

Space Grade Planar Transformers With Multiple Output Secondaries for 150 W / 28 V Input Forward Converters



LINKS TO ADDITIONAL RESOURCES


[Product Page](#)

APPLICATIONS

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

FEATURES

- Input voltage range: 18 V to 36 V
- Multiple secondaries can power up to two 12 V channels or up to four 5 V channels with center tap
- Higher power density levels versus traditional planar designs
- Optimized for 150 W forward converter topologies using 28 V input and 200 kHz operation
- 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):
- MIL-STD-981 figures 3b, c, and d do not apply to this assembly's build construction
 - MIL-STD-981 5.5.10 & 5.5.11: parts soldered and inspected to J-STD-001S (space addendum)
 - 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

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



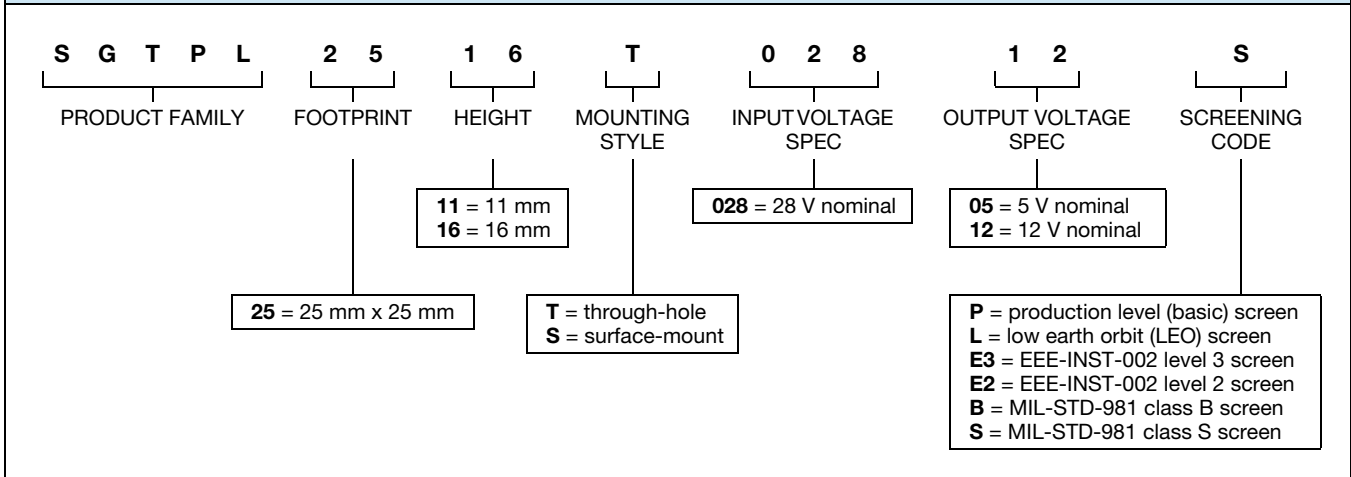
STANDARD ELECTRICAL SPECIFICATIONS (part number specific)

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
SGTPL2516T02812_	18 to 36	12	0.600 : 1	200	38	65	0.5	7	7	n/a	10	20	n/a	150
SGTPL2516T02805_	18 to 36	5	1.500 : 1	200	38	65	0.5	10	10	10	7	7	n/a	150
SGTPL2511T02812_	18 to 36	12	0.600 : 1	200	38	65	0.5	15	15	15	20	20	n/a	100
SGTPL2511T02805_	18 to 36	5	1.500 : 1	200	38	65	0.5	15	15	15	10	10	10	100

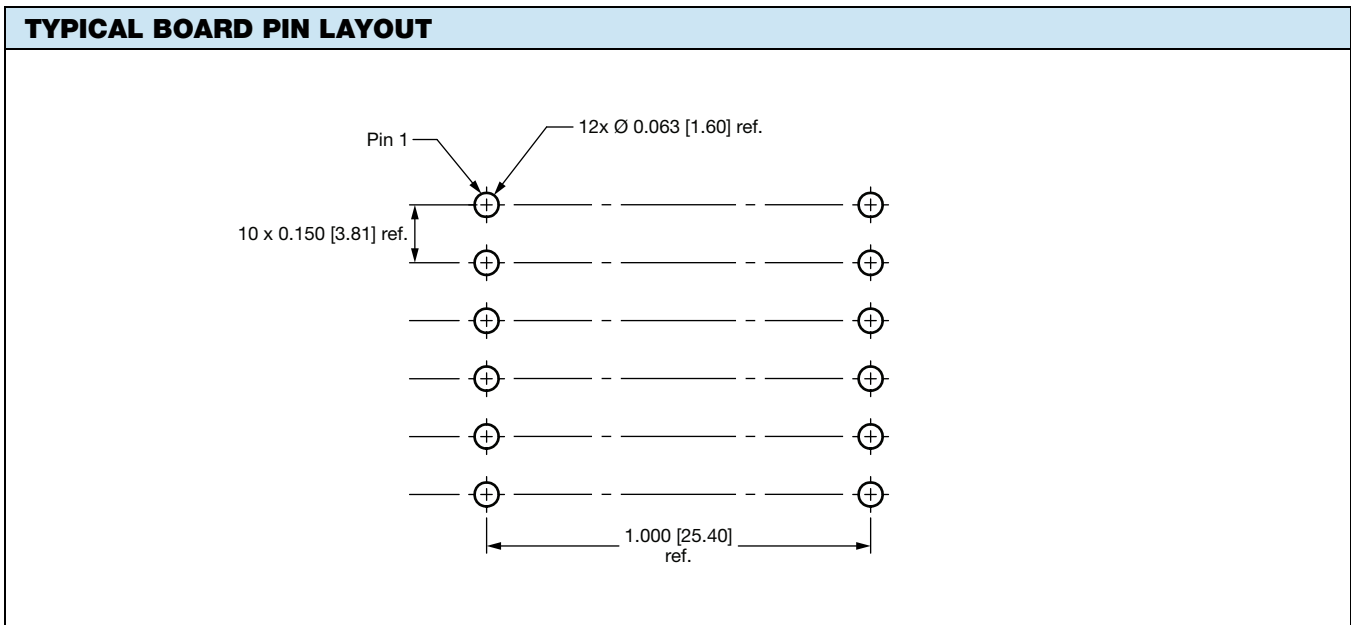
Notes

- 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

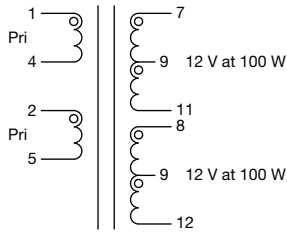


SCREENING BREAKDOWN TABLE				
	P = PRODUCTION SCREENED	L = LOW EARTH ORBIT (LEO) SCREENED	B = MIL-STD-981 TABLE VI CLASS B SCREENED	S = MIL-STD-981 TABLE VI AND XII CLASS S SCREENED
PRODUCTION SCREENING (sample size = 100 %)				
Electrical characteristics (continuity, inductance (L _S), turns ratio (TR), phase, leakage inductance, DWV, insulation resistance, DCR)	✓	✓	✓	✓
Mechanical inspection	✓	✓	✓	✓
Visual inspection	✓	✓	✓	✓
QUALITY CONFORMANCE SCREENING (group A) (sample size = 100 %)				
10 cycle thermal shock (-55 °C to +130 °C)	n/a	✓	n/a	n/a
96 h burn-in at 130 °C (unpowered)	n/a	✓	n/a	n/a
25 cycle thermal shock (-55 °C to +130 °C)	n/a	n/a	✓	✓
96 hour burn-in at 130 °C (powered) (130 °C = ambient temp. + temp. rise)	n/a	n/a	✓	✓
Induced voltage	n/a	n/a	✓	✓
Dielectric withstanding voltage (DWV)	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	✓
Mechanical inspection (sampled per table V; MIL-STD-981)	n/a	✓	✓	✓
Visual inspection (100 %)	n/a	✓	✓	✓
QUALIFICATION INSPECTION (group B) (sample size = 4 pieces)				
MIL-STD-981 table XII	n/a	n/a	n/a	✓

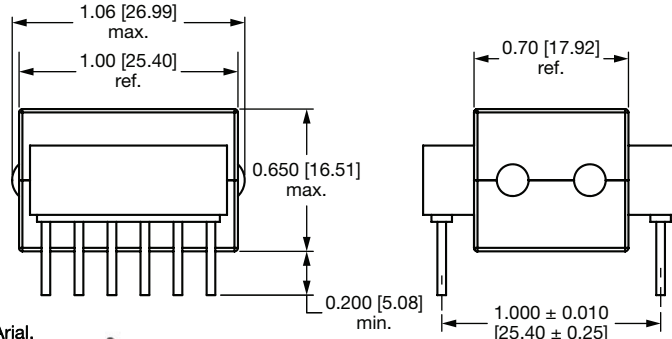


DIMENSIONS in inches [millimeters]

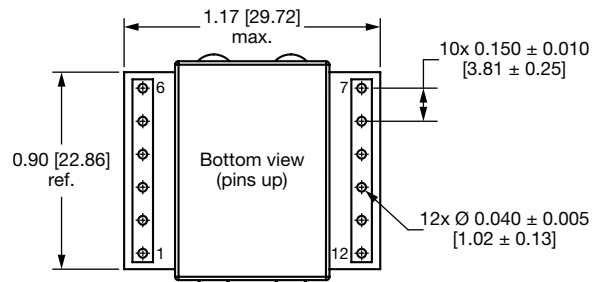
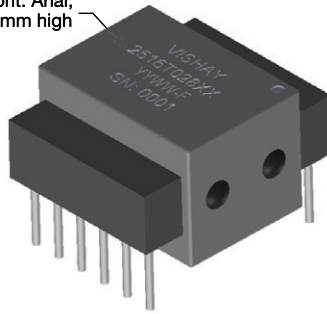
SGTPL2516T02812x



Primary pins 1, 2 and 4, 5 should be tied for proper operation

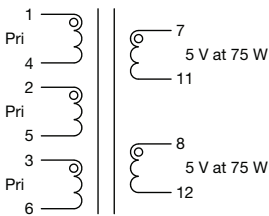


Font: Arial, 2 mm high



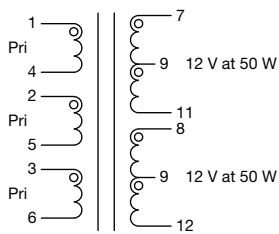
Maximum weight of 40 grams

SGTPL2516T02805x

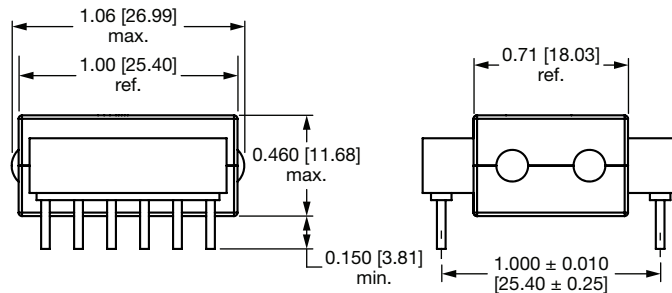


Primary pins 1, 2, 3 and 4, 5, 6 should be tied for proper operation

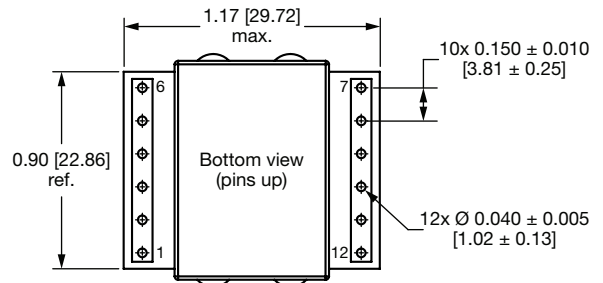
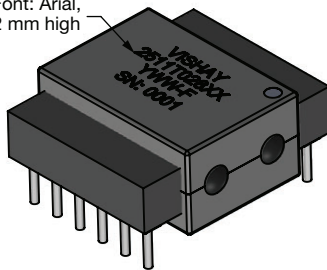
SGTPL2511T02812x



Primary pins 1, 2, 3 and 4, 5, 6 should be tied for proper operation

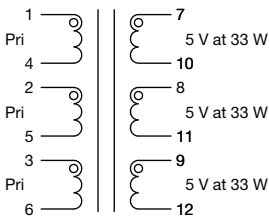


Font: Arial, 2 mm high



Maximum weight of 28 grams

SGTPL2511T02805x



Primary pins 1, 2, 3 and 4, 5, 6 should be tied for proper operation



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Vishay products are not designed for use in life-saving or life-sustaining applications or any application in which the failure of the Vishay product could result in personal injury or death unless specifically qualified in writing by Vishay. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.