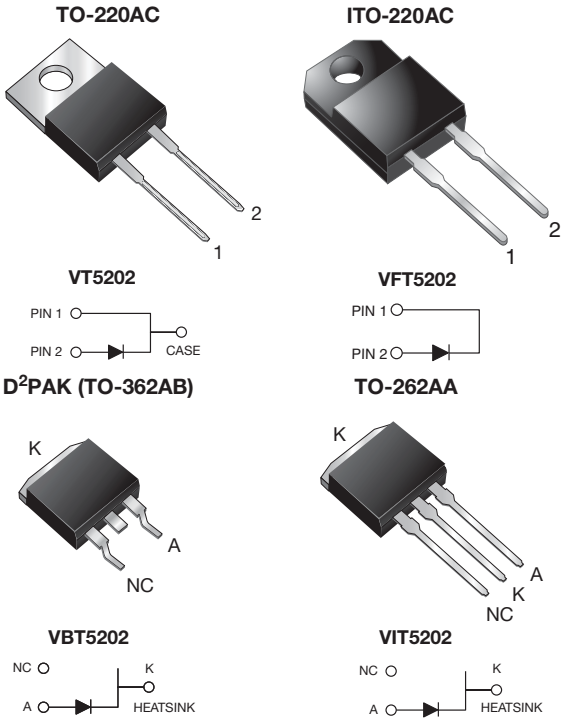
THE DATASHEET OF

VBT5202-M3/4W

TMBS® (Trench MOS Barrier Schottky) Rectifier

Ultra Low V_F = 0.58 V at I_F = 2.5 A



FEATURES

- Trench MOS Schottky technology Gen 2
- 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 D²PAK (TO-263AB) package)
- Solder bath temperature 275 °C max. 10 s, per JESD 22-B106 (for TO-220AC, ITO-220AC, and TO-262AA package)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT
HALOGEN FREE

TYPICAL APPLICATIONS

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

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, D²PAK (TO-263AB), and TO-262AA
Molding compound meets UL 94 V-0 flammability rating 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
M3 suffix meets JESD 201 class 1A whisker test

Polarity: as marked

Mounting Torque: 10 in-lbs max.

DESIGN SUPPORT TOOLS AVAILABLE

3D Models

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	5.0 A
V_{RRM}	200 V
I_{FSM}	100 A
V_F at I_F = 5.0 A (T_J = 125 °C)	0.65 V
T_J max.	175 °C
Package	TO-220AC, ITO-220AC, D²PAK (TO-263AB), TO-262AA
Circuit configuration	Single

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

PARAMETER	SYMBOL	VT5202	VFT5202	VBT5202	VIT5202	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	200				V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$	5.0				A
Maximum DC reverse voltage	V_{DC}	160				V
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	100				A
Voltage rate of change (rated V_R)	dV/dt	10 000				V/µs
Isolation voltage (ITO-220AC only) from terminal to heatsink, t = 1 min	V_{AC}	1500				V
Operating junction and storage temperature range	T_J, T_{STG}	-40 to +175				°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 = 2.5 A	T_A = 25 °C	V_F	0.74	-	V
	I_F = 5.0 A			0.80	0.88	
	I_F = 2.5 A	T_A = 125 °C		0.58	-	
	I_F = 5.0 A			0.65	0.73	
Reverse current (2)	V_R = 160 V	T_A = 25 °C	I_R	0.2	-	µA
		T_A = 125 °C		0.4	-	mA
	V_R = 200 V	T_A = 25 °C		-	150	µA
		T_A = 125 °C		1.0	5	mA

Notes

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

(2) Pulse test: Pulse width ≤ 5 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**VT5202**	**VFT5202**	**VBT5202**	**VIT5202**	**UNIT**
Typical thermal resistance	$R_{\theta JC}$	3.4	6.8	3.4		°C/W
	$R_{\theta JA}$ (1)(2)	52	60	52		

Notes

(1) The heat generated must be less than the thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$

(2) Free air, without heatsink

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	VT5202-M3/4W	1.89	4W	50/tube	Tube
ITO-220AC	VFT5202-M3/4W	1.65	4W	50/tube	Tube
D^2PAK (TO-263AB)	VBT5202-M3/4W	1.38	4W	50/tube	Tube
D^2PAK (TO-263AB)	VBT5202-M3/8W	1.38	8W	800/reel	Tape and reel
TO-262AA	VIT5202-M3/4W	1.46	4W	50/tube	Tube

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

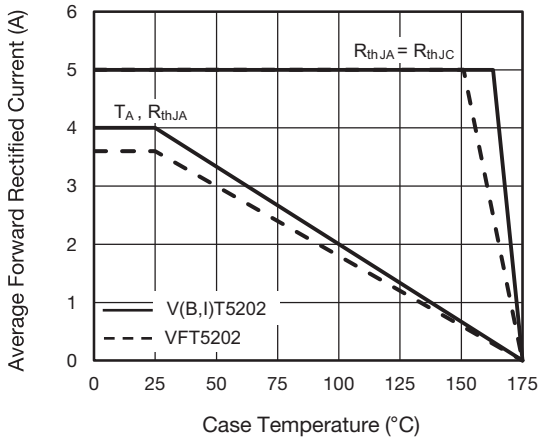


Fig. 1 - Maximum Forward Current Derating Curve

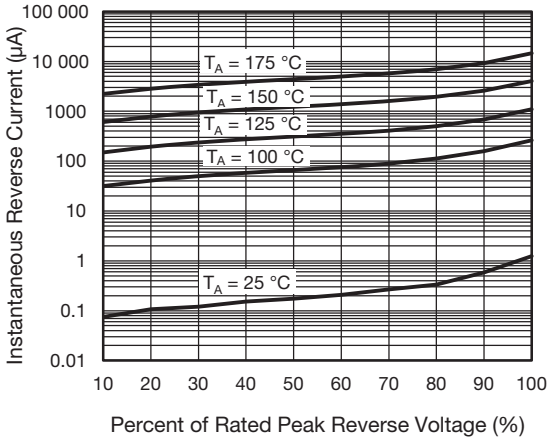


Fig. 4 - Typical Reverse Characteristics

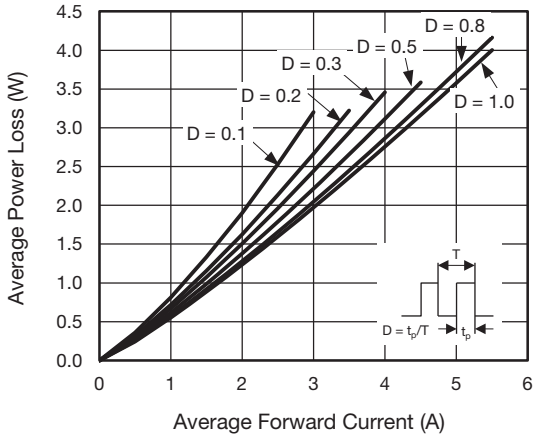


Fig. 2 - Forward Power Dissipation Characteristics

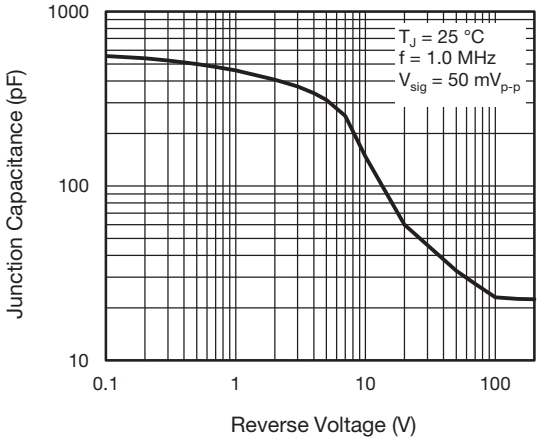


Fig. 5 - Typical Junction Capacitance

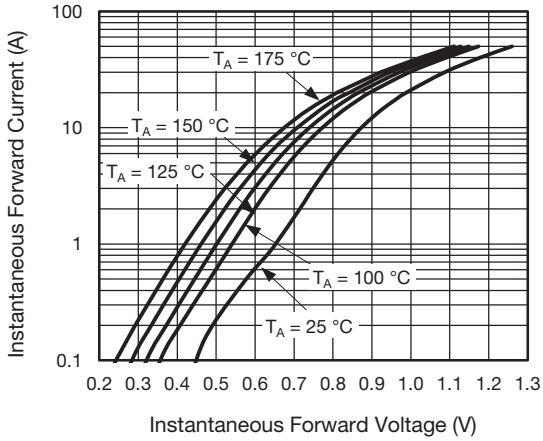


Fig. 3 - Typical Instantaneous Forward Characteristics

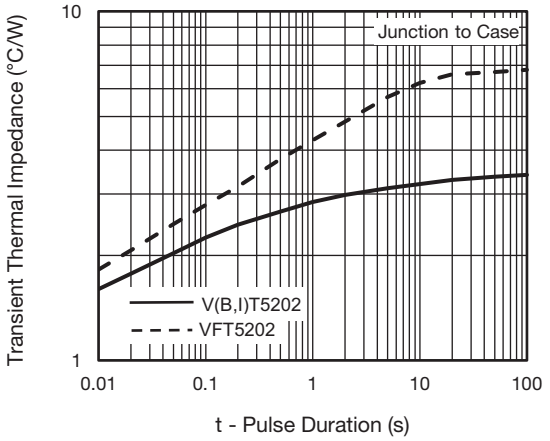
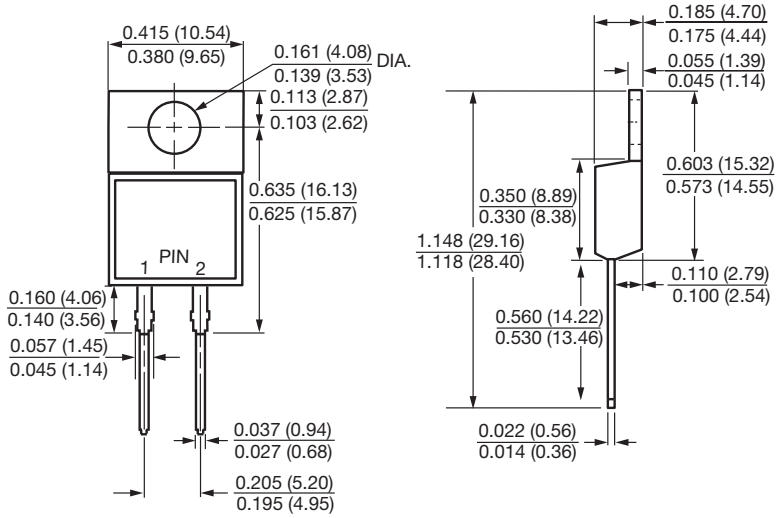


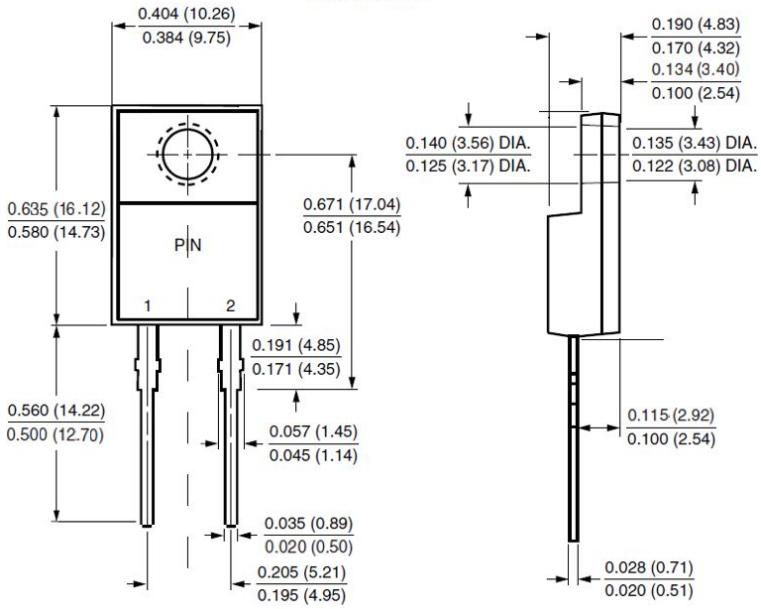
Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

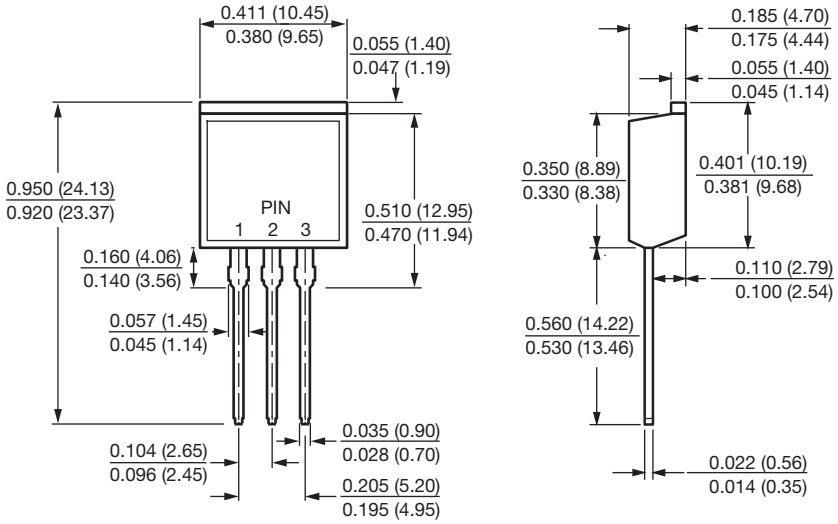
TO-220AC



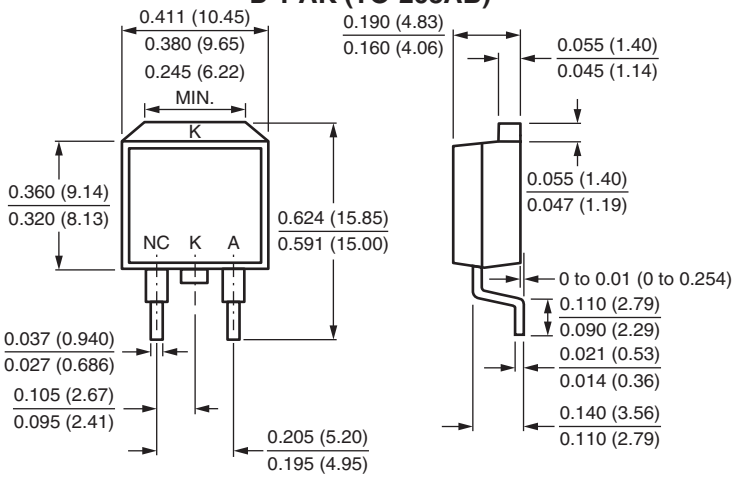
ITO-220AC



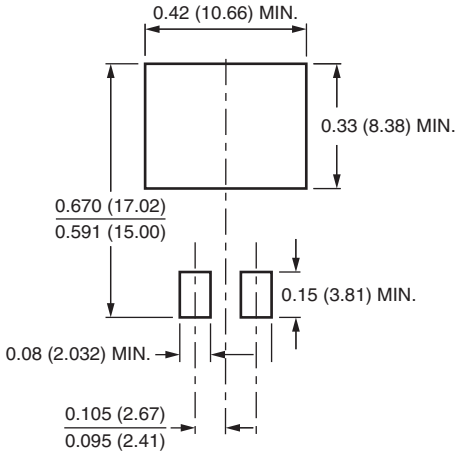
TO-262AA



D²PAK (TO-263AB)



Mounting Pad Layout



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