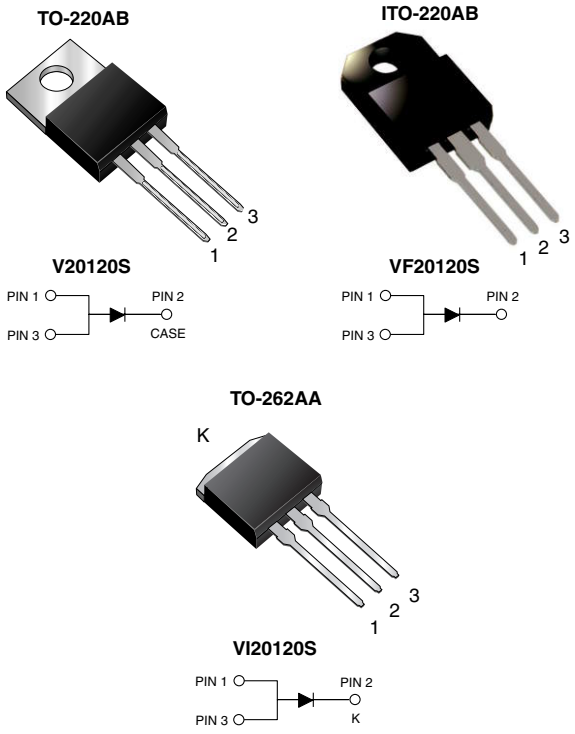
High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.491 V at I_F = 5 A



FEATURES

- Trench MOS Schottky Technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Low thermal resistance
- Solder Dip 260 °C, 40 seconds
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, free-wheeling diodes, oring diode, dc-to-dc converters and reverse battery protection.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB & TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002B and JESD22-B102D

E3 suffix for commercial grade

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAJOR RATINGS AND CHARACTERISTICS	
$I_{F(AV)}$	20 A
V_{RRM}	120 V
I_{FSM}	200 A
V_F at I_F = 20 A	0.726 V
T_j max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	V20120S	VF20120S	VI20120S	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	120			V
Maximum average forward rectified current (see Fig. 1)	$I_{F(AV)}$	20			A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	200			A
Peak repetitive reverse current per leg at t_p = 2 µs, 1 kHz	I_{RRM}	1.0			A
Voltage rate of change (rated V_R)	dv/dt	10000			V/µs
Isolation voltage (ITO-220AB only) From terminal to heatsink t = 1 minute	V_{AC}	1500			V
Operating junction temperature range	T_J	- 20 to + 150			°C
Storage temperature range	T_{STG}	- 40 to + 150			°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	at I_R = 1.0 mA	T_j = 25 °C	$V_{(BR)}$	120 (minimum)	-	V
Instantaneous forward voltage (1)	at I_F = 5 A I_F = 10 A I_F = 20 A	T_j = 25 °C	V_F	0.547 0.673 0.950	- - 1.03	
	at I_F = 5 A I_F = 10 A I_F = 20 A	T_j = 125 °C		0.491 0.600 0.726	- - 0.78	
Reverse current (1)	at V_R = 90 V	T_j = 25 °C T_j = 125 °C	I_R	19.3 10.3	- -	µA mA
	at V_R = 120 V	T_j = 25 °C T_j = 125 °C		51.7 19.5	300 30	µA mA

Note:

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

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**V20120S**	**VF20120S**	**VI20120S**	**UNIT**
Typical thermal resistance	$R_{\theta JC}$	2.2	4.0	2.2	°C/W

ORDERING INFORMATION					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V20120S-E3/4W	1.876	4W	50/Tube	Tube
ITO-220AB	VF20120S-E3/45	1.797	45	50/Tube	Tube
TO-262AA	VI20120S-E3/4W	1.451	4W	50/Tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

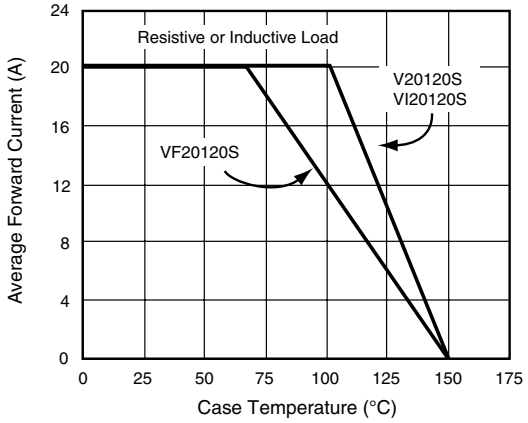


Figure 1. Maximum Forward Current Derating Curve

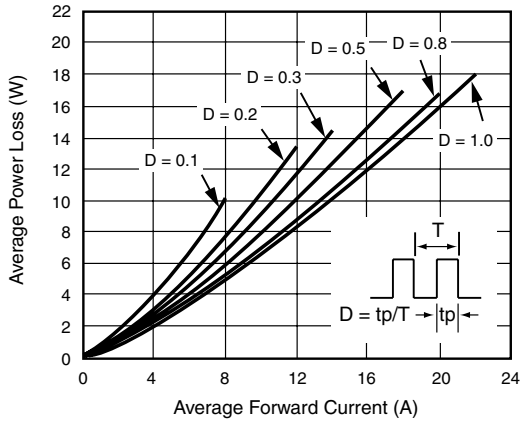


Figure 2. Forward Power Loss Characteristics

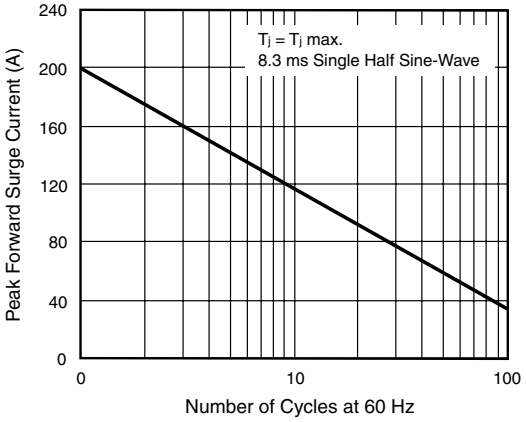


Figure 3. Maximum Non-Repetitive Peak Forward Surge Current

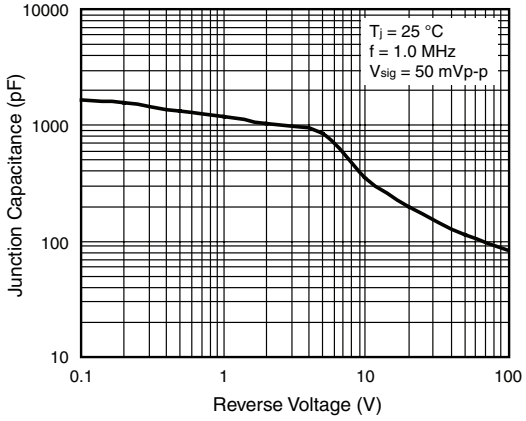


Figure 6. Typical Junction Capacitance

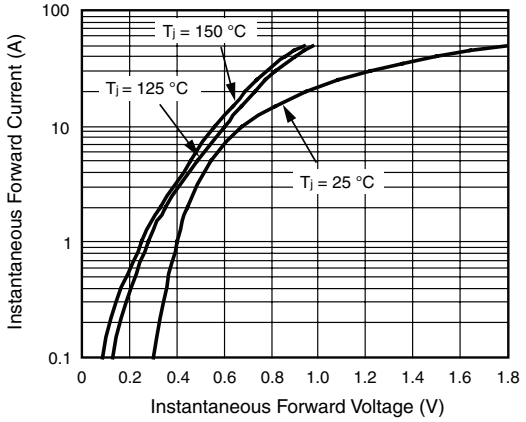


Figure 4. Typical Instantaneous Forward Characteristics

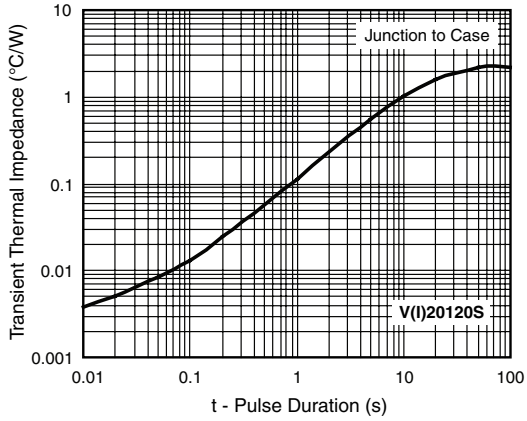


Figure 7. Typical Transient Thermal Impedance

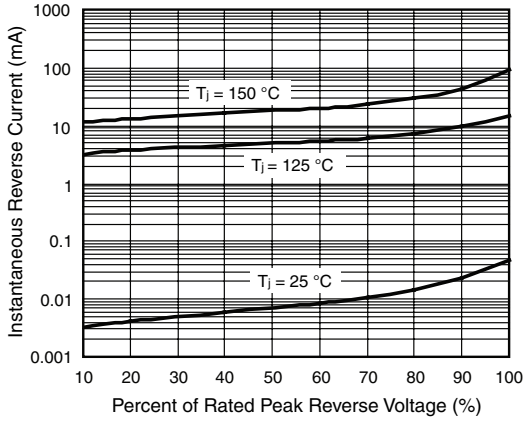


Figure 5. Typical Reverse Characteristics

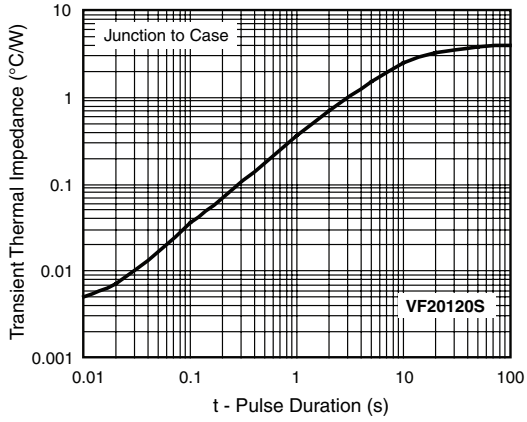
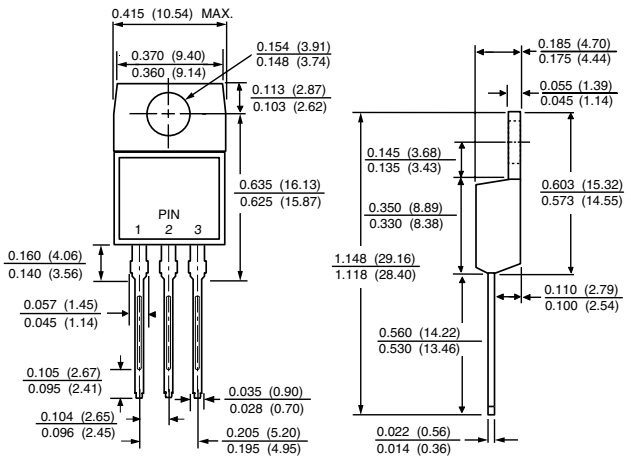


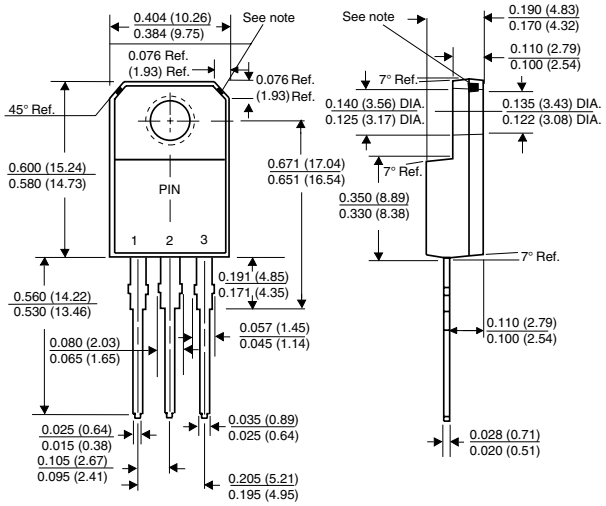
Figure 8. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AB

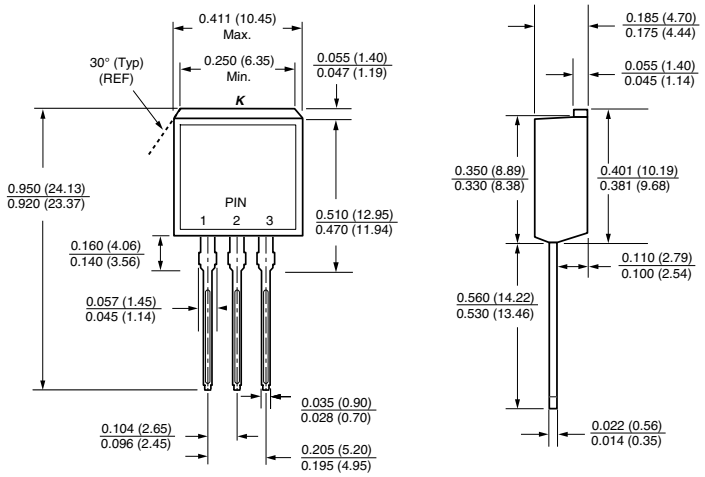


ITO-220AB



Note: Copper exposure is allowable for 0.005 (0.13) Max. from the body

TO-262AA



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