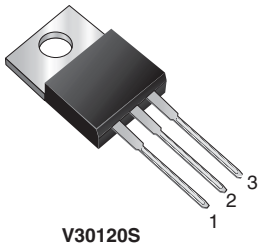
V30120S-E3, VF30120S-E3, VB30120S-E3, VI30120S-E3

High Voltage Trench MOS Barrier Schottky Rectifier

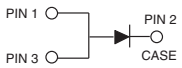
Ultra Low V_F = 0.43 V at I_F = 5 A

TMBS®

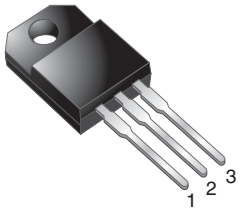
TO-220AB



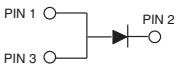
V30120S



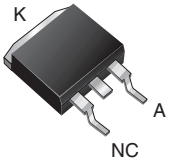
ITO-220AB



VF30120S

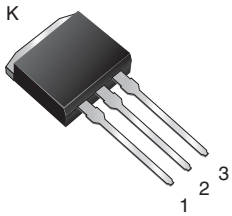


TO-263AB

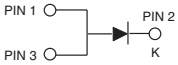


VB30120S

TO-262AA



VI30120S



FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder bath temperature 275 °C maximum, 10 s, per JESD 22-B106 (for TO-220AB, ITO-220AB, and TO-262AA package)
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency converters, switching power supplies, freewheeling diodes, OR-ing diode, DC/DC converters and reverse battery protection.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB and TO-262AA

Molding compound meets UL 94 V-0 flammability rating Base P/N-E3 - RoHS-compliant, commercial grade

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	30 A
V_{RRM}	120 V
I_{FSM}	300 A
V_F at I_F = 30 A	0.74 V
T_J max.	150 °C
Package	TO-220AB, ITO-220AB, TO-263AB, TO-262AA
Diode variation	Single die

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	V30120S	VF30120S	VB30120S	VI30120S	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	120				V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$	30				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	300				A
Non-repetitive avalanche energy at T_J = 25 °C, L = 100 mH	E_{AS}	180				mJ
Peak repetitive reverse current at t_p = 2 µs, 1 kHz, T_J = 38 °C ± 2 °C	I_{RRM}	0.5				A
Voltage rate of change (rated V_R)	dV/dt	10 000				V/µs
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V_{AC}	1500				V
Operating junction and storage temperature range	T_J, T_{STG}	-40 to +150				°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage per diode (1)	I_F = 5 A	T_A = 25 °C	V_F	0.50	-	V
	I_F = 15 A			0.70	-	
	I_F = 30 A			0.99	1.10	
	I_F = 5 A	T_A = 125 °C		0.43	-	
	I_F = 15 A			0.60	-	
	I_F = 30 A			0.74	0.82	
Reverse current per diode (2)	V_R = 90 V	T_A = 25 °C	I_R	18	-	µA
		T_A = 125 °C		12	-	mA
	V_R = 120 V	T_A = 25 °C		-	500	µA
		T_A = 125 °C		22	35	mA

Notes

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**V30120S**	**VF30120S**	**VB30120S**	**VI30120S**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	1.6	4.0	1.6	1.6	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V30120S-E3/4W	1.88	4W	50/tube	Tube
ITO-220AB	VF30120S-E3/4W	1.75	4W	50/tube	Tube
TO-263AB	VB30120S-E3/4W	1.39	4W	50/tube	Tube
TO-263AB	VB30120S-E3/8W	1.39	8W	800/reel	Tape and reel
TO-262AA	VI30120S-E3/4W	1.46	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

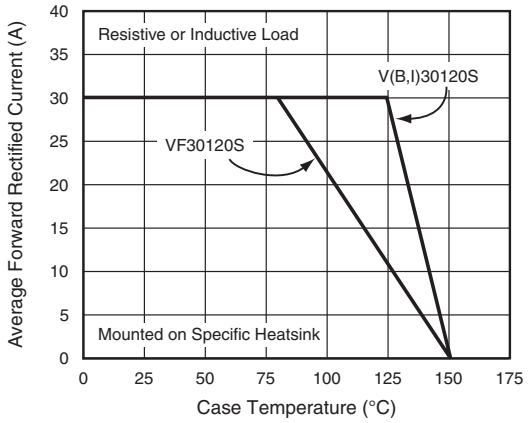


Fig. 1 - Forward Current Derating Curve

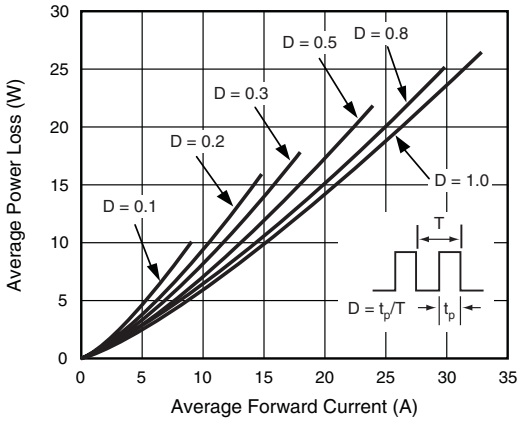


Fig. 2 - Forward Power Loss Characteristics Per Diode

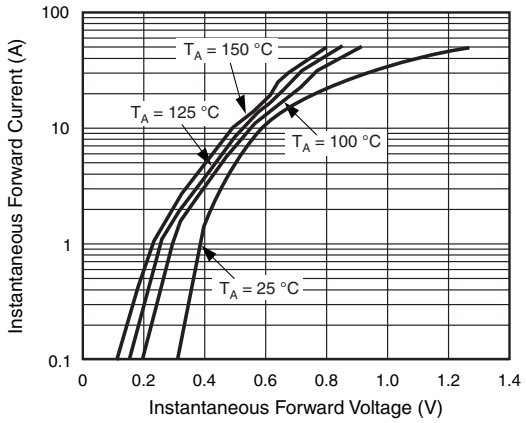


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

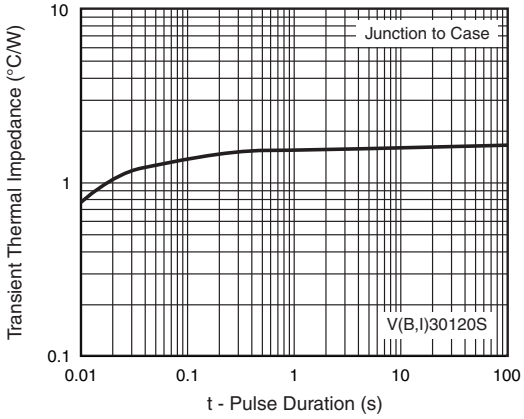


Fig. 6 - Typical Transient Thermal Impedance Per Diode

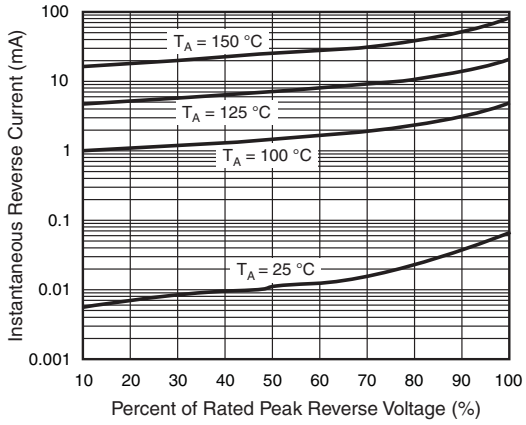


Fig. 4 - Typical Reverse Characteristics Per Diode

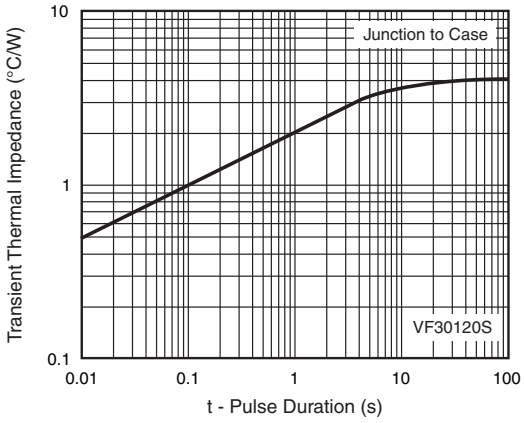


Fig. 7 - Typical Transient Thermal Impedance Per Diode

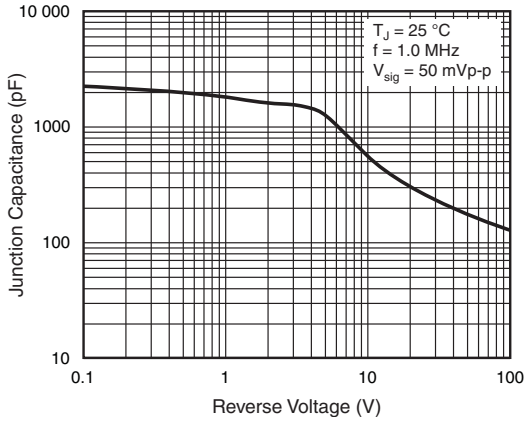
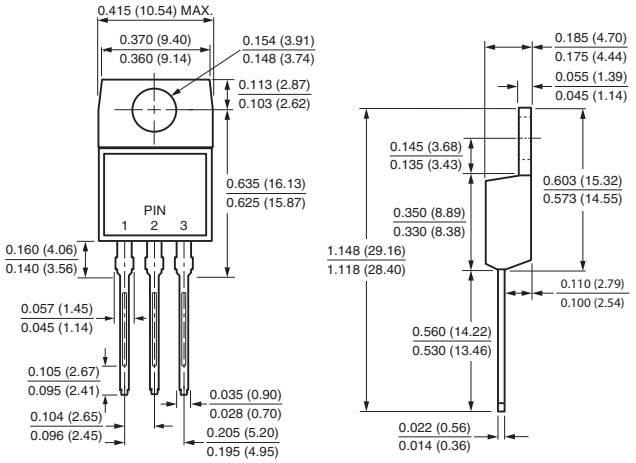


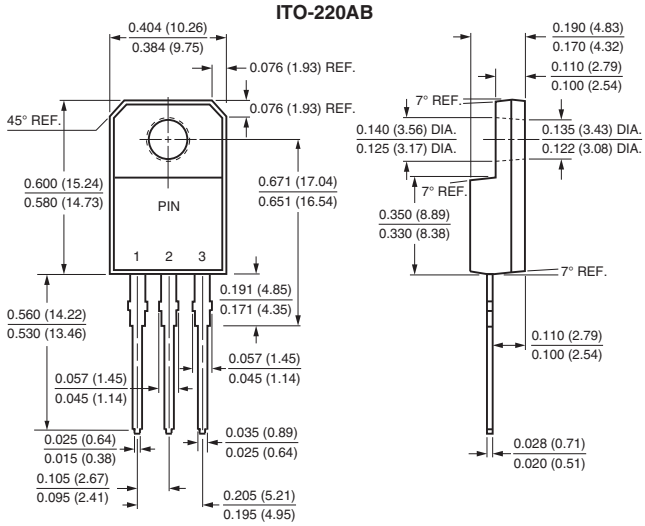
Fig. 5 - Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

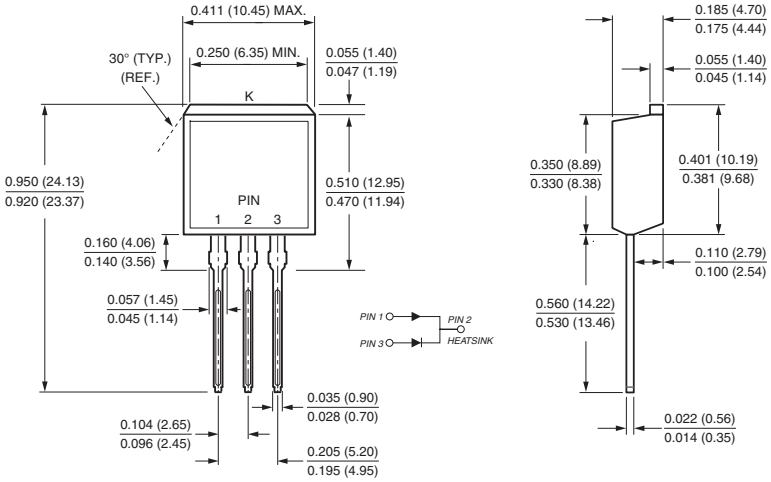
TO-220AB



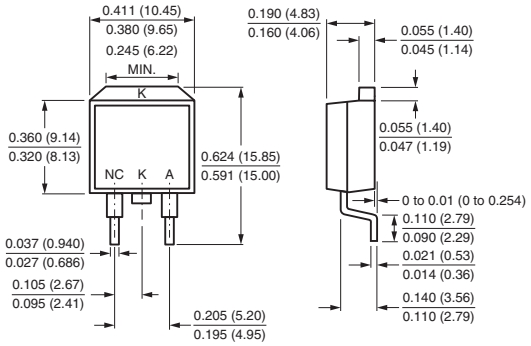
ITO-220AB



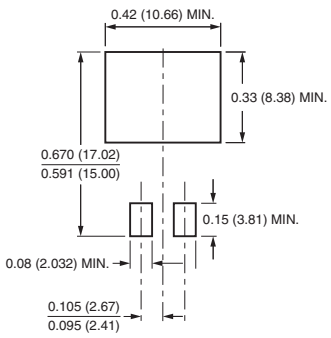
TO-262AA



TO-263AB



Mounting Pad Layout



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