

High-Voltage Trench MOS Barrier Schottky Rectifier

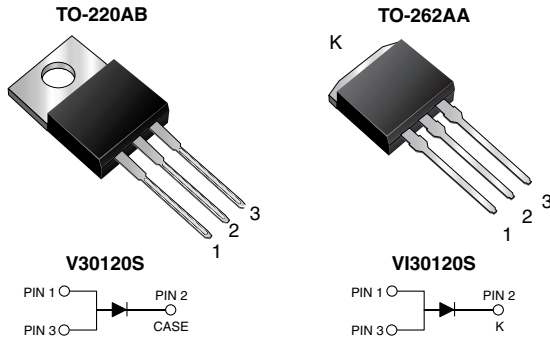
 Ultra Low $V_F = 0.402$ V at $I_F = 5$ A

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.


MAJOR RATINGS AND CHARACTERISTICS

$I_{F(AV)}$	30 A
V_{RRM}	120 V
I_{FSM}	300 A
V_F at $I_F = 30$ A	0.70 V
T_j max.	150 °C

MECHANICAL DATA
Case: TO-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

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

PARAMETER	SYMBOL	V30120S	VI30120S	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	120		V
Maximum average forward rectified current (see Fig. 1)	$I_{F(AV)}$	30		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	300		A
Peak repetitive reverse current per leg at $t_p = 2$ μ s, 1 kHz	I_{RRM}	1.0		A
Voltage rate of change (rated V_R)	dv/dt	10000		V/ μ s
Operating junction and storage temperature range	T_J, T_{STG}	- 20 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 $I_F = 15$ A $T_j = 25$ °C $I_F = 30$ A	V_F	0.478	-	V
	at $I_F = 5$ A $I_F = 15$ A $T_j = 125$ °C $I_F = 30$ A		0.648	-	
			0.854	0.95	
			0.402	-	
			0.582	-	
			0.698	0.75	

ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS	SYMBOL	TYP.	MAX.	UNIT	
Reverse current ⁽¹⁾	at $V_R = 90\text{ V}$	I_R	$T_J = 25\text{ }^\circ\text{C}$	14.2	-	μA
			$T_J = 125\text{ }^\circ\text{C}$	11.3	-	mA
	at $V_R = 120\text{ V}$		$T_J = 25\text{ }^\circ\text{C}$	47.3	500	μA
			$T_J = 125\text{ }^\circ\text{C}$	23.5	35	mA

Note:

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

THERMAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)				
PARAMETER	SYMBOL	V30120S	VI30120S	UNIT
Typical thermal resistance	$R_{\theta JC}$	2.2		$^\circ\text{C/W}$

ORDERING INFORMATION					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-220AB	V30120S-E3/45	1.884	45	50/Tube	Tube
TO-262AA	VI30120S-E3/4W	1.456	4W	50/Tube	Tube

RATINGS AND CHARACTERISTICS CURVES

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

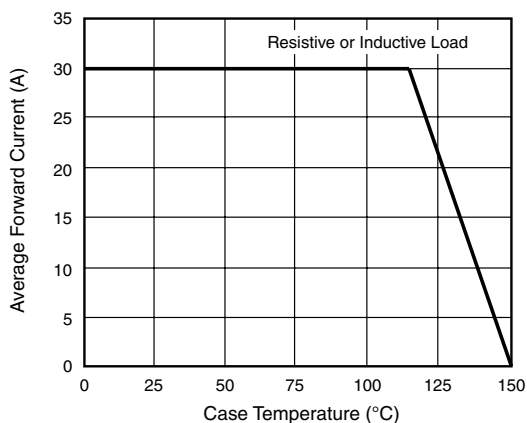


Figure 1. Forward Current Derating Curve

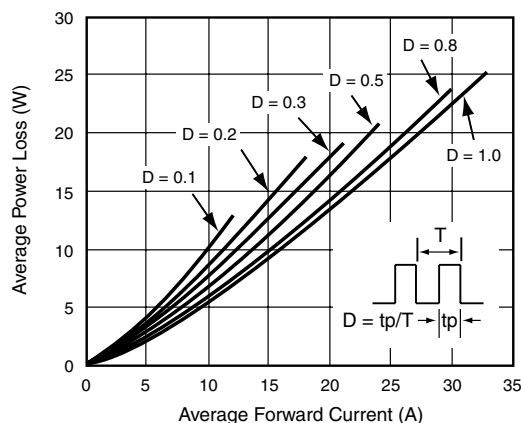


Figure 2. Forward Power Loss Characteristics

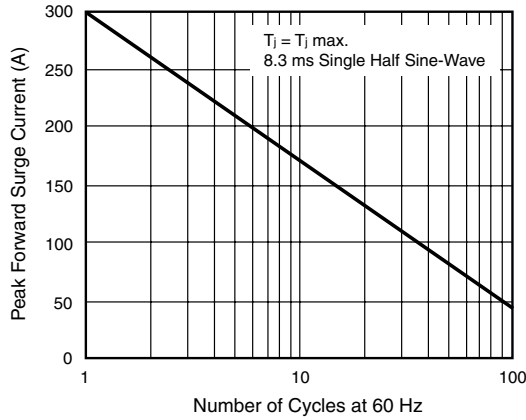


Figure 3. Maximum Non-Repetitive Peak Forward Surge Current

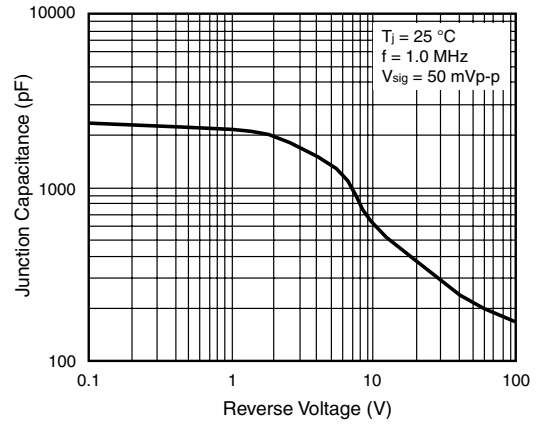


Figure 6. Typical Junction Capacitance

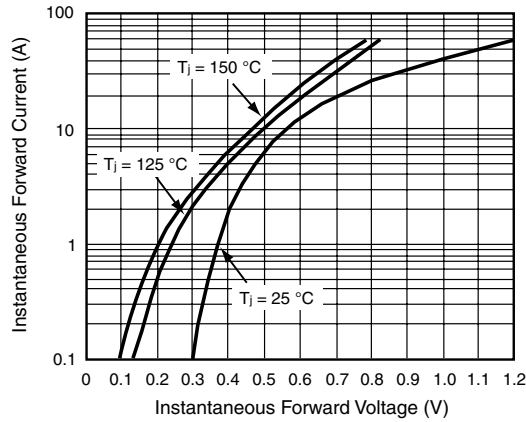


Figure 4. Typical Instantaneous Forward Characteristics

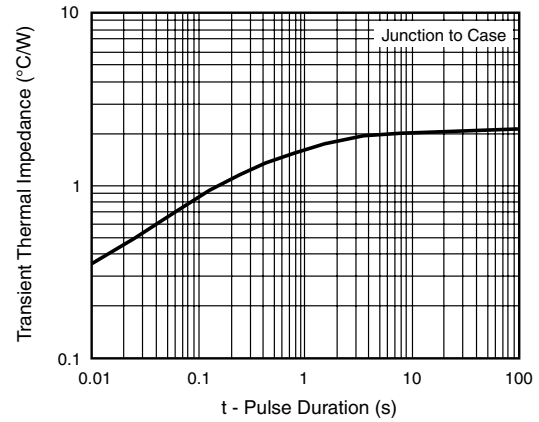


Figure 7. Typical Transient Thermal Impedance

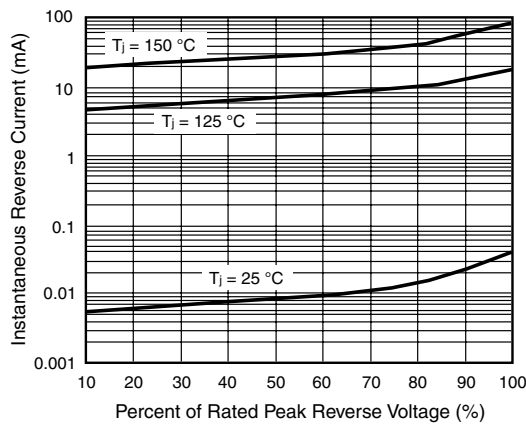
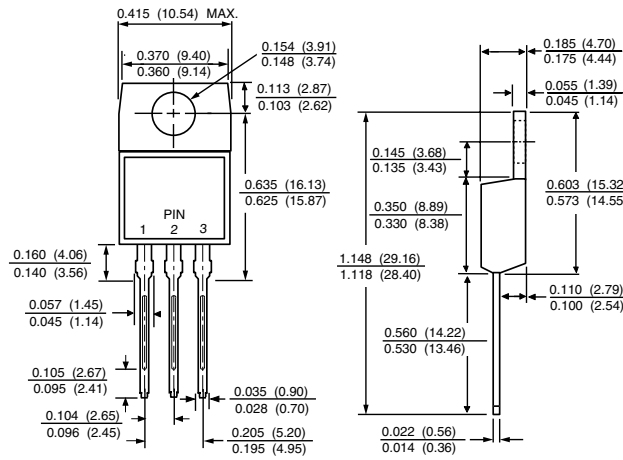


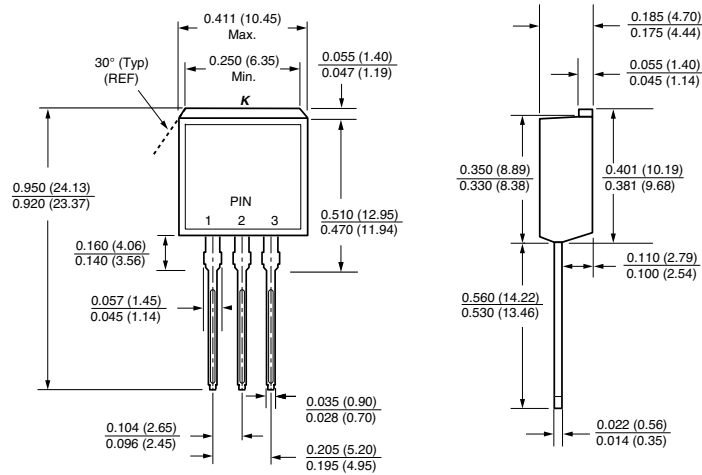
Figure 5. Typical Reverse Leakage Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AB



TO-262AA





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