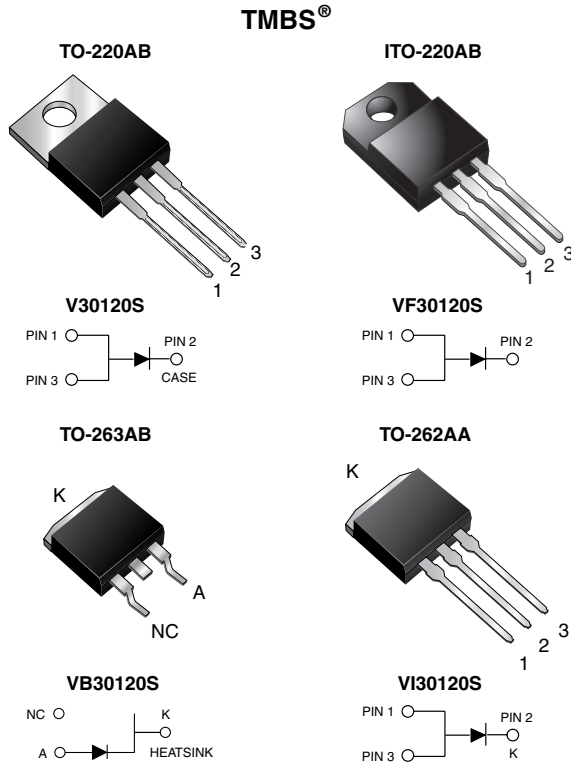


## High-Voltage Trench MOS Barrier Schottky Rectifier

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



### 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 dip 260 °C, 40 s (for TO-220AB, ITO-220AB and TO-262AA package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



**RoHS**  
COMPLIANT

### TYPICAL APPLICATIONS

For use in high frequency inverters, 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

Epoxy meets UL 94V-0 flammability rating

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for commercial grade, meets JESD 201 class 1A whisker test

**Polarity:** As marked

**Mounting Torque:** 10 in-lbs maximum

### PRIMARY CHARACTERISTICS

$I_{F(AV)}$	30 A
$V_{RRM}$	120 V
$I_{FSM}$	300 A
$V_F$ at $I_F = 30 \text{ A}$	0.74 V
$T_J \text{ max.}$	150 °C

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

PARAMETER	SYMBOL	V30120S	VF30120S	VB30120S	VI30120S	UNIT
Maximum repetitive peak reverse voltage	$V_{RRM}$	120				V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	30				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	$I_{FSM}$	300				A
Isolation voltage (ITO-220AB only) from terminal to heatsink $t = 1 \text{ min}$	$V_{AC}$	1500				V
Operating junction and storage temperature range	$T_J, T_{STG}$	- 40 to + 150				°C

ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Breakdown voltage	I <sub>R</sub> = 1.0 mA	T <sub>A</sub> = 25 °C	V <sub>BR</sub>	120 (minimum)	-	V
Instantaneous forward voltage <sup>(1)</sup>	I <sub>F</sub> = 5 A I <sub>F</sub> = 15 A I <sub>F</sub> = 30 A	T <sub>A</sub> = 25 °C	V <sub>F</sub>	0.50 0.70 0.99	- - 1.10	V
	I <sub>F</sub> = 5 A I <sub>F</sub> = 15 A I <sub>F</sub> = 30 A	T <sub>A</sub> = 125 °C		0.43 0.60 0.74	- - 0.82	
Reverse current <sup>(2)</sup>	V <sub>R</sub> = 90 V	T <sub>A</sub> = 25 °C T <sub>A</sub> = 125 °C	I <sub>R</sub>	18 12	- -	μA mA
	V <sub>R</sub> = 120 V	T <sub>A</sub> = 25 °C T <sub>A</sub> = 125 °C		- 22	500 35	μA mA

**Notes:**

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
- (2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	SYMBOL	V30120S	VF30120S	VB30120S	VI30120S	UNIT
Typical thermal resistance per diode	R <sub>θJC</sub>	1.6	4	1.6	1.6	°C/W

ORDERING INFORMATION (Example)						
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE	
TO-220AB	V30120S-E3/4W	1.88	4W	50/tube	Tube	
ITO-220AB	VF30120S-E3/4W	1.76	4W	50/tube	Tube	
TO-263AB	VB30120S-E3/4W	1.39	4W	50/tube	Tube	
TO-263AB	VB30120S-E3/8W	1.39	8W	800/reel	Tape and reel	
TO-262AA	VI30120S-E3/4W	1.46	4W	50/tube	Tube	

## RATINGS AND CHARACTERISTICS CURVES

(T<sub>A</sub> = 25 °C unless otherwise noted)

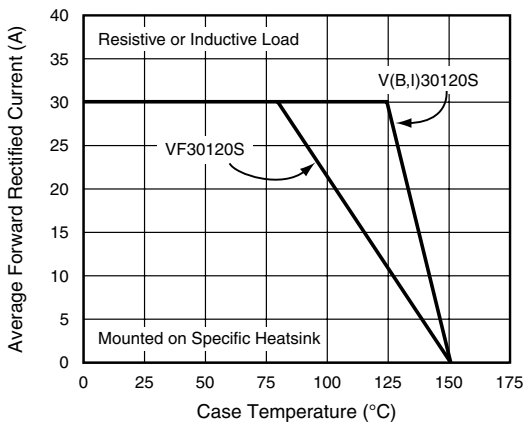


Figure 1. Forward Current Derating Curve

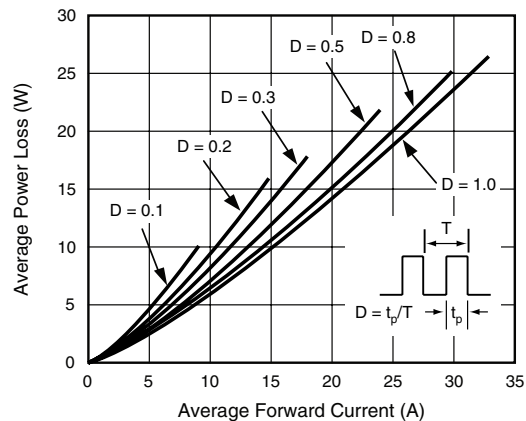


Figure 2. Forward Power Loss Characteristics Per Diode

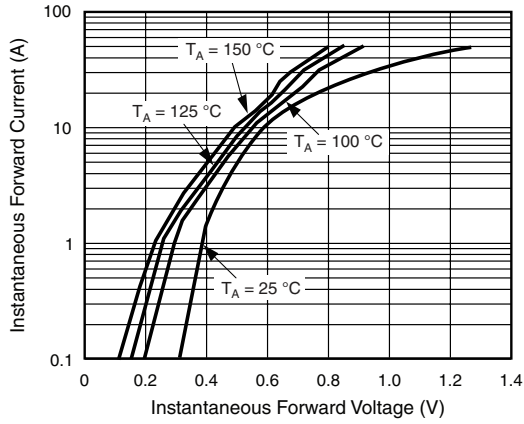


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

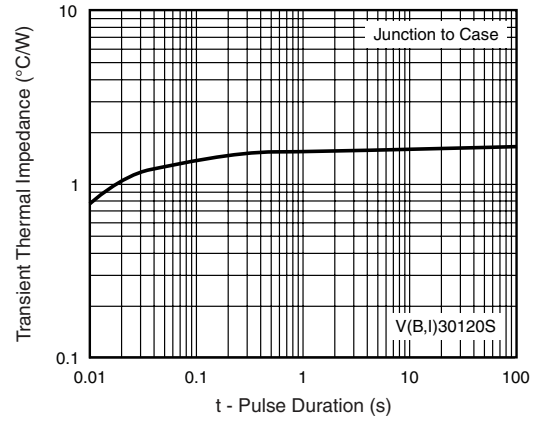


Figure 6. Typical Transient Thermal Impedance Per Diode

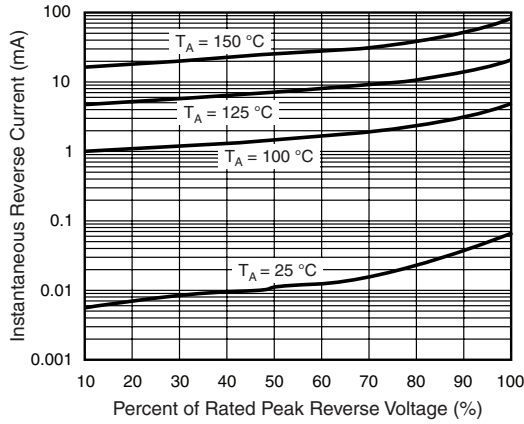


Figure 4. Typical Reverse Characteristics Per Diode

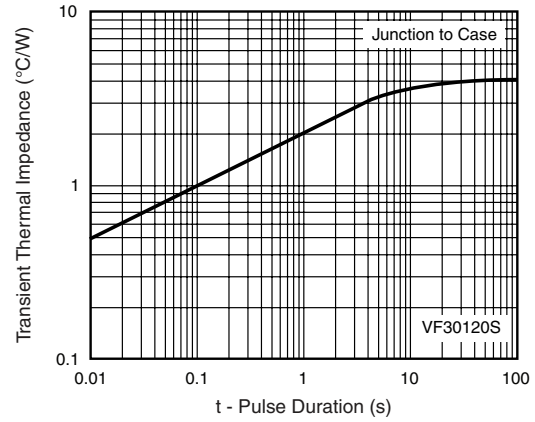


Figure 7. Typical Transient Thermal Impedance Per Diode

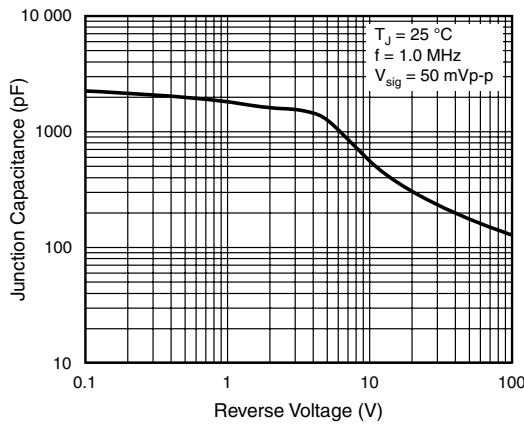
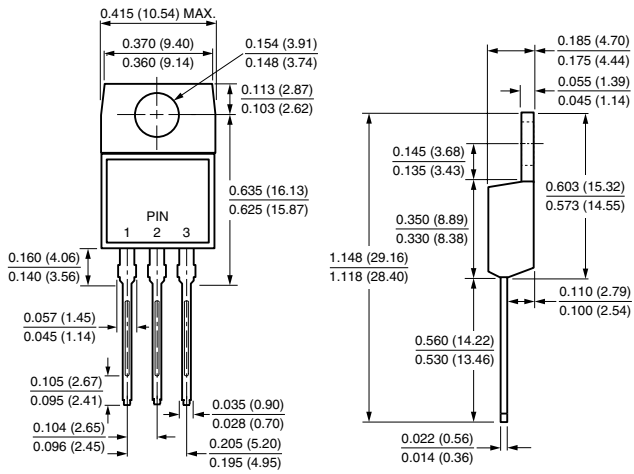


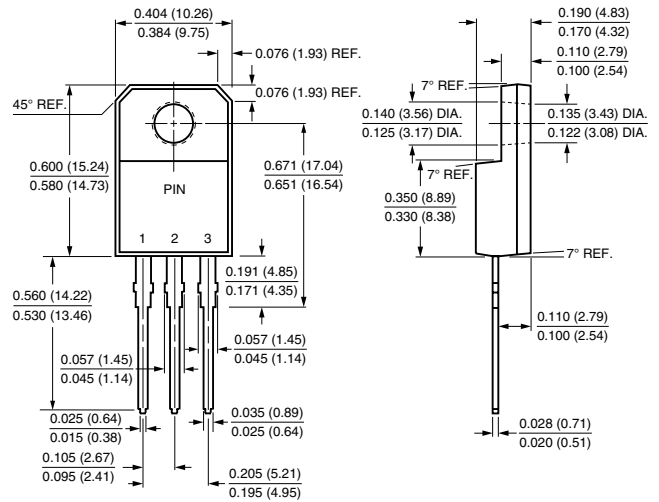
Figure 5. Typical Junction Capacitance Per Diode

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

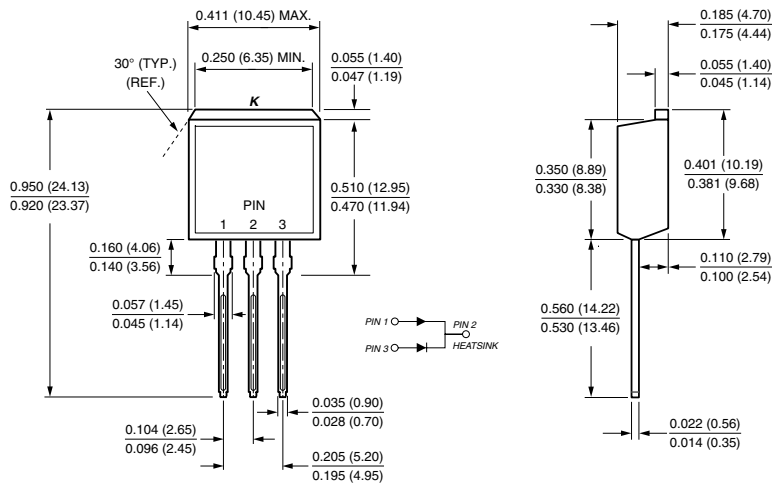
**TO-220AB**



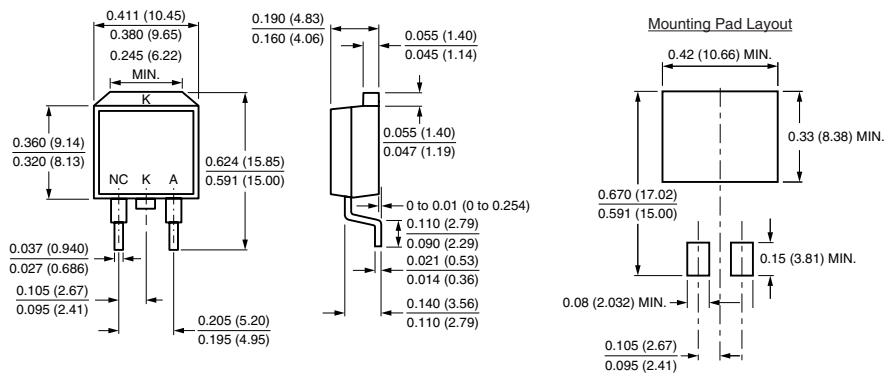
**ITO-220AB**



**TO-262AA**



**TO-263AB**





## Disclaimer

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