

MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

MUR405 MUR450
MUR410 MUR460
MUR415 MUR470
MUR420 MUR480
MUR430 MUR490
MUR440 MUR4100



SWITCHMODE POWER RECTIFIERS

... designed for use in switching power supplies, inverters and as free wheeling diodes, these state-of-the-art devices have the following features:

- Ultrafast 25, 50 and 75 Nanosecond Recovery Times
- 175°C Operating Junction Temperature
- Low Forward Voltage
- Low Leakage Current
- High Temperature Glass Passivated Junction
- Reverse Voltage to 1000 Volts

**ULTRAFAST
RECTIFIERS**

**4.0 AMPERES
50-1000 VOLTS**



**CASE 267-03
PLASTIC**

MAXIMUM RATINGS

Rating	Symbol	MUR												Unit
		405	410	415	420	430	440	450	460	470	480	490	4100	
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	50	100	150	200	300	400	500	600	700	800	900	1000	Volts
Average Rectified Forward Current (Square Wave) (Mounting Method #3 Per Note 1)	$I_F(AV)$	4.0 @ $T_A = 80^{\circ}C$			4.0 @ $T_A = 40^{\circ}C$				4.0 @ $T_A = 35^{\circ}C$				Amps	
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	I_{FSM}	125			70									Amps
Operating Junction Temperature and Storage Temperature	T_J, T_{stg}	- 65 to + 175												$^{\circ}C$

THERMAL CHARACTERISTICS

Maximum Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	See Note 1	$^\circ C/W$
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ELECTRICAL CHARACTERISTICS

Maximum Instantaneous Forward Voltage (1) ($I_F = 3.0$ Amp, $T_J = 150^\circ C$) ($I_F = 3.0$ Amp, $T_J = 25^\circ C$) ($I_F = 4.0$ Amp, $T_J = 25^\circ C$)	V_F	0.710 0.875 0.890	1.05 1.25 1.28	1.53 1.75 1.85	Volts
Maximum Instantaneous Reverse Current (1) (Rated dc Voltage, $T_J = 150^\circ C$) (Rated dc Voltage, $T_J = 25^\circ C$)	i_R	150 5.0	250 10	900 25	μA
Maximum Reverse Recovery Time ($I_F = 1.0$ Amp, $di/dt = 50$ Amp/ μs) ($I_F = 0.5$ Amp, $i_R = 1.0$ Amp, $I_{REC} = 0.25$ Amp)	t_{rr}	35 25	75 50	100 75	ns
Maximum Forward Recovery Time ($I_F = 1.0$ A, $di/dt = 100$ A/ μs , Recovery to 1.0 V)	t_{fr}	25	50	75	ns

(1) Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$

MUR405 Series

MUR405, 410 AND 415

FIGURE 1 — TYPICAL FORWARD VOLTAGE

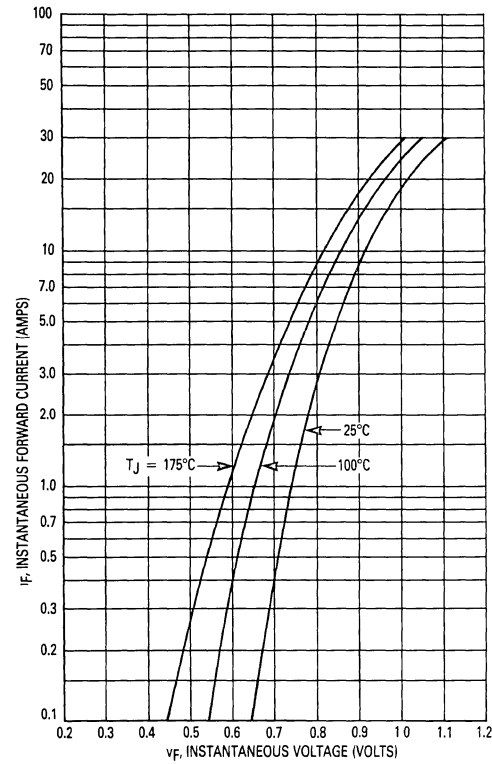


FIGURE 2 — TYPICAL REVERSE CURRENT*

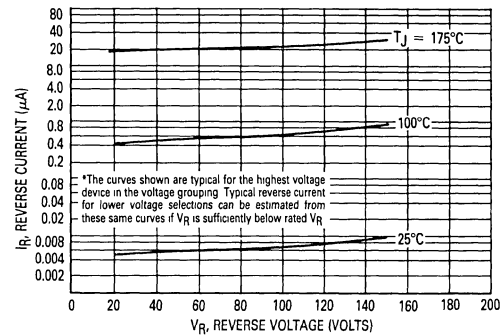


FIGURE 3 — CURRENT DERATING (MOUNTING METHOD #3 PER NOTE 1)

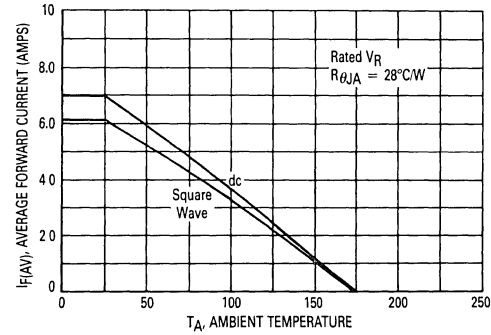


FIGURE 4 — POWER DISSIPATION

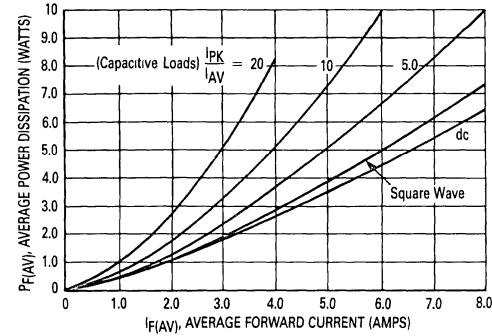
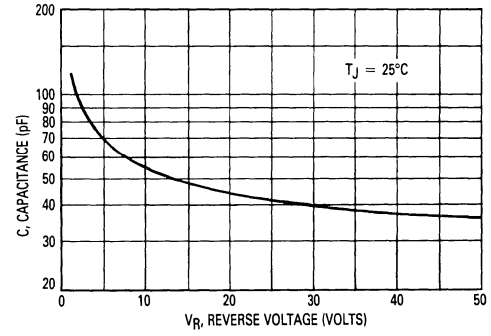


FIGURE 5 — TYPICAL CAPACITANCE



MUR405 Series

MUR420, 430, 440, 450 AND 460

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FIGURE 6 — TYPICAL FORWARD VOLTAGE

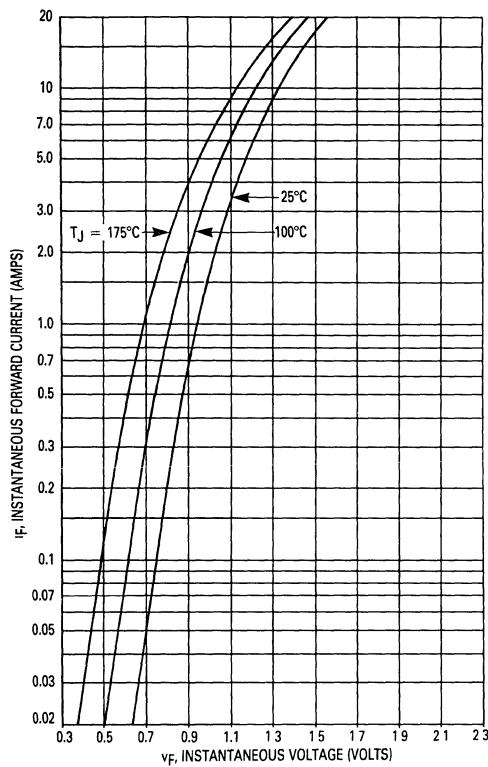


FIGURE 7 — TYPICAL REVERSE CURRENT*

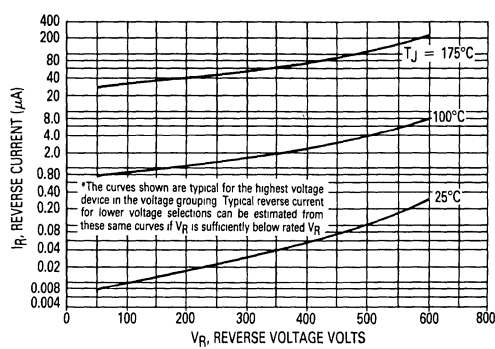


FIGURE 8 — CURRENT DERATING (MOUNTING METHOD #3 PER NOTE 1)

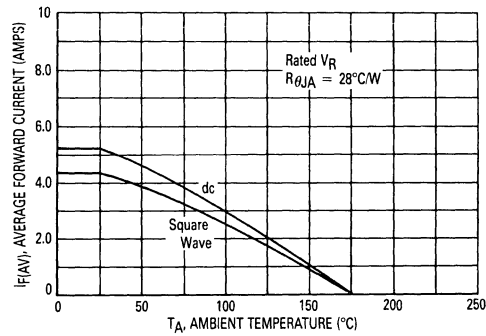


FIGURE 9 — POWER DISSIPATION

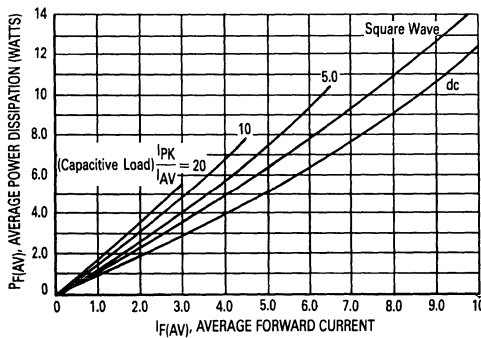
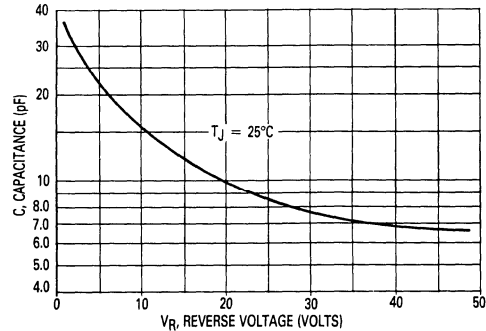


FIGURE 10 — TYPICAL CAPACITANCE



MUR405 Series

MUR470, 480, 490, 4100

FIGURE 11 — TYPICAL FORWARD VOLTAGE

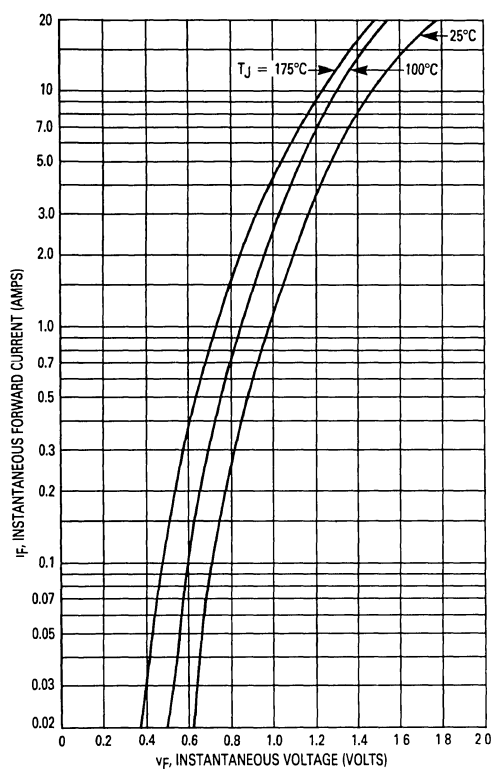


FIGURE 12 — TYPICAL REVERSE CURRENT*

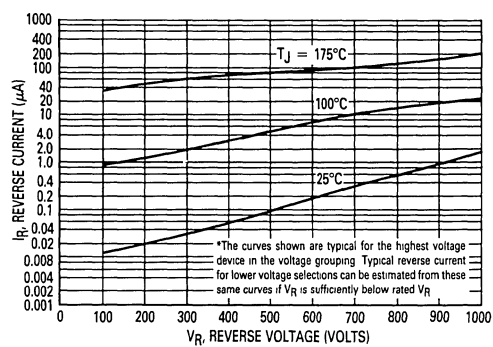


FIGURE 13 — CURRENT DERATING
(MOUNTING METHOD #3 PER NOTE 1)

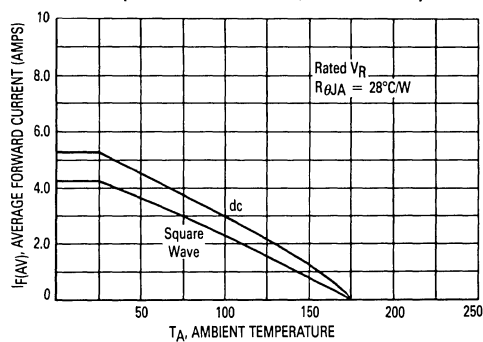


FIGURE 14 — POWER DISSIPATION

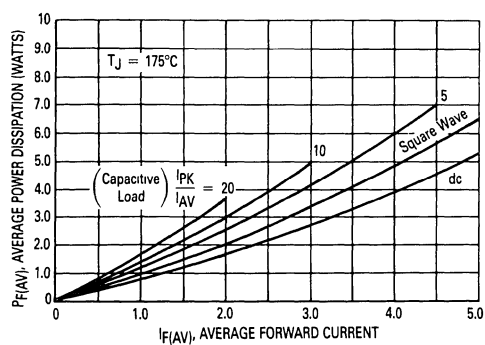
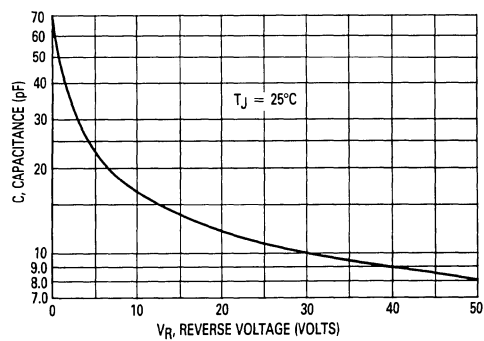


FIGURE 15 — TYPICAL CAPACITANCE



MUR405 Series

NOTE 1 — AMBIENT MOUNTING DATA

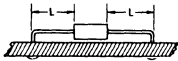
Data shown for thermal resistance junction-to-ambient ($R_{\theta JA}$) for the mountings shown is to be used as typical guideline values for preliminary engineering or in case the tie point temperature cannot be measured.

TYPICAL VALUES FOR $R_{\theta JA}$ IN STILL AIR

MOUNTING METHOD		LEAD LENGTH, L (IN)				UNITS
		1/8	1/4	1/2	3/4	
1	$R_{\theta JA}$	50	51	53	55	°C/W
2		58	59	61	63	°C/W
3		28				°C/W

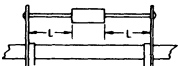
MOUNTING METHOD 1

P.C. Board Where Available Copper Surface area is small.



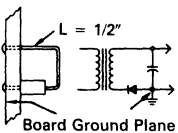
MOUNTING METHOD 2

Vector Push-In Terminals T-28



MOUNTING METHOD 3

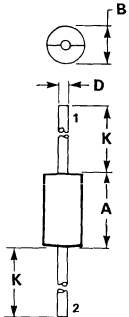
P.C. Board with 1-1/2" x 1-1/2" Copper Surface



MECHANICAL CHARACTERISTICS

Case: Transfer Molded Plastic
Finish: External Leads are Plated, Leads are readily Solderable
Polarity: Indicated by Cathode Band
Weight: 1.1 Grams (Approximately)
Maximum Lead Temperature for Soldering
Purposes:
300°C, 1/8" from case for 10 s

OUTLINE DIMENSIONS



STYLE 1
PIN 1 CATHODE
2 ANODE

NOTES.
1 DIMENSIONING & TOLERANCING PER ANSI Y14.5, 1982
2 CONTROLLING DIMENSION: INCH

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	9.40	9.65	0.370	0.380
B	4.83	5.33	0.190	0.210
D	1.22	1.32	0.048	0.052
K	25.40	—	1.000	—

CASE 267-03
PLASTIC