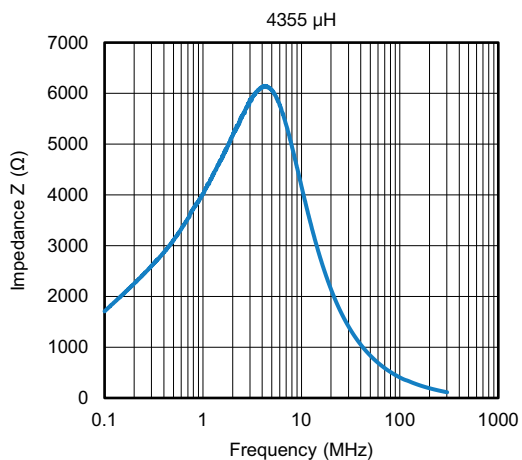
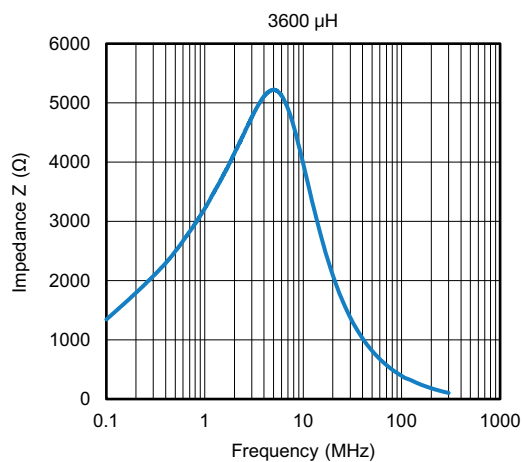
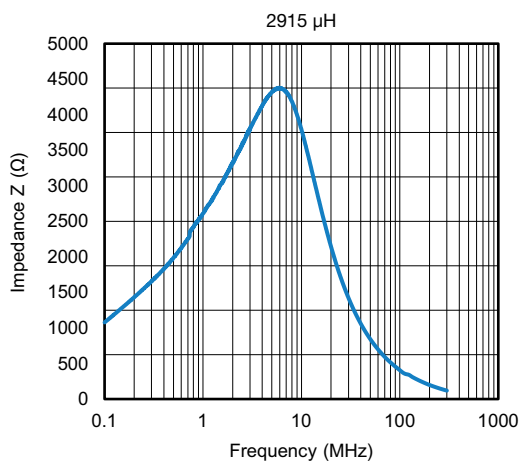
**PERFORMANCE GRAPHS: IMPEDANCE VS. FREQUENCY CHARACTERISTICS**

(common mode and differential mode)



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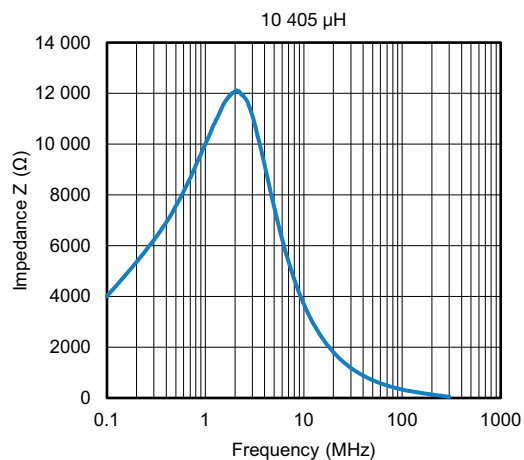
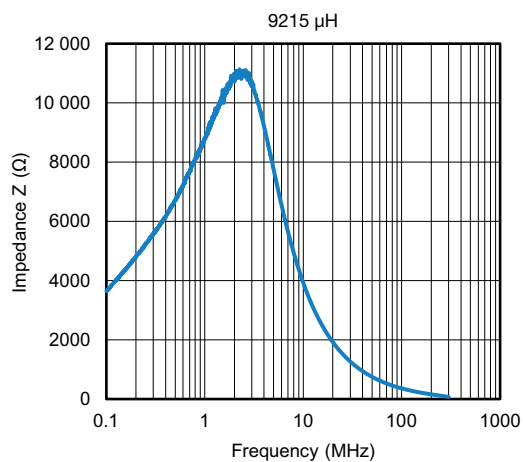
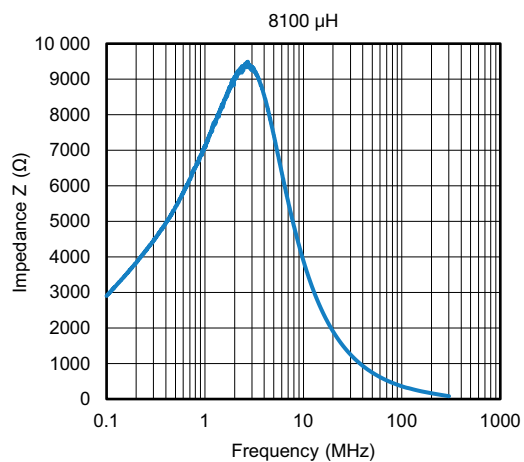
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# PERFORMANCE GRAPHS: IMPEDANCE VS. FREQUENCY CHARACTERISTICS

(common mode and differential mode)





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