V30120S, VF30120S, VB30120S & VI30120S

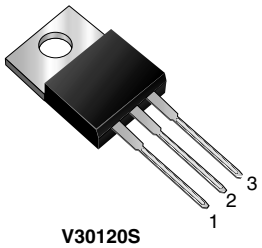
Vishay General Semiconductor

High-Voltage Trench MOS Barrier Schottky Rectifier

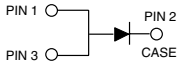
Ultra Low V_F = 0.43 V at I_F = 5 A

TMBS®

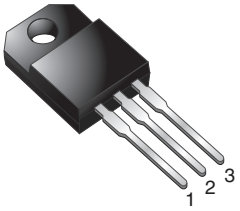
TO-220AB



V30120S



ITO-220AB



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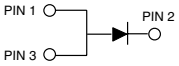
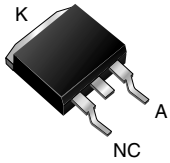


TO-263AB



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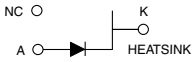
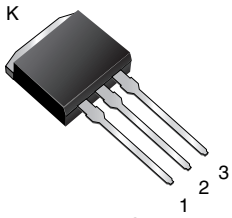
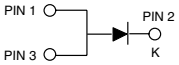


TO-262AA



VI30120S



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

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)
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency converters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-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

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

V30120S, VF30120S, VB30120S & VI30120S

Vishay General Semiconductor

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Breakdown voltage	I_R = 1.0 mA	T_A = 25 °C	V_{BR}	120 (minimum)	-	V
Instantaneous forward voltage (1)	I_F = 5 A I_F = 15 A I_F = 30 A	T_A = 25 °C	V_F	0.50 0.70 0.99	- - 1.10	V
	I_F = 5 A I_F = 15 A I_F = 30 A	T_A = 125 °C		0.43 0.60 0.74	- - 0.82	
Reverse current (2)	V_R = 90 V	T_A = 25 °C T_A = 125 °C	I_R	18 12	- -	µA mA
	V_R = 120 V	T_A = 25 °C T_A = 125 °C		- 22	500 35	µA 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	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	1.76	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)

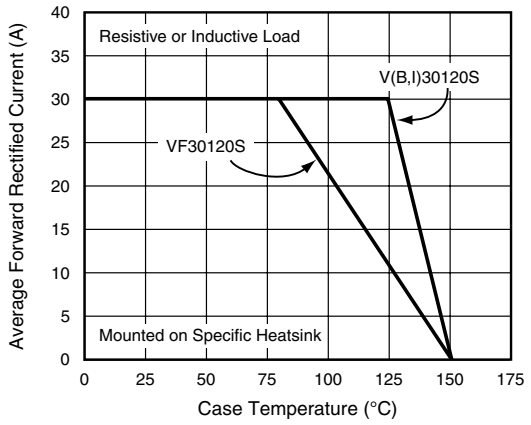


Figure 1. Forward Current Derating Curve

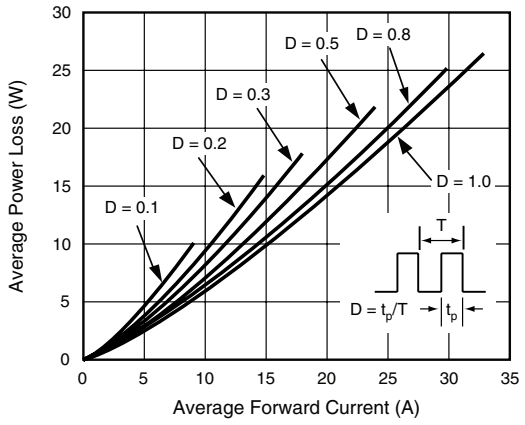


Figure 2. Forward Power Loss Characteristics Per Diode

For technical questions within your region, please contact one of the following:
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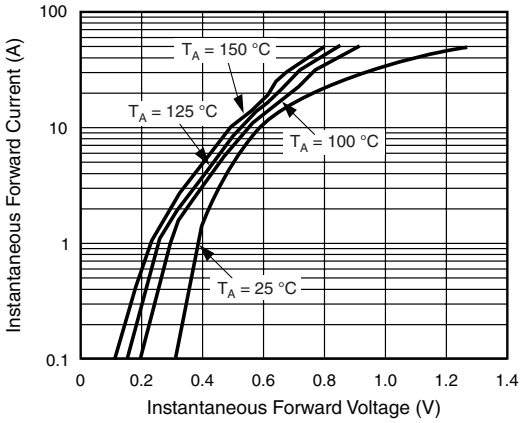


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

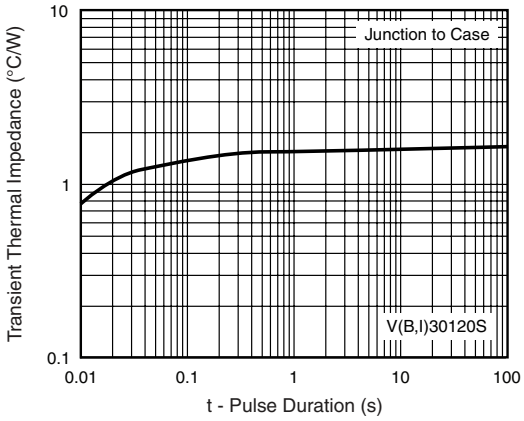


Figure 6. Typical Transient Thermal Impedance Per Diode

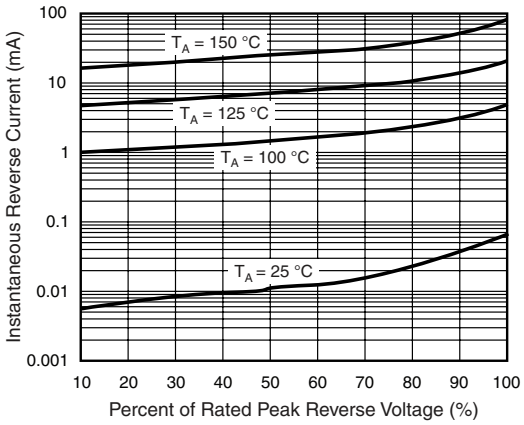


Figure 4. Typical Reverse Characteristics Per Diode

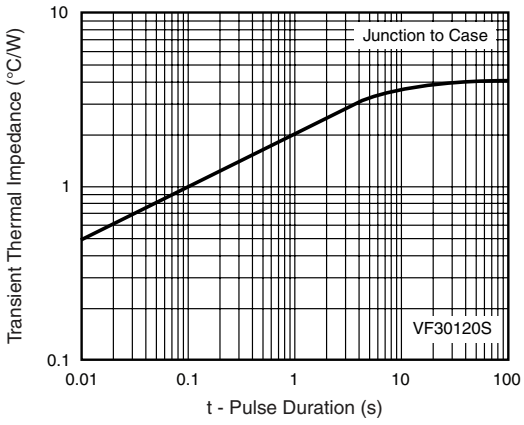


Figure 7. Typical Transient Thermal Impedance Per Diode

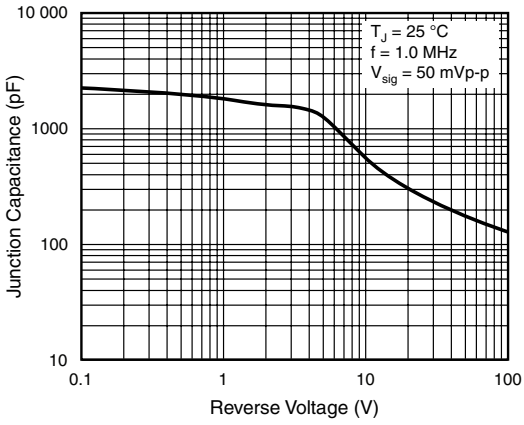
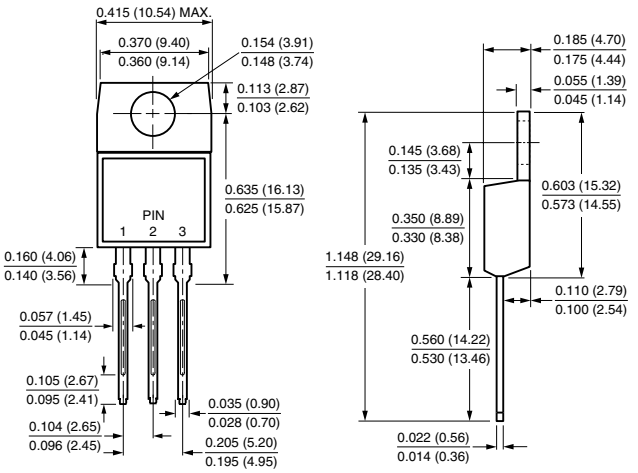


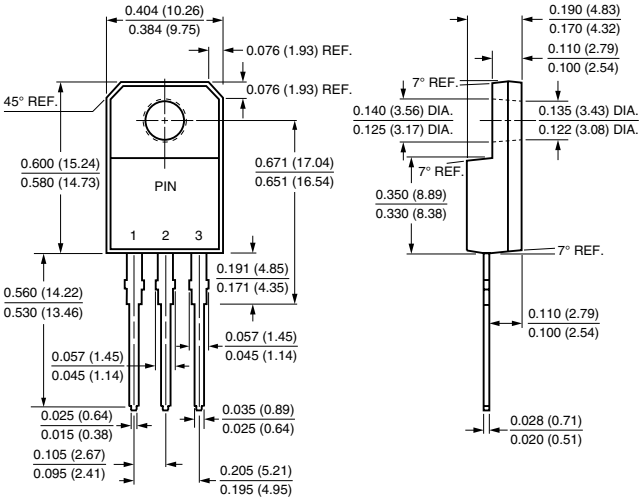
Figure 5. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AB



ITO-220AB



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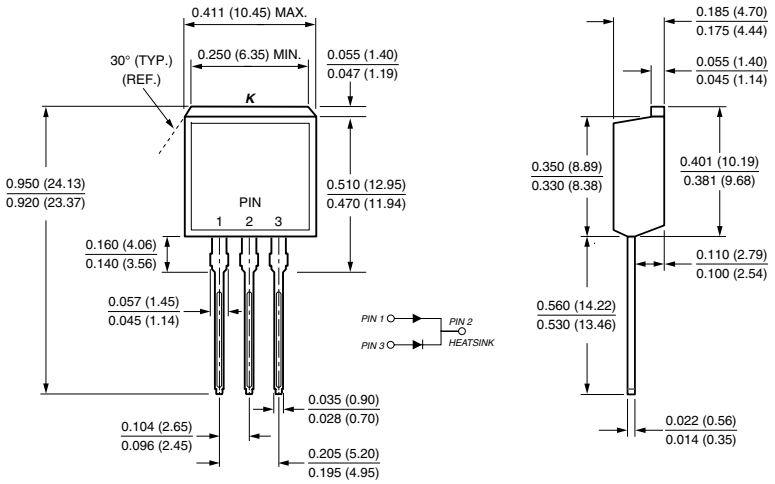
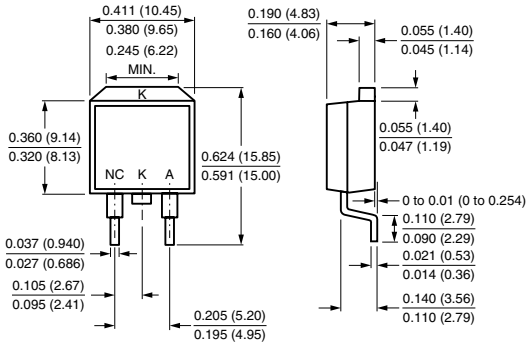
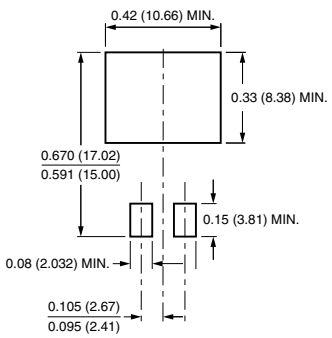


TO-263AB



Mounting Pad Layout



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