

MOTOROLA
SEMICONDUCTOR
 TECHNICAL DATA

MUR405 MUR430
MUR410 MUR440
MUR415 MUR450
MUR420 MUR460

MUR420, MUR440 and MUR460
 are Motorola Preferred Devices



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 600 Volts

**ULTRAFAST
 RECTIFIERS**

**4.0 AMPERES
 50-600 VOLTS**



**CASE 267-03
 PLASTIC**

3

MAXIMUM RATINGS

Rating	Symbol	MUR								Unit
		405	410	415	420	430	440	450	460	
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	Volts
Average Rectified Forward Current (Square Wave) (Mounting Method #3 Per Note 1)	$I_{F(AV)}$	4.0 @ $T_A = 80^\circ\text{C}$				4.0 @ $T_A = 40^\circ\text{C}$				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								$^\circ\text{C}$

THERMAL CHARACTERISTICS

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

ELECTRICAL CHARACTERISTICS

Maximum Instantaneous Forward Voltage (1) ($I_F = 3.0$ Amp, $T_J = 150^\circ\text{C}$) ($I_F = 3.0$ Amp, $T_J = 25^\circ\text{C}$) ($I_F = 4.0$ Amp, $T_J = 25^\circ\text{C}$)	V_F	0.710 0.875 0.890	1.05 1.25 1.28	Volts
Maximum Instantaneous Reverse Current (1) (Rated dc Voltage, $T_J = 150^\circ\text{C}$) (Rated dc Voltage, $T_J = 25^\circ\text{C}$)	I_R	150 5.0	250 10	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	ns
Maximum Forward Recovery Time ($I_F = 1.0$ A, $di/dt = 100$ A/ μs , Recovery to 1.0 V)	t_{fr}	25	50	ns

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

MUR405, 410 AND 415

FIGURE 1 — TYPICAL FORWARD VOLTAGE

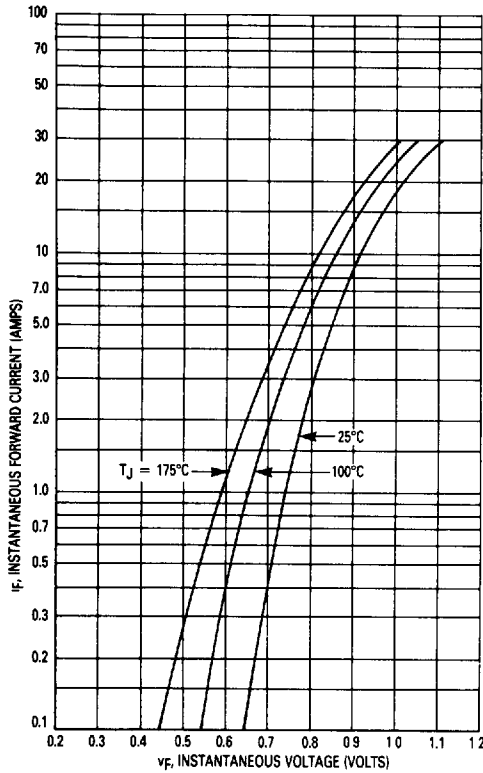


FIGURE 2 — TYPICAL REVERSE CURRENT*

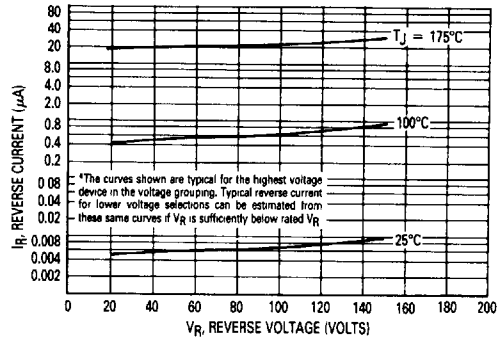


FIGURE 3 — CURRENT DERATING (MOUNTING METHOD #3 PER NOTE 1)

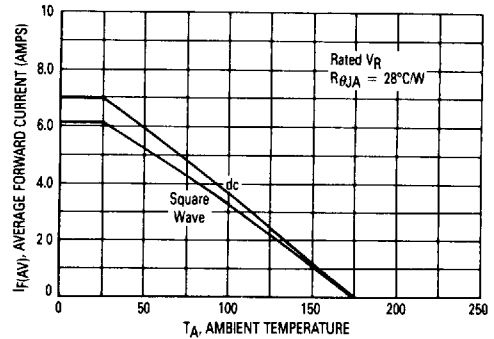


FIGURE 4 — POWER DISSIPATION

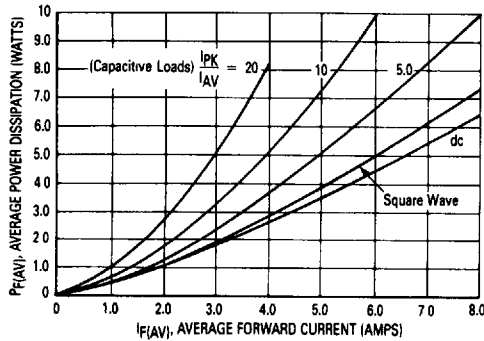
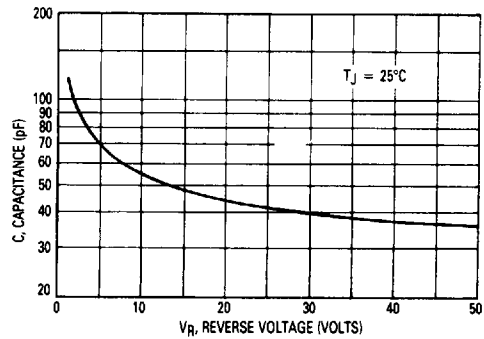


FIGURE 5 — TYPICAL CAPACITANCE



MUR405 Series

MUR420, 430, 440, 450 AND 460

FIGURE 6 — TYPICAL FORWARD VOLTAGE

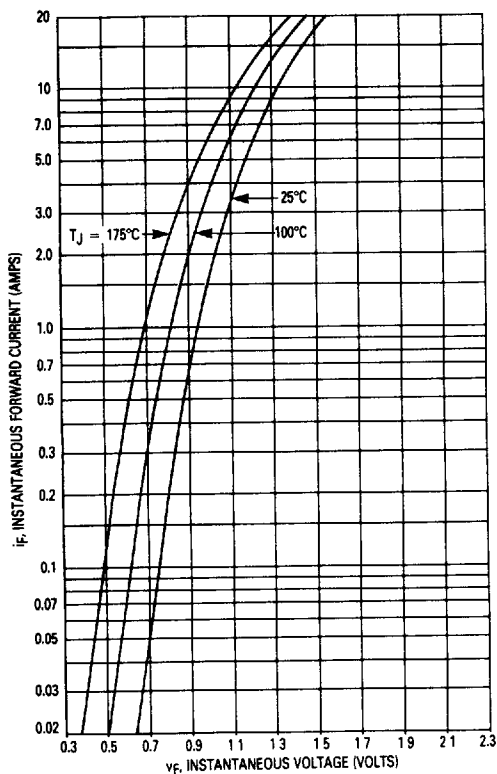


FIGURE 7 — TYPICAL REVERSE CURRENT*

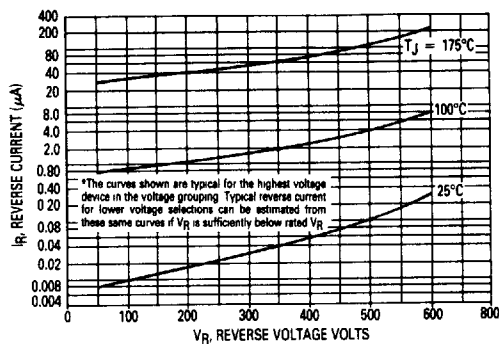


FIGURE 8 — CURRENT DERATING (MOUNTING METHOD #3 PER NOTE 1)

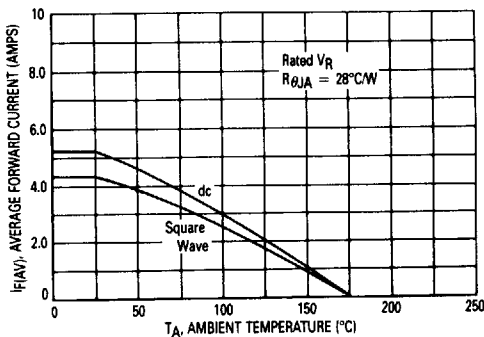


FIGURE 9 — POWER DISSIPATION

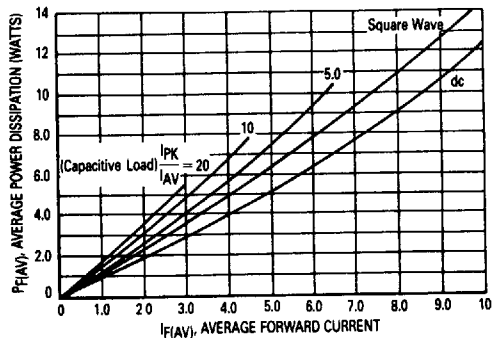
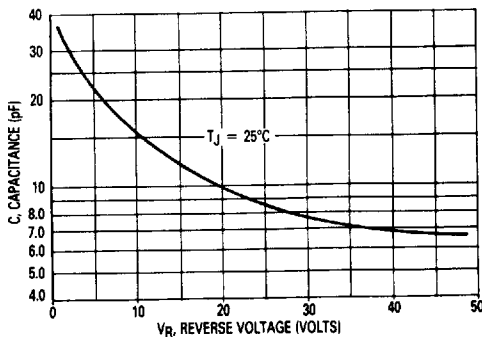


FIGURE 10 — TYPICAL CAPACITANCE



3

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 θ 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.



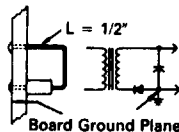
MOUNTING METHOD 2

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