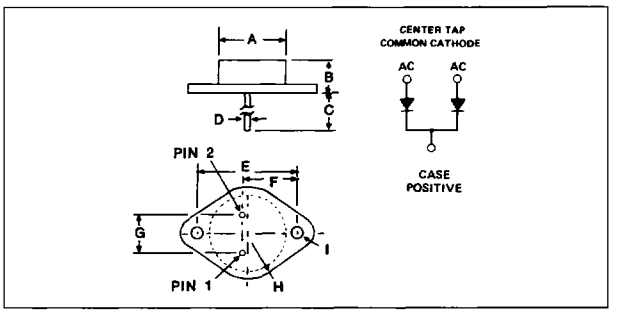
MICRO QUALITY SEMICONDUCTOR, INC.

30 Amp Center Tapped Schottky Rectifiers 150°C MAX T_J

20 Volt, 30 Volt and 40 Volt V_{RRM}
.640 Volt V_F at I_F = 15.0 Amps
Very Fast Switching Speed
Standard TO-3 Case

LTR.	INCHES	MILLIMETERS
A	.74–.76 Dia.	18,80–19,30
B	.323–.342	8,20–8,69
C	.40 Min.	10,16
D	.038–.043 Dia.	.97–1,09
E	1.180–1.194	29,97–30,33
F	.665–.675	16,89–17,15
G	.426–.440	10,82–11,18
H	.525R Max.	13,34
I	.151–.161 Dia.	3,84–4,09



MAXIMUM RATINGS, per diode (At T_A = 25°C unless otherwise noted)

RATINGS	SYMBOL	VSK3020T	VSK3030T	VSK3040T	UNITS
DC Blocking Voltage Working Peak Reverse Voltage Peak Repetitive Reverse Voltage	V_{RM} V_{RWM} V_{RRM}	20	30	40	Volts
RMS Reverse Voltage	$V_{R(RMS)}$	14	21	28	Volts
Average Rectified Forward Current (Fig. 5)**	I_O	30.0			Amps
Ambient Temp. @ Rated V_{RM}, $R_{\theta JA} \leq 4.5°C/W$* Individual Junction	T_A	95	90	85	°C
Peak Surge Current (non-rep), 300μs Pulse Width (Fig. 4)	I_{FSM}	500			Amps
Peak Surge Current (non-rep), ½ Cycle, 60Hz (Fig. 4)	I_{FSM}	300			Amps
Operating Junction Temperature	T_J	−65 to +150*			°C
Storage Temperature	T_{STG}	−65 to +150			°C
Thermal Resistance, Junction to Case**	$R_{\theta JC}$	1.5			°C/W

*At one-half rated V_{RRM}, $R_{\theta JA} \leq 4.5°C/W$ **Both junctions

ELECTRICAL CHARACTERISTICS, per diode (At T_A = 25°C unless otherwise noted)

CHARACTERISTICS	SYMBOL	VSK3020T	VSK3030T	VSK3040T	UNITS
Maximum Instantaneous Forward Voltage Drop See Fig. 2 for Typical V_F I_F = 8.0 Amps I_F = 15.0 Amps I_F = 45.0 Amps	V_F	.530 .640 1.04			Volts
Maximum Instantaneous Reverse Current at Rated V_{RM} See Fig. 1 for Typical I_R T_C = 25°C T_C = 100°C	I_R	10 75			mA

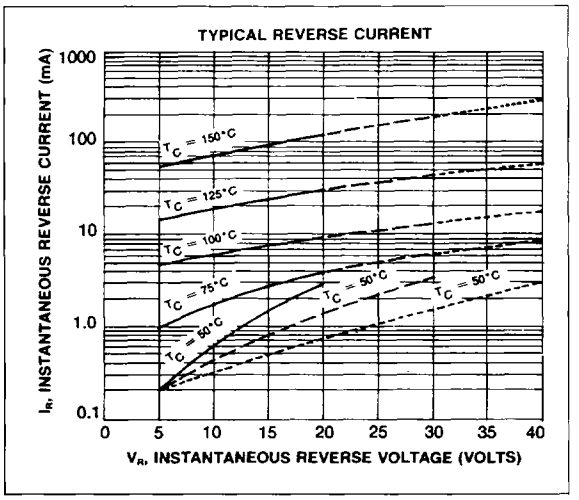


FIGURE 1

VSK3020T
VSK3030T
VSK3040T

PULSE WIDTH = 300μsec

T_C = CASE TEMP. MEASURED WITH SENSOR CENTERED ON BOTTOM OF CASE.

CURVES OF FIGURES 1,2,3 AND 4 ARE BASED ON INDIVIDUAL JUNCTIONS. CURVES OF FIGURE 5 ARE BASED ON TOTAL PACKAGE.

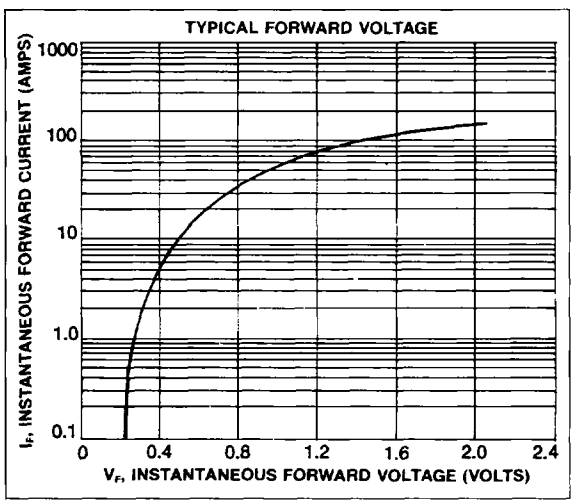


FIGURE 2

PULSE WIDTH = 300μsec

T_A = 25°C

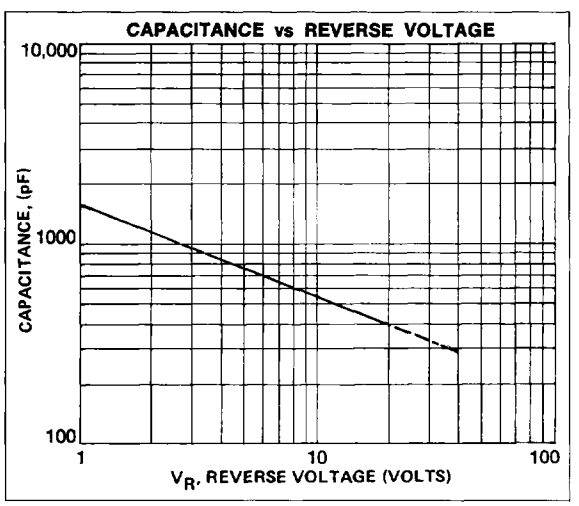


FIGURE 3

VSK3020T
VSK3030T
VSK3040T

T_A = 25°C

TEST FREQ = 100 kHz

The current flow in a Schottky barrier rectifier is due to majority carrier conduction and is not affected by reverse recovery transients due to stored charge and minority carrier injection as in conventional PN diodes.

The Schottky barrier rectifier may be considered for purposes of circuit analysis, as an ideal diode in parallel with a variable capacitance equal in value to the junction capacitance. See Figure 3.

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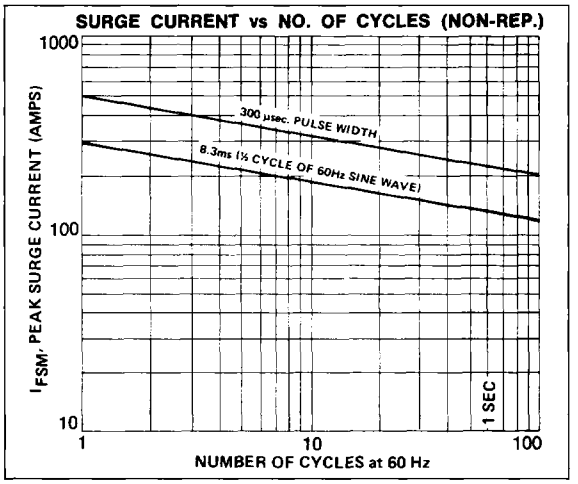

FIGURE 4

$T_A = 25°C$

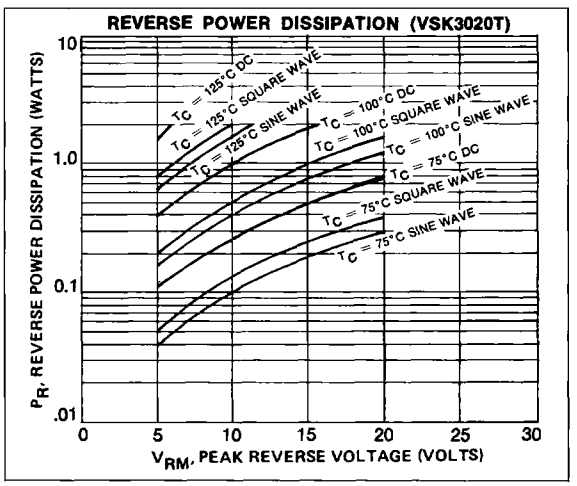

FIGURE 5(A)

REVERSE POWER MULTIPLIES 1.32x FOR EACH 5°C TEMP. INCREASE.

USE THIS MULTIPLIER FOR INTERPOLATION BETWEEN CURVES SHOWN ON FIGURES 5(A), 5(B), 5(C).

USE 75°C CURVES FOR ALL CASE TEMP. BELOW 75°C.

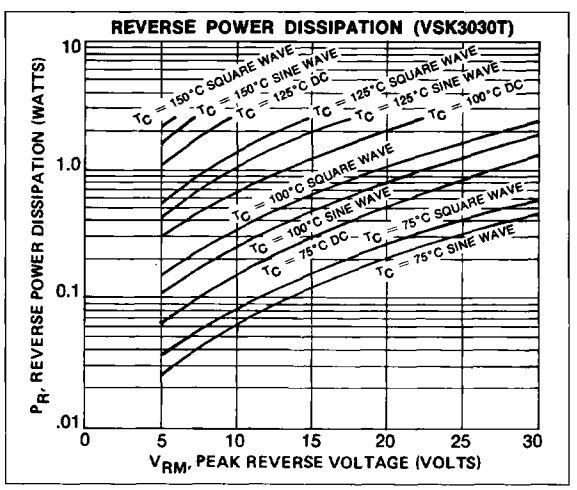

FIGURE 5(B)

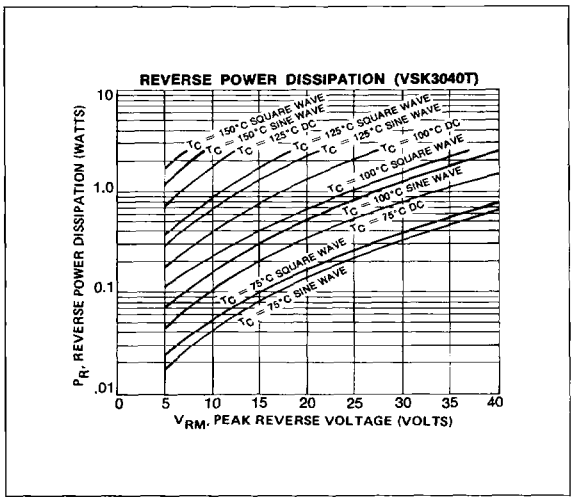

FIGURE 5(C)

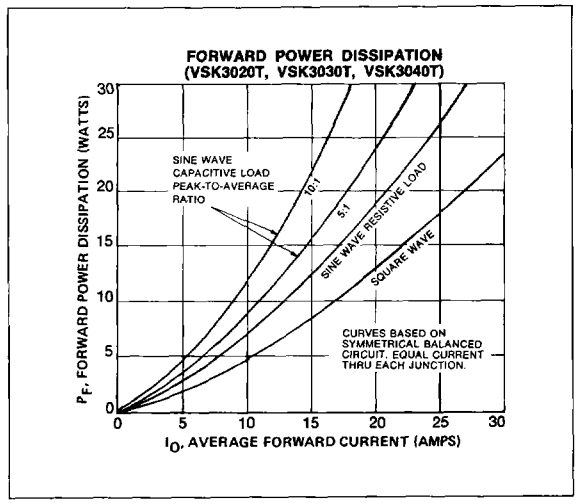

FIGURE 5(D)

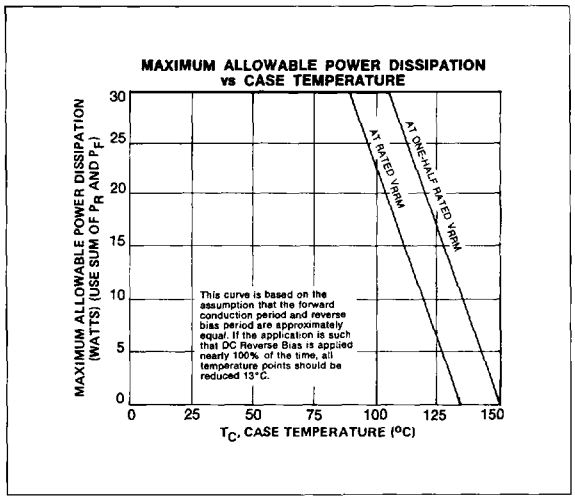

FIGURE 5(E)

Thermal Considerations:

1. Use the curves of Figure 5 to study the voltage/current/temperature parameters. To use the curves, add the reverse power dissipation from Figure 5 (A), (B) or (C) to the forward power dissipation from Figure 5 (D). Then go to Figure 5 (E) to find the maximum allowable case temperature.
2. Thermal runaway is entirely possible on marginal designs due to the inherently large reverse leakage of Schottky barrier rectifiers and the fact that reverse power multiplies about 1.32 times for each 5°C of junction temperature increase.
3. Slightly higher case temperatures can be tolerated when the reverse voltage is lower than that shown in Figure 5 (E).
4. We recommend that all designs be verified at an ambient temperature at least 10°C higher than the maximum at which the equipment will ever have to operate.