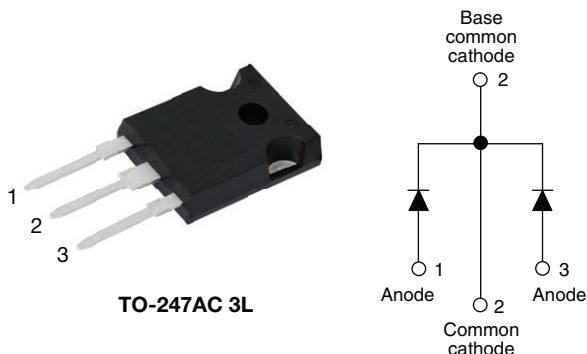


# High Performance Schottky Rectifier, 2 x 15 A



**RoHS**  
COMPLIANT  
**HALOGEN**  
**FREE**

## FEATURES

- 150 °C T<sub>J</sub> operation
- Very low forward voltage drop
- High frequency operation
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Guard ring for enhanced ruggedness and long term reliability
- Designed and qualified according to JEDEC®-JESD 47
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

## DESCRIPTION

The VS-30CPQ... center tap Schottky rectifier has been optimized for very low forward voltage drop, with moderate leakage. The proprietary barrier technology allows for reliable operation up to 150 °C junction temperature. Typical applications are in switching power supplies, converters, freewheeling diodes, and reverse battery protection.

## PRIMARY CHARACTERISTICS

I <sub>F(AV)</sub>	2 x 15 A
V <sub>R</sub>	50 V, 60 V
V <sub>F</sub> at I <sub>F</sub>	0.56 V
I <sub>RM</sub> typ.	45 mA at 125 °C
T <sub>J</sub> max.	150 °C
E <sub>AS</sub>	13 mJ
Package	TO-247AC 3L
Circuit configuration	Common cathode

## MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
I <sub>F(AV)</sub>	Rectangular waveform	30	A
V <sub>RRM</sub>		50/60	V
I <sub>FSM</sub>	t <sub>p</sub> = 5 μs sine	1020	A
V <sub>F</sub>	15 A <sub>pk</sub> , T <sub>J</sub> = 125 °C (per leg)	0.56	V
T <sub>J</sub>		-55 to +150	°C

## VOLTAGE RATINGS

PARAMETER	SYMBOL	VS-30CPQ050-N3	VS-30CPQ060-N3	UNITS
Maximum DC reverse voltage	V <sub>R</sub>	50	60	V
Maximum working peak reverse voltage	V <sub>RWM</sub>			

## ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current See fig. 5	I <sub>F(AV)</sub>	50 % duty cycle at T <sub>C</sub> = 112 °C, rectangular waveform	30	A
Maximum peak one cycle non-repetitive surge current per leg See fig. 7	I <sub>FSM</sub>	5 μs sine or 3 μs rect. pulse	1020	
		10 ms sine or 6 ms rect. pulse	265	
Non-repetitive avalanche energy per leg	E <sub>AS</sub>	T <sub>J</sub> = 25 °C, I <sub>AS</sub> = 1.50 A, L = 11.5 mH	13	mJ
Repetitive avalanche current per leg	I <sub>AR</sub>	Current decaying linearly to zero in 1 μs Frequency limited by T <sub>J</sub> maximum V <sub>A</sub> = 1.5 x V <sub>R</sub> typical	1.50	A

**ELECTRICAL SPECIFICATIONS**

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop per leg See fig. 1	$V_{FM}^{(1)}$	15 A	$T_J = 25\text{ }^{\circ}\text{C}$	0.60	V
		30 A		0.80	
		15 A	$T_J = 125\text{ }^{\circ}\text{C}$	0.56	
		30 A		0.70	
Maximum reverse leakage current per leg	$I_{RM}^{(1)}$	$T_J = 25\text{ }^{\circ}\text{C}$	$V_R = \text{Rated } V_R$	0.80	mA
		$T_J = 125\text{ }^{\circ}\text{C}$		160	
Typical reverse leakage current per leg	$I_{RM}^{(1)}$	$T_J = 125\text{ }^{\circ}\text{C}$	$V_R = \text{Rated } V_R$	45	mA
Maximum junction capacitance per leg	$C_T$	$V_R = 5\text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz) $25\text{ }^{\circ}\text{C}$		720	pF
Typical series inductance per leg	$L_S$	Measured lead to lead 5 mm from package body		7.5	nH
Maximum voltage rate of change	$dV/dt$	Rated $V_R$		10 000	V/ $\mu$ s

**Note**(1) Pulse width < 300  $\mu$ s, duty cycle < 2 %**THERMAL - MECHANICAL SPECIFICATIONS**

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction and storage temperature range	T <sub>J</sub> , T <sub>Stg</sub>		-55 to 150	°C
Maximum thermal resistance, junction to case per leg	R <sub>thJC</sub>	DC operation See fig. 4	2.20	°C/W
Maximum thermal resistance, junction to case per package		DC operation	1.10	
Typical thermal resistance, case to heatsink	R <sub>thCS</sub>	Mounting surface, smooth and greased	0.24	
Approximate weight			6	g
			0.21	oz.
Mounting torque	minimum	Non-lubricated threads	6 (5)	kgf · cm (lbf · in)
	maximum		12 (10)	
Marking device		Case style TO-247AC 3L	30CPQ050	
			30CPQ060	

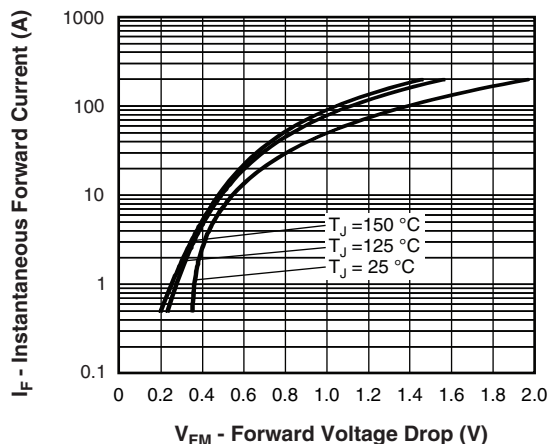


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

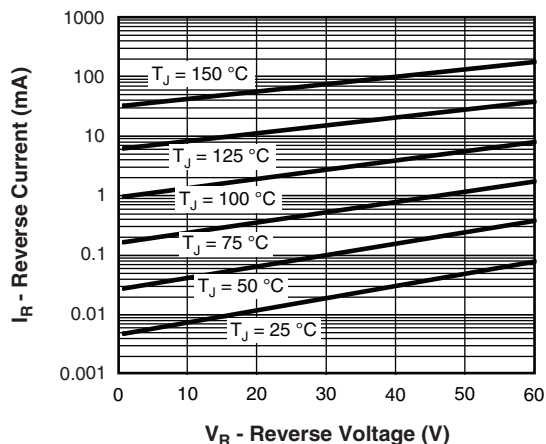


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

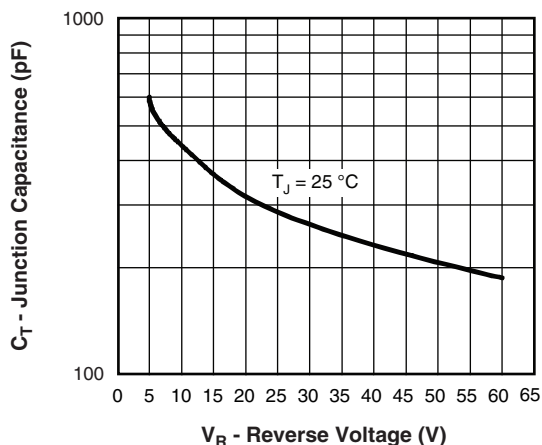


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

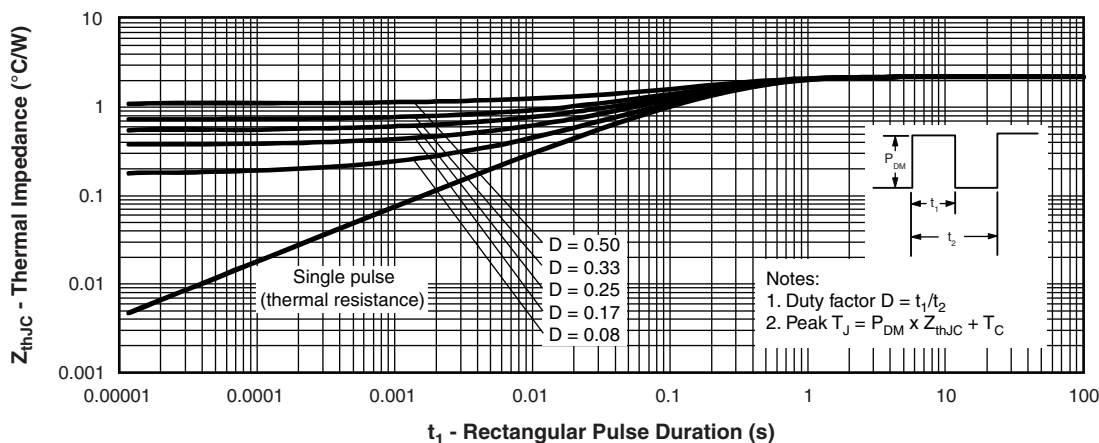


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

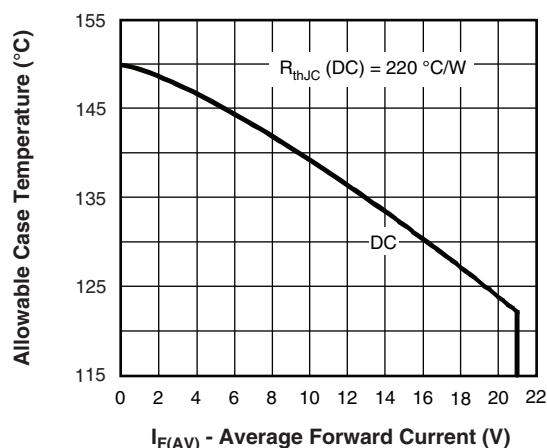


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

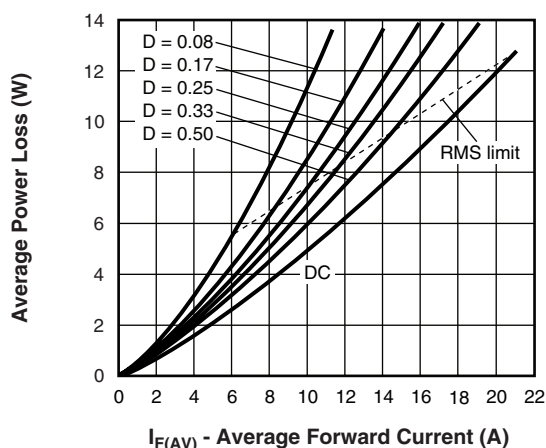


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

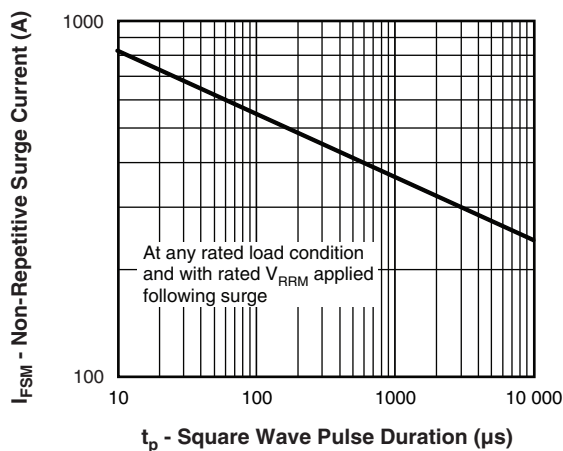


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

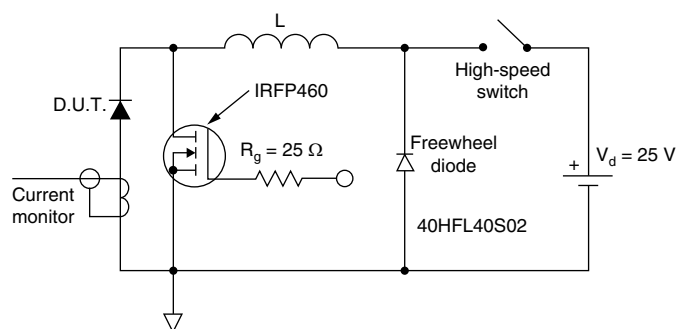


Fig. 8 - Unclamped Inductive Test Circuit



## ORDERING INFORMATION TABLE

Device code	<b>VS-</b>	<b>30</b>	<b>C</b>	<b>P</b>	<b>Q</b>	<b>060</b>	<b>-N3</b>
	①	②	③	④	⑤	⑥	⑦

<b>1</b>	-	Vishay Semiconductors product
<b>2</b>	-	Current rating (30 = 30 A)
<b>3</b>	-	Circuit configuration: C = common cathode
<b>4</b>	-	Package: P = TO-247
<b>5</b>	-	Schottky "Q" series
<b>6</b>	-	Voltage code
<b>7</b>	-	Environmental digit

050 = 50 V 060 = 60 V
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-N3 = halogen-free, RoHS-compliant, and totally lead (Pb)-free

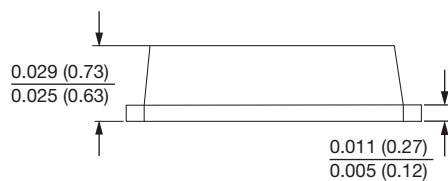
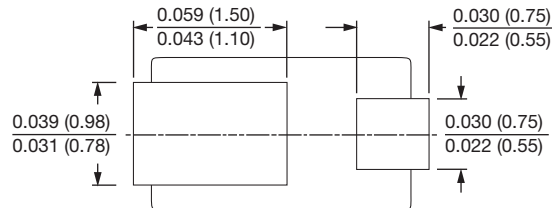
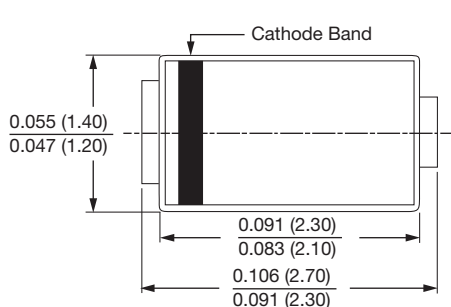
ORDERING INFORMATION (Example)			
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-30CPQ050-N3	25	500	Antistatic plastic tube
VS-30CPQ060-N3	25	500	Antistatic plastic tube

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?96138">www.vishay.com/doc?96138</a>
Part marking information	<a href="http://www.vishay.com/doc?95007">www.vishay.com/doc?95007</a>

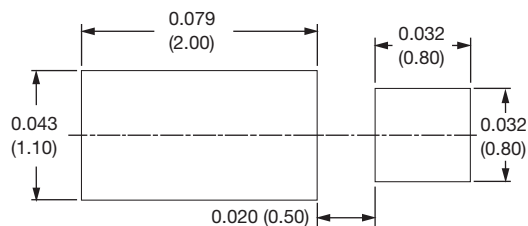


## MicroSMP (DO-219AD), FRED Pt®

**DIMENSIONS** in inches (millimeters)



**Mounting Pad Layout**





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