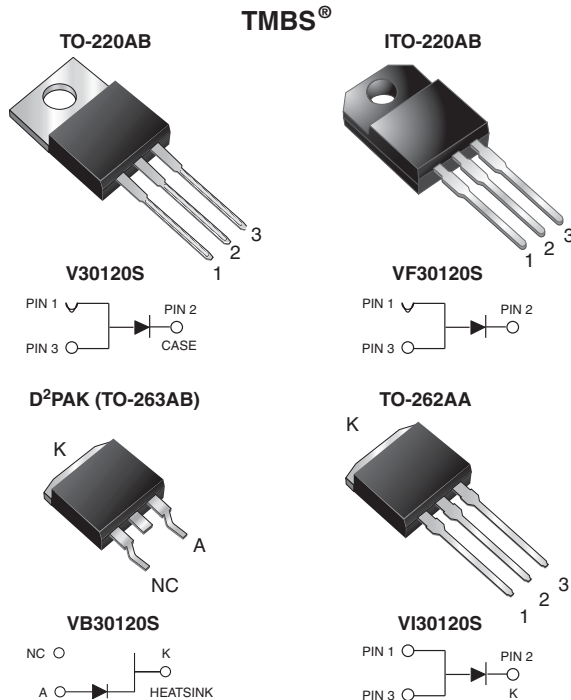


## High Voltage Trench MOS Barrier Schottky Rectifier

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 bath temperature 275 °C maximum, 10 s, per JESD 22-B106 (for TO-220AB, ITO-220AB, and TO-262AA package)
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT

### TYPICAL APPLICATIONS

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

### MECHANICAL DATA

**Case:** TO-220AB, ITO-220AB, D<sup>2</sup>PAK (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

### DESIGN SUPPORT TOOLS

[click logo to get started](#)

**3D**  
Models  
Available

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
$T_J$ max.	150 °C
Package	TO-220AB, ITO-220AB, D <sup>2</sup> PAK (TO-263AB), TO-262AA
Circuit configuration	Single

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
Non-repetitive avalanche energy at $T_J = 25\text{ °C}$ , $L = 100\text{ mH}$	$E_{AS}$			180		mJ
Peak repetitive reverse current at $t_p = 2\text{ }\mu\text{s}$ , 1 kHz, $T_J = 38\text{ °C} \pm 2\text{ °C}$	$I_{RRM}$			0.5		A
Voltage rate of change (rated $V_R$ )	$dV/dt$			10 000		V/ $\mu\text{s}$
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 ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage per diode <sup>(1)</sup>	$I_F = 5\text{ A}$	$T_A = 25\text{ }^\circ\text{C}$	$V_F$	0.50	-	V
	$I_F = 15\text{ A}$			0.70	-	
	$I_F = 30\text{ A}$			0.99	1.10	
	$I_F = 5\text{ A}$	$T_A = 125\text{ }^\circ\text{C}$		0.43	-	
	$I_F = 15\text{ A}$			0.60	-	
	$I_F = 30\text{ A}$			0.74	0.82	
Reverse current per diode <sup>(2)</sup>	$V_R = 90\text{ V}$	$T_A = 25\text{ }^\circ\text{C}$	$I_R$	18	-	$\mu\text{A}$
				$T_A = 125\text{ }^\circ\text{C}$	12	-
		$V_R = 120\text{ V}$		$T_A = 25\text{ }^\circ\text{C}$	-	500
	$T_A = 125\text{ }^\circ\text{C}$			22	35	mA

**Notes**

- (1) Pulse test: 300  $\mu\text{s}$  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	V30120S	VF30120S	VB30120S	VI30120S	UNIT
Typical thermal resistance per diode	$R_{\theta JC}$	1.6	4.0	1.6	1.6	$^\circ\text{C/W}$

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	1.75	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

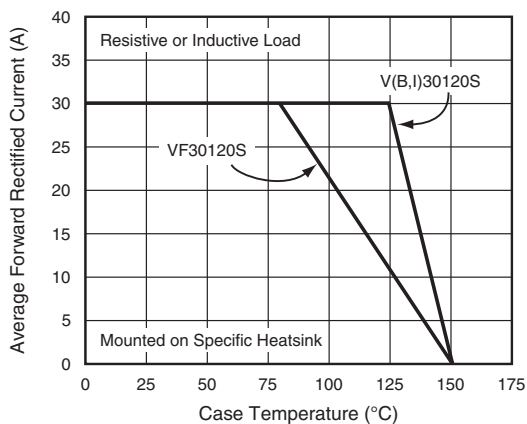
**RATINGS AND CHARACTERISTICS CURVES ( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)**


Fig. 1 - Forward Current Derating Curve

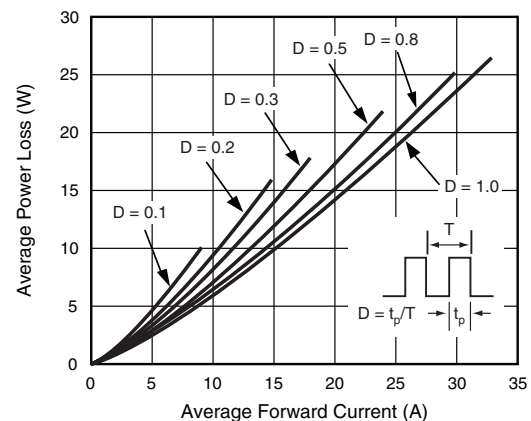


Fig. 2 - Forward Power Loss Characteristics Per Diode

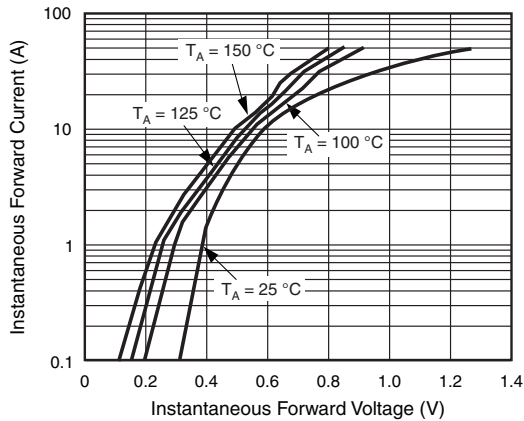


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

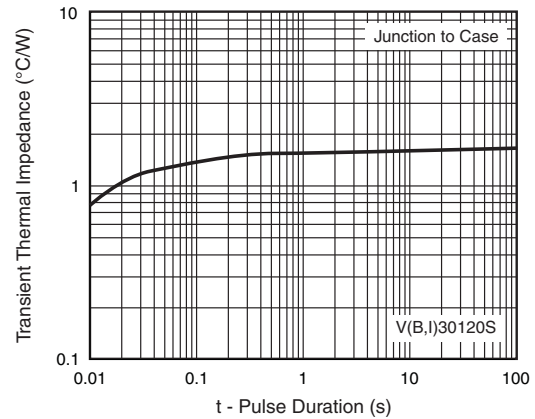


Fig. 6 - Typical Transient Thermal Impedance Per Diode

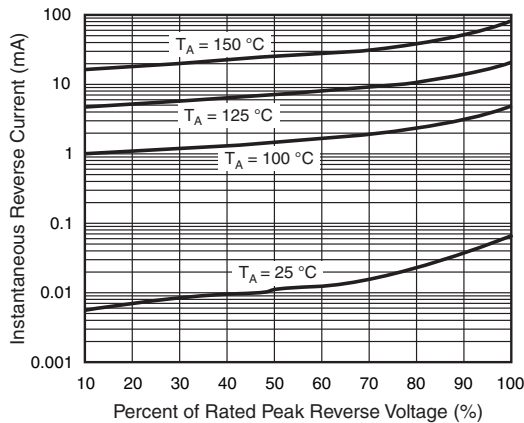


Fig. 4 - Typical Reverse Characteristics Per Diode

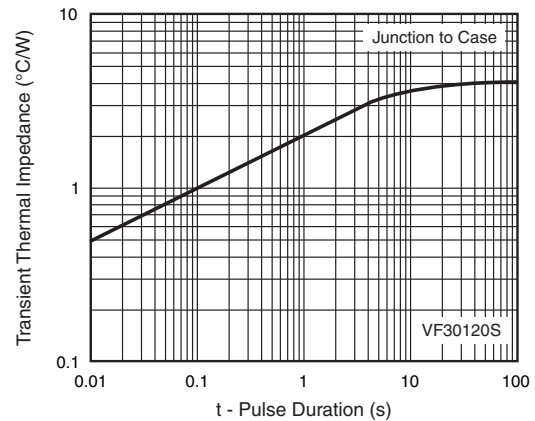


Fig. 7 - Typical Transient Thermal Impedance Per Diode

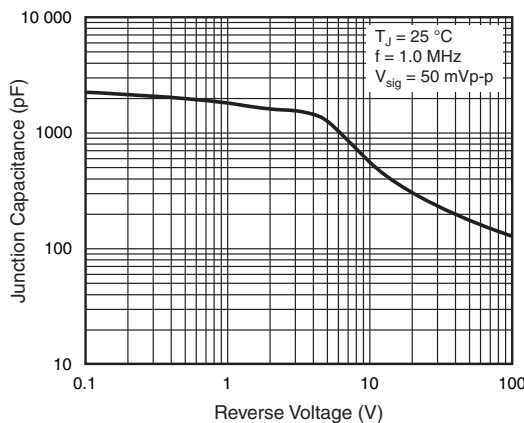
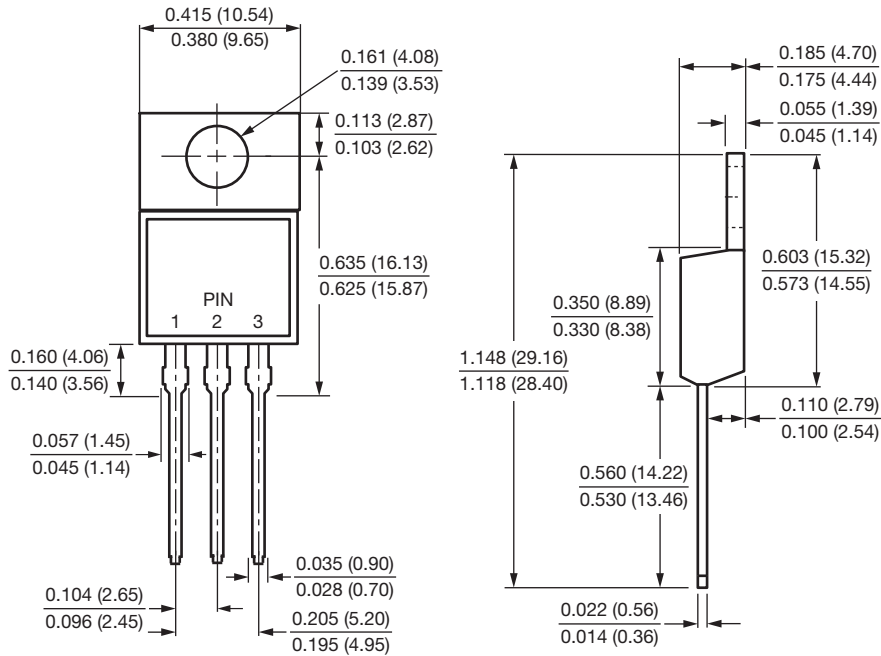


Fig. 5 - Typical Junction Capacitance Per Diode

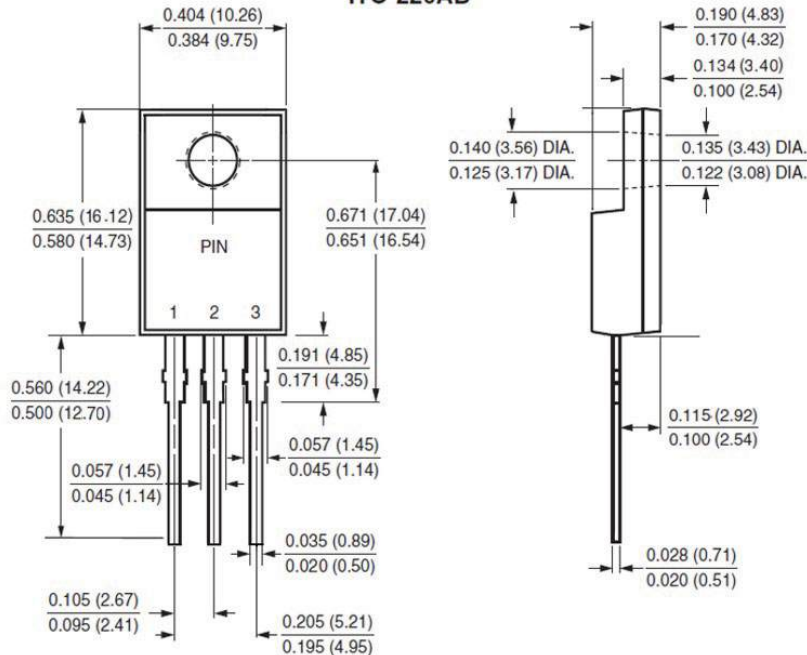


## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

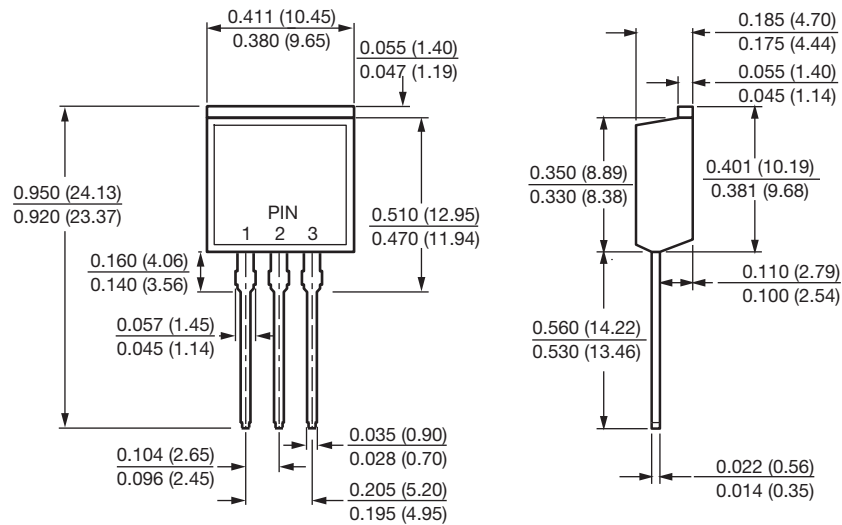
### TO-220AB



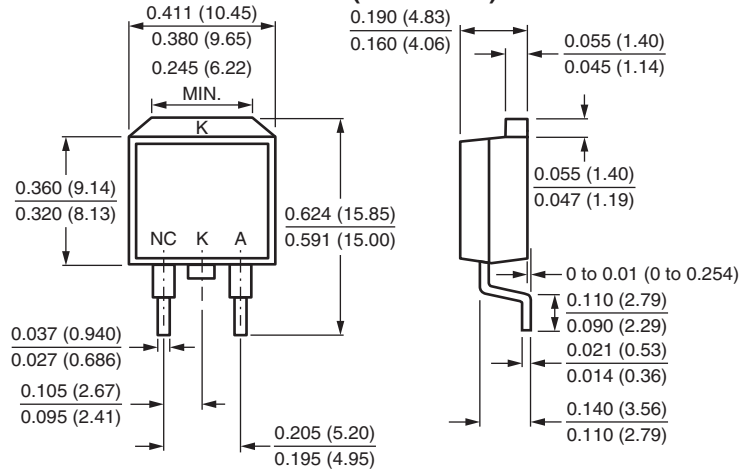
### ITO-220AB



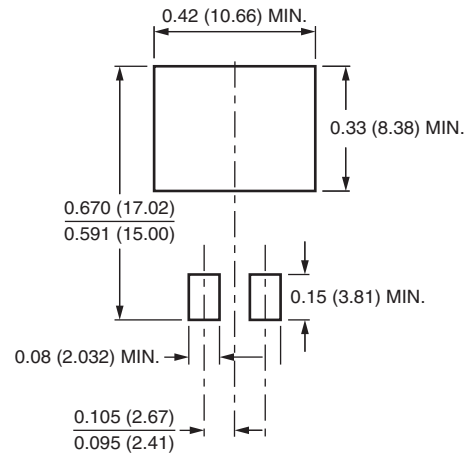
## TO-262AA



## D<sup>2</sup>PAK (TO-263AB)



## Mounting Pad Layout





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