Space Grade Planar Transformers With Multiple Output Secondaries for 150 W / 100 V Forward Converters

LINKS TO ADDITIONAL RESOURCES

Product Page

APPLICATIONS

- High reliability Space Grade switch mode power supplies
- 100 V primary input voltage forward converters
- Active clamp or dual switch forward converters up to 150 W

FEATURES

- Input voltage range: 78.4 V to 112.5 V
- Multiple secondaries can power up to three 5 V channels or two 12 V or 28 V channels
- Higher power density levels versus traditional planar designs
- Over-molded windings for environmental protection in ruggedized applications
- MIL-PRF-27 grade 5, product level T, temperature class S
- MIL-STD-981 family 03 power transformer, class S compliant (1)(2)
- ASTM-E595 outgassing compliant (3)
- Tin-lead (Sn63Pb37) coated terminations (does not contain tin composition percentages greater than 97 %)
- Customization available (e.g., pinouts, temperature class, screening, etc.)
- SGTPL design; PATENT(S): www.vishay.com/patents

Notes

(1) Screening codes S and B only

(2) 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. MIL-STD-981 5.5.10 and 5.5.11: parts soldered and inspected to J-STD-001S (space addendum)

c. Corona discharge is not applicable

(3) Applies to all external materials

ABSOLUTE MAXIMUM RATINGS			
PARAMETER	**CONDITIONS**	**LIMITS**	**UNITS**
Dielectric withstand voltage (DWV) (1)	Primary to secondary, windings to core	1250	V_{DC}
	Primary to primary, secondary to secondary	500	V_{DC}
Insulation resistance (2)	Windings to windings and core, 10 GΩ min.	500	V_{DC}
Power		150	W
Operating temperature	Continuous	-55 to +130	°C
Storage temperature	Continuous	-65 to +155	°C
Frequency		100 to 500	kHz
Mass	SGTPL2516	40	g
	SGTPL2511	28	g

Notes

(1) Test conditions adjusted per MIL-STD-981 and MIL-PRF-27 4.7.9.1 during group A and B testing; tested at equivalent DC test voltage

(2) Test conditions adjusted per MIL-STD-981 and MIL-PRF-27 4.7.11 during group A and B testing

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STANDARD ELECTRICAL SPECIFICATIONS (part number specific)

PART NUMBER (1)	PRIMARY INPUT VOLTAGE (V)	SECONDARY OUTPUT VOLTAGE (V)	TURNS RATIO (PRI : SEC) (2)	OPTIMIZED OPERATING FREQ (kHZ)	PRIMARY INDUCTANCE (µH) (3)		LEAKAGE INDUCTANCE MAX. (µH) (3)	DCR MAX. (mΩ)						OUTPUT POWER (TYP.) (W) (4)(5)
					MIN.	MAX.		PRIMARY 1	PRIMARY 2	PRIMARY 3	SECONDARY 1	SECONDARY 2	SECONDARY 3	
SGTPL2516T010028_	78.4 to 112.5	28	1.125 : 1	200	340	600	0.200	18	n/a	n/a	18	n/a	n/a	150
SGTPL2516T010012_	78.4 to 112.5	12	2.250 : 1	200	340	600	0.300	20	n/a	n/a	12	12	n/a	150
SGTPL2516T010005_	78.4 to 112.5	5	5.000 : 1	200	400	745	0.550	25	n/a	n/a	7	7	7	150
SGTPL2511T010028_	78.4 to 112.5	28	1.125: 1	200	380	705	0.400	30	n/a	n/a	25	n/a	n/a	100
SGTPL2511T010012_	78.4 to 112.5	12	2.250 : 1	200	380	705	0.400	35	n/a	n/a	18	18	n/a	100
SGTPL2511T010005_	78.4 to 112.5	5	5.000 : 1	200	427	793	0.550	40	n/a	n/a	10	10	n/a	100

Notes

- All test data is referenced to 25 °C ambient unless otherwise specified

(1) See below sections for screening code options

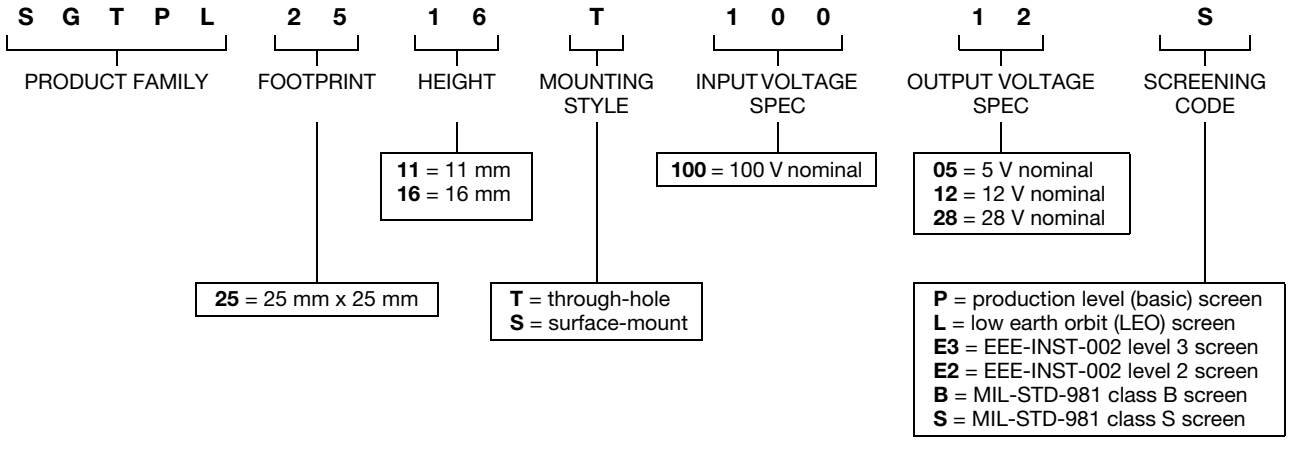
(2) Turns ratio test condition: ± 3 %, 1 V_{RMS}, 100 kHz

(3) Inductance test condition: 100 mV_{RMS}, 200 kHz

(4) Typical power ratings for a 25 °C temperature rise

(5) Derate maximum output power linearly from +105 °C to +130 °C

GLOBAL PART NUMBER



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SCREENING BREAKDOWN						
	P = PRODUCTION SCREENED	L = LOW EARTH ORBIT (LEO) SCREENED	E3 = EEE-INST-002 LEVEL 3 SCREENED	E2 = EEE-INST-002 LEVEL 2 SCREENED	B = MIL-STD-981 TABLE VI CLASS B SCREENED	S = MIL-STD-981 TABLE VI AND XII CLASS S SCREENED
PRODUCTION SCREENING (sample size = 100 %)						
Electrical characteristics (continuity, inductance (L_S), turns ratio (TR), phase, leakage inductance, DWV, insulation resistance, DCR)	✓	✓	✓	✓	✓	✓
Mechanical inspection	✓	✓	✓	✓	✓	✓
Visual inspection	✓	✓	✓	✓	✓	✓
QUALITY CONFORMANCE SCREENING (group A) (sample size = 100 %)						
5 cycle thermal shock (-55 °C to +130 °C)	n/a	n/a	✓	n/a	n/a	n/a
10 cycle thermal shock (-55 °C to +130 °C)	n/a	✓	n/a	✓	n/a	n/a
96 hour burn-in at 130 °C (unpowered)	n/a	✓	n/a	n/a	n/a	n/a
25 cycle thermal shock (-55 °C to +130 °C)	n/a	n/a	n/a	n/a	✓	✓
96 hour burn-in at 130 °C (powered) (130 °C = ambient temperature + temperature rise)	n/a	n/a	n/a	✓	✓	✓
Induced voltage	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, L_S, 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	✓	✓	✓	✓	✓
QUALIFICATION INSPECTION (group B) (lot sampling)						
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

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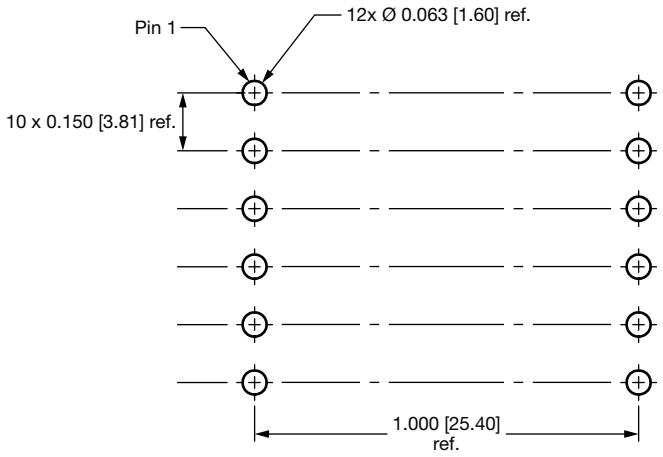
TYPICAL BOARD PIN LAYOUT



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DIMENSIONS in inches [millimeters]

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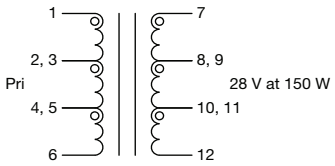

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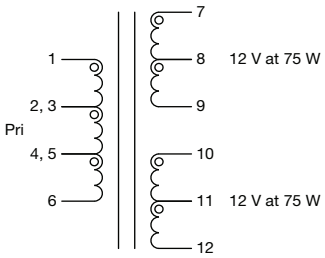

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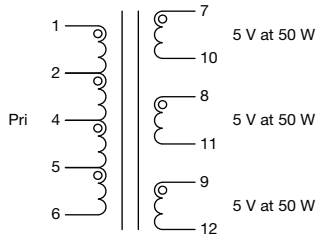

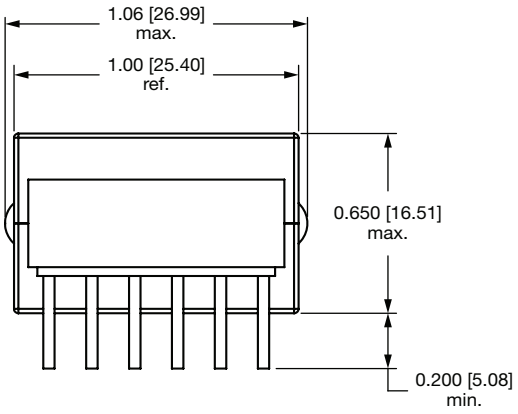

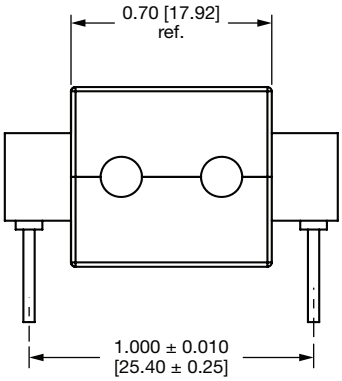

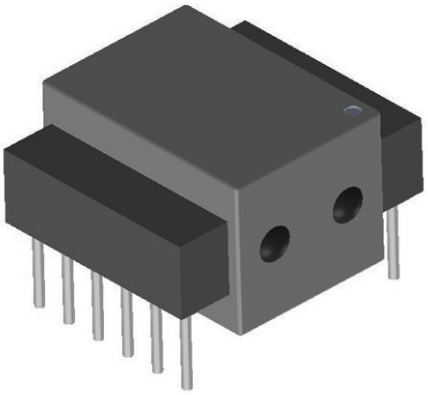

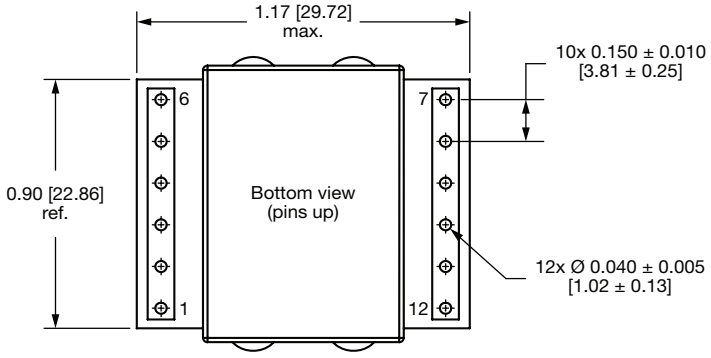

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DIMENSIONS in inches [millimeters]

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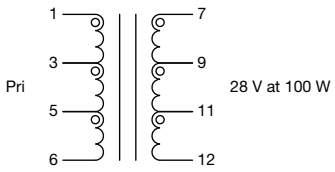

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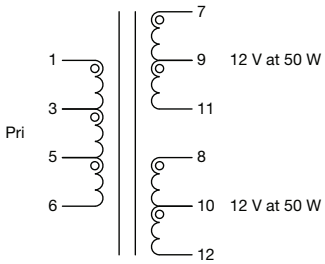

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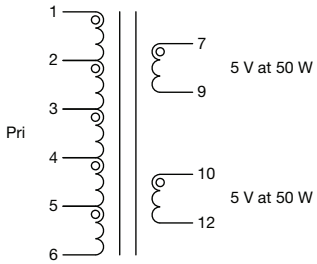

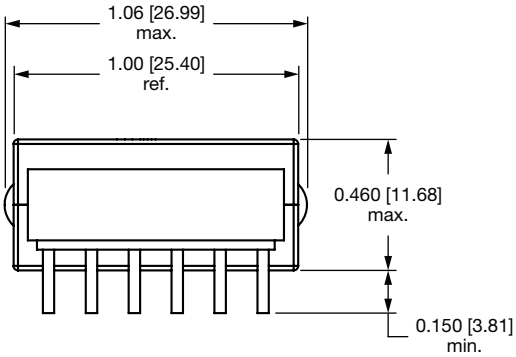

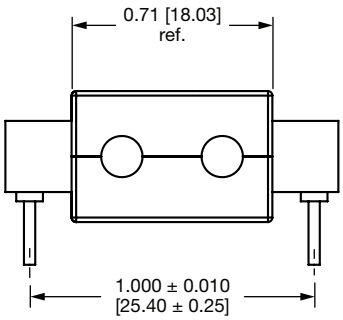

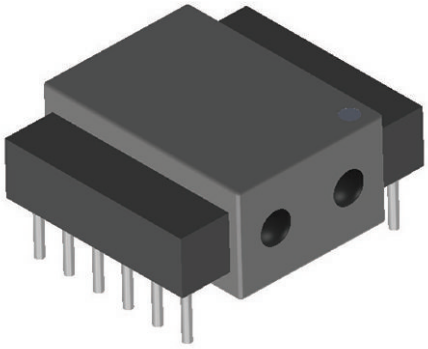

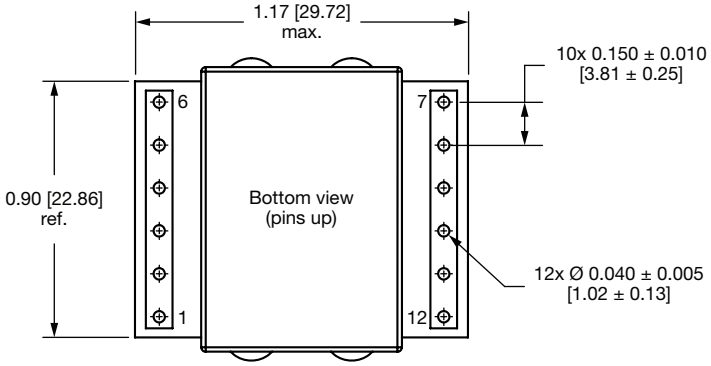

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