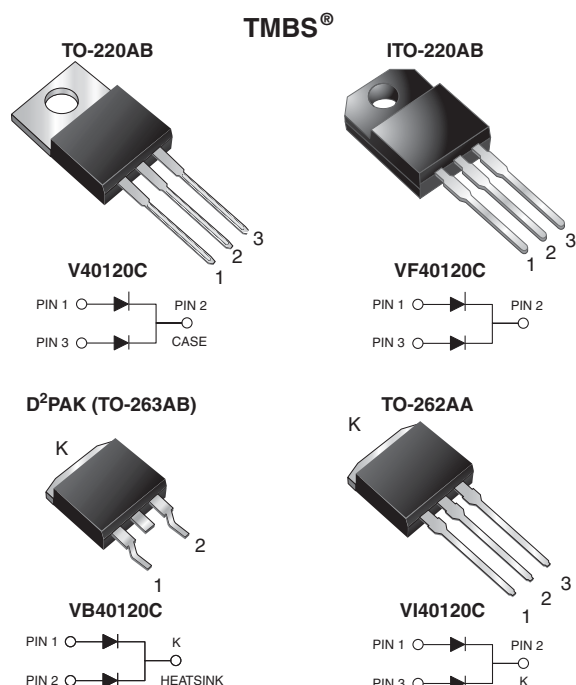




Dual High Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low $V_F = 0.43\text{ V}$ at $I_F = 5\text{ A}$ 

DESIGN SUPPORT TOOLS



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PRIMARY CHARACTERISTICS

$I_{F(AV)}$	2 x 20 A
V_{RRM}	120 V
I_{FSM}	250 A
V_F at $I_F = 20\text{ A}$	0.63 V
T_J max.	150 °C
Package	TO-220AB, ITO-220AB, D ² PAK (TO-263AB), TO-262AA
Circuit configuration	Common cathode

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, D²PAK (TO-263AB), and TO-262AA

Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS-compliant, commercial grade
Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

E3 and M3 suffix meet JESD 201 class 1A whisker test

Polarity: as marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS ($T_A = 25\text{ °C}$ unless otherwise noted)

PARAMETER	SYMBOL	V40120C	VF40120C	VB40120C	VI40120C	UNIT
Maximum repetitive peak reverse voltage	V _{RRM}	120				V
Maximum average forward rectified current (fig. 1) per device per diode	I _{F(AV)}	40				A
		20				
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I _{FSM}	250				A
Non-repetitive avalanche energy at T _J = 25 °C, L = 100 mH per diode	E _{AS}	180				mJ
Peak repetitive reverse current at t _p = 2 μs, 1 kHz, T _J = 38 °C ± 2 °C per diode	I _{RRM}	0.5				A
Voltage rate of change (rated V _R)	dV/dt	10 000				V/μs
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
Breakdown voltage	I _R = 1.0 mA	T _A = 25 °C	V _{BR}	120 (minimum)	-	V
Instantaneous forward voltage per diode	I _F = 5 A	T _A = 25 °C	V _F ⁽¹⁾	0.50	-	V
	I _F = 10 A			0.60	-	
	I _F = 20 A			0.78	0.88	
	I _F = 5 A	T _A = 125 °C		0.43	-	
	I _F = 10 A			0.53	-	
	I _F = 20 A			0.63	0.71	
Reverse current per diode	V _R = 90 V	T _A = 25 °C	I _R ⁽²⁾	19	-	μA
		T _A = 125 °C		10	-	mA
	V _R = 120 V	T _A = 25 °C		-	500	μA
		T _A = 125 °C		22	45	mA

Notes

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
 (2) Pulse test: Pulse width $\leq 40\text{ ms}$

THERMAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)						
PARAMETER	SYMBOL	V40120C	VF40120C	VB40120C	VI40120C	UNIT
Typical thermal resistance per diode	$R_{\theta JC}$	1.8	4.0	1.8	1.8	$^{\circ}\text{C/W}$

ORDERING INFORMATION (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-220AB	V40120C-E3/4W	1.88	4W	50/tube	Tube
ITO-220AB	VF40120C-E3/4W	1.76	4W	50/tube	Tube
TO-263AB	VB40120C-E3/4W	1.39	4W	50/tube	Tube
TO-263AB	VB40120C-E3/8W	1.39	8W	800/reel	Tape and reel
TO-262AA	VI40120C-E3/4W	1.46	4W	50/tube	Tube
TO-220AB	V40120C-M3/4W	1.88	4W	50/tube	Tube
ITO-220AB	VF40120C-M3/4W	1.76	4W	50/tube	Tube
TO-263AB	VB40120C-M3/4W	1.39	4W	50/tube	Tube
TO-263AB	VB40120C-M3/8W	1.39	8W	800/reel	Tape and reel
TO-262AA	VI40120C-M3/4W	1.46	4W	50/tube	Tube



RATINGS AND CHARACTERISTICS CURVES ($T_A = 25^\circ\text{C}$ unless otherwise noted)

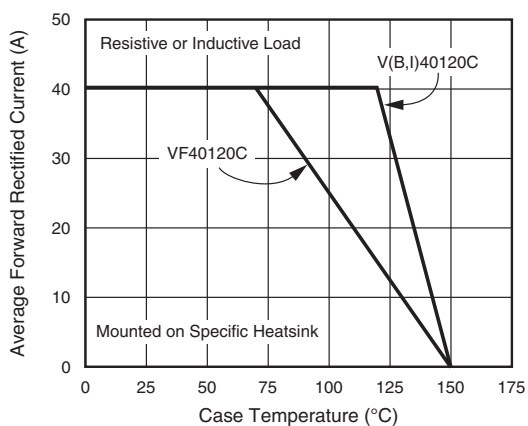


Fig. 1 - Maximum Forward Current Derating Curve

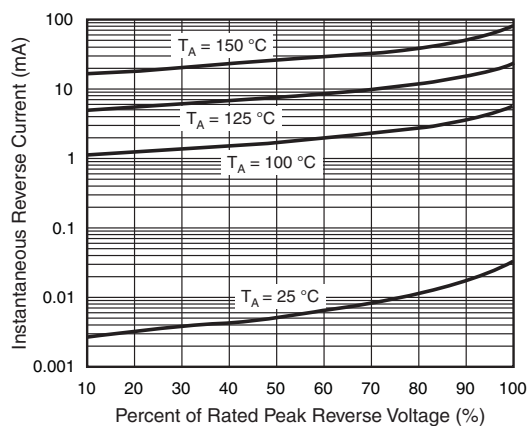


Fig. 4 - Typical Reverse Characteristics Per Diode

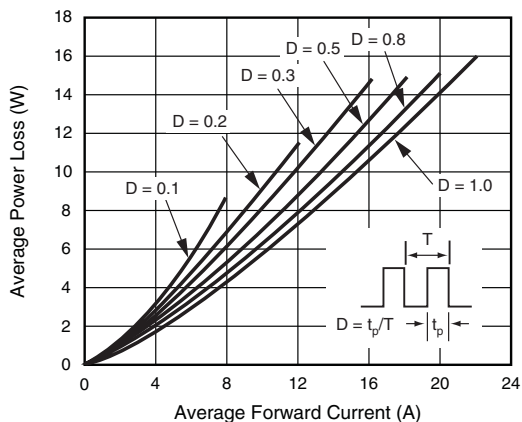


Fig. 2 - Forward Power Loss Characteristics Per Diode

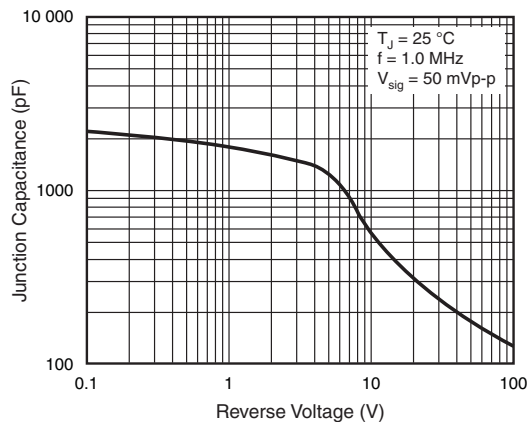


Fig. 5 - Typical Junction Capacitance Per Diode

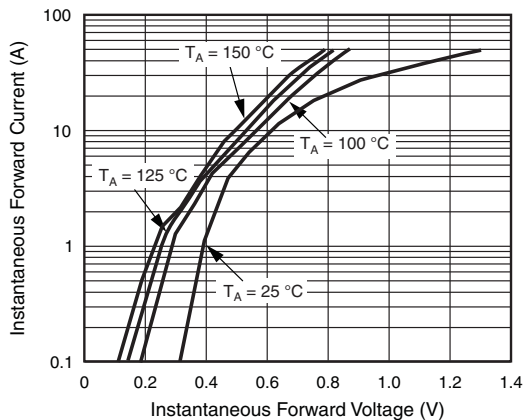


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

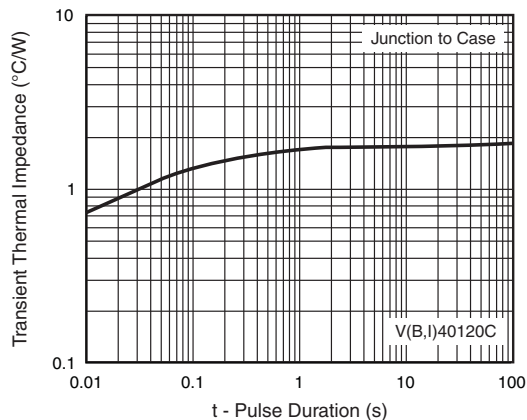


Fig. 6 - Typical Transient Thermal Impedance Per Diode

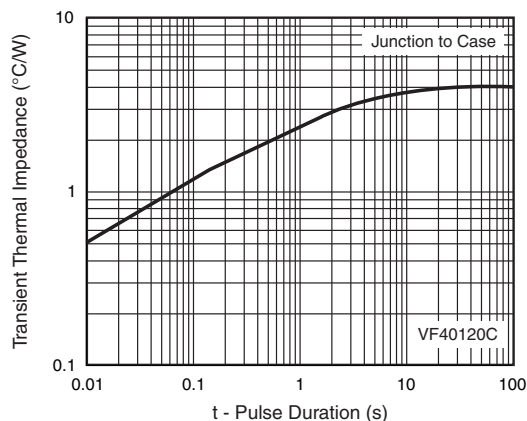
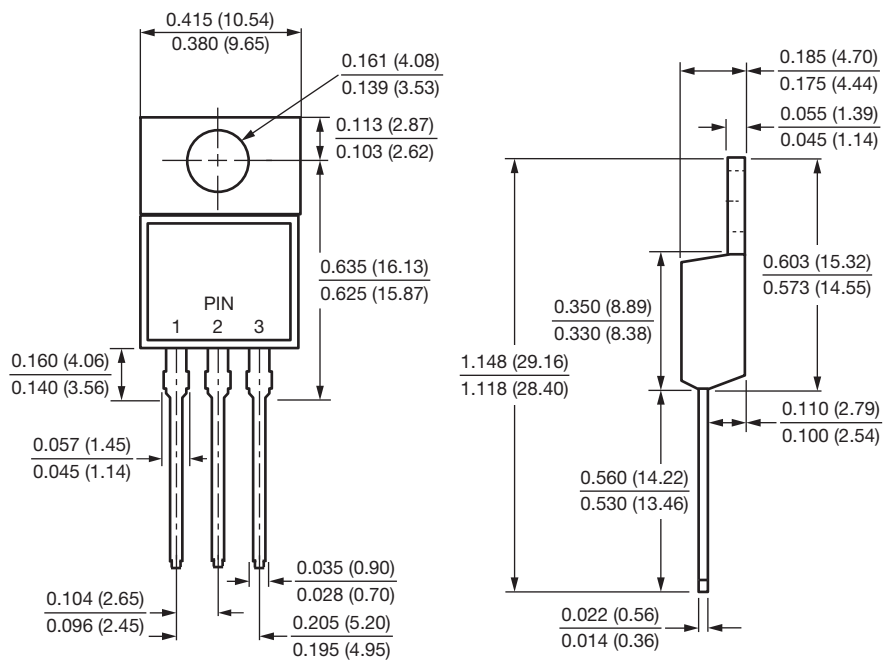
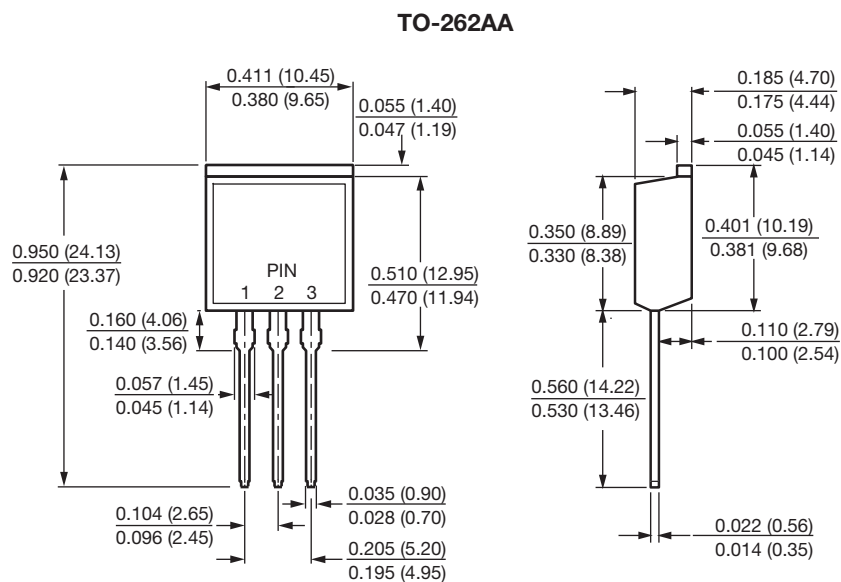
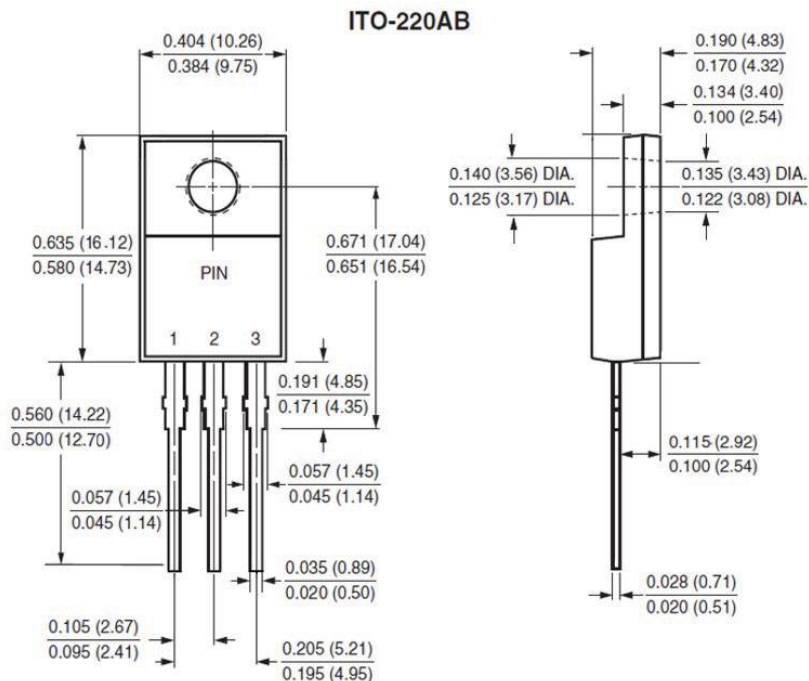


Fig. 7 - Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

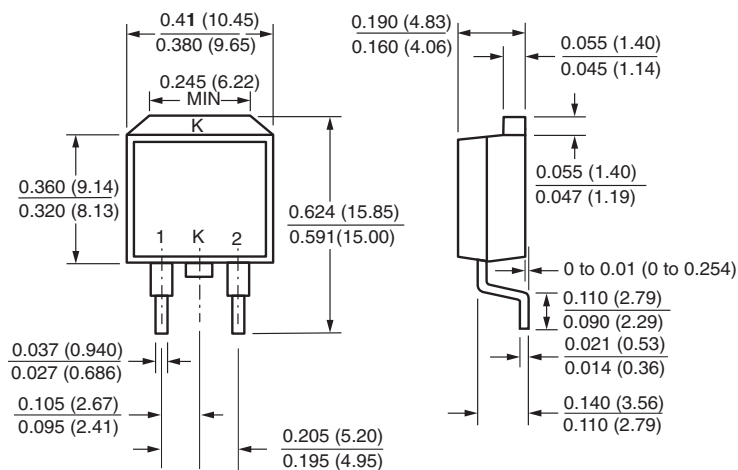
TO-220AB



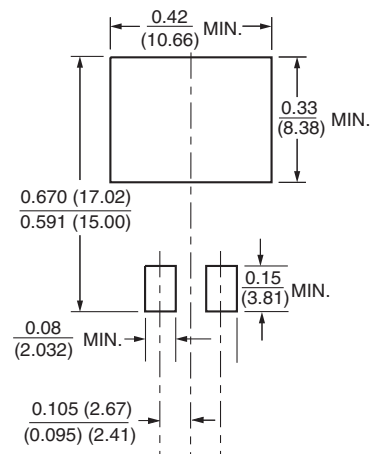




D²PAK (TO-263AB)



Mounting Pad Layout





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