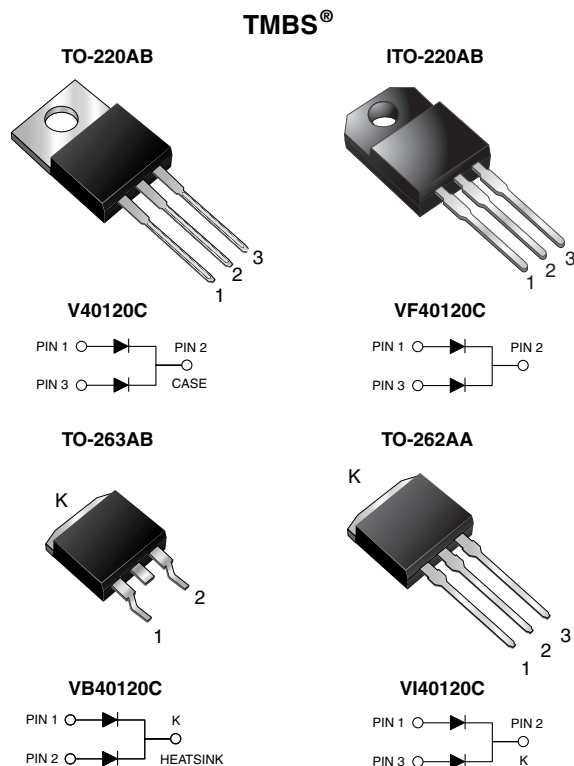




Dual High-Voltage Trench MOS Barrier Schottky Rectifier

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

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

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 ($T_A = 25\text{ °C}$ 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)	$I_{F(AV)}$	40 20				A
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 $T_J = 25\text{ °C}$, $L = 100\text{ mH}$ per diode	E_{AS}	180				mJ
Peak repetitive reverse current at $t_p = 2\text{ }\mu\text{s}$, 1 kHz, $T_J = 38\text{ °C} \pm 2\text{ °C}$ 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

V40120C, VF40120C, VB40120C & VI40120C

Vishay General Semiconductor

**ELECTRICAL CHARACTERISTICS** ($T_A = 25\text{ }^{\circ}\text{C}$ 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 ⁽¹⁾	I _F = 5 A	T _A = 25 °C	V _F	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 ⁽²⁾	V _R = 90 V	T _A = 25 °C	I _R	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

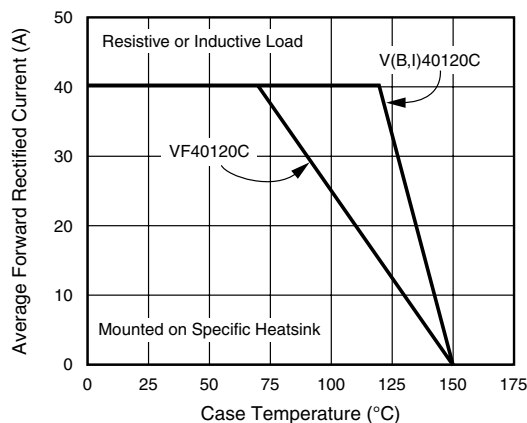
RATINGS AND CHARACTERISTICS CURVES($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)

Figure 1. Maximum Forward Current Derating Curve

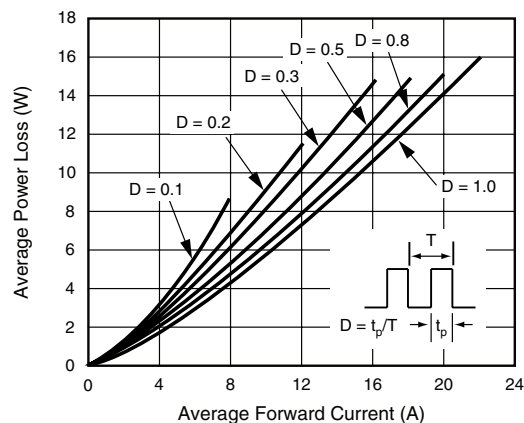


Figure 2. Forward Power Loss Characteristics Per Diode

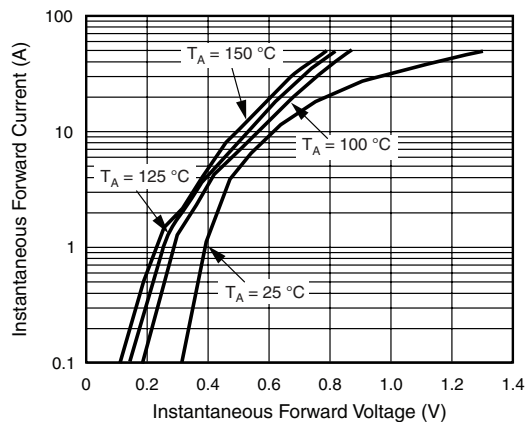


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

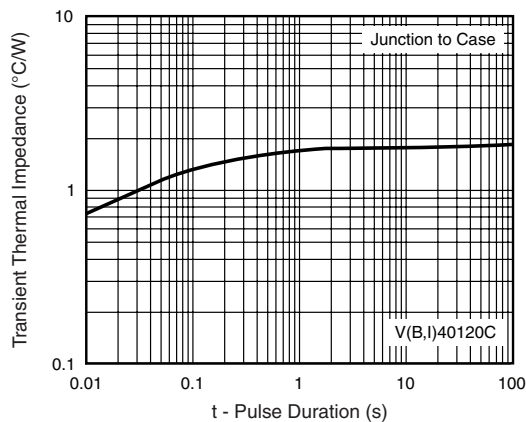


Figure 6. Typical Transient Thermal Impedance Per Diode

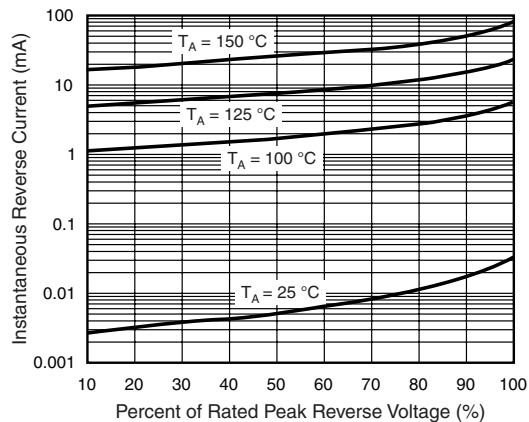


Figure 4. Typical Reverse Characteristics Per Diode

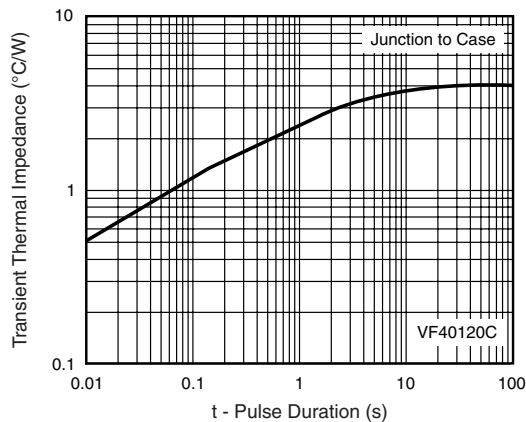


Figure 7. Typical Transient Thermal Impedance Per Diode

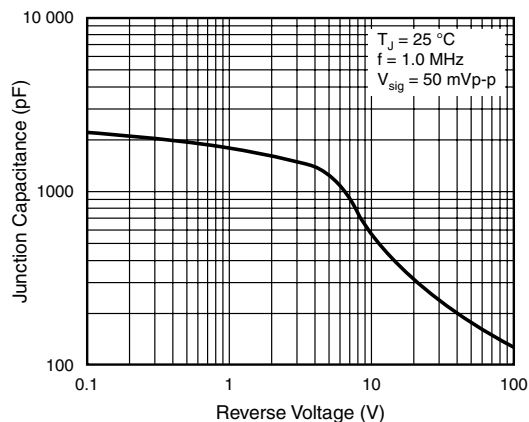


Figure 5. Typical Junction Capacitance Per Diode

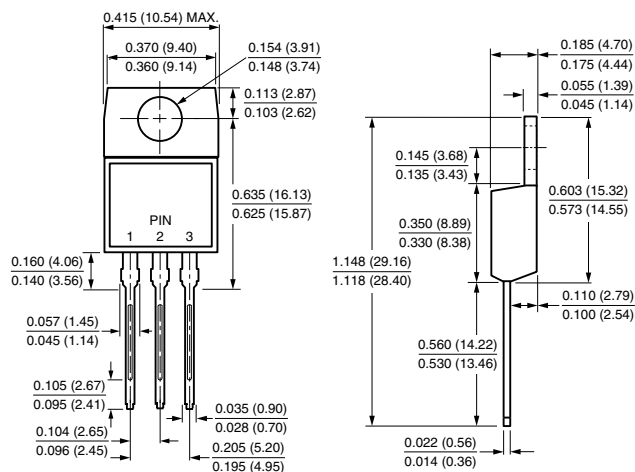
V40120C, VF40120C, VB40120C & VI40120C

Vishay General Semiconductor

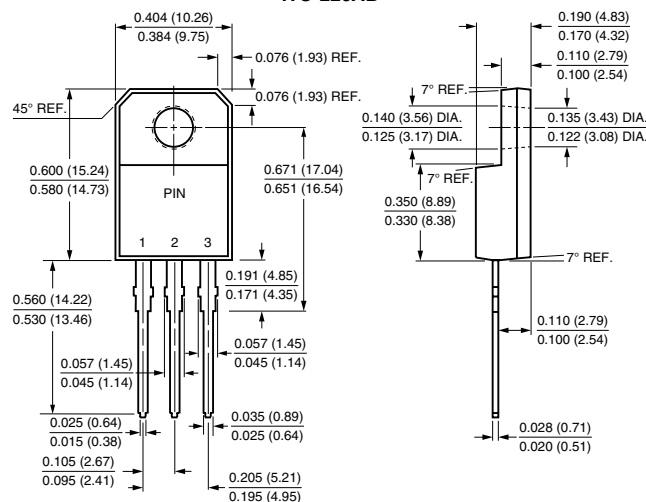


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

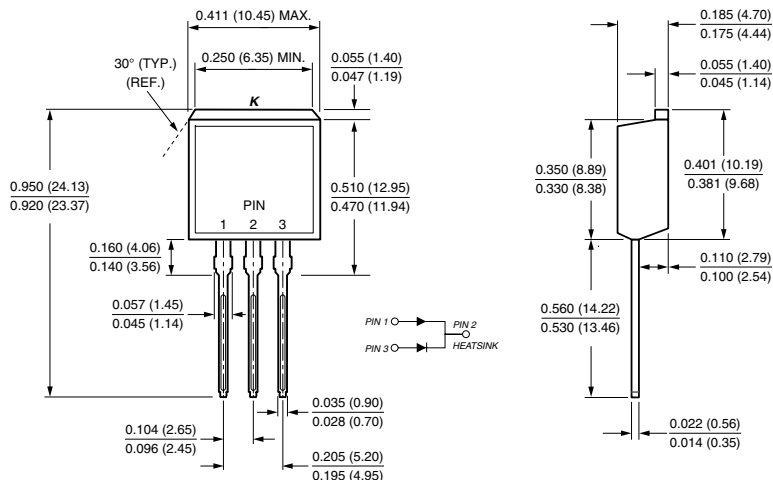
TO-220AB



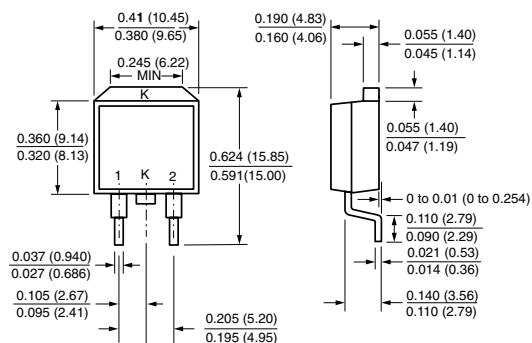
ITO-220AB



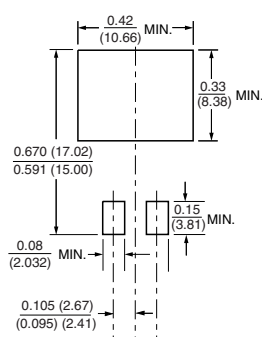
TO-262AA



TO-263AB



Mounting Pad Layout





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