



MOTOROLA
Semiconductors

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12173/1

MUR605CT
MUR610CT
MUR615CT
MUR620CT

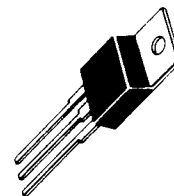
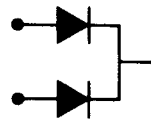
SWITCHMODE POWER RECTIFIERS

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

- Ultrafast 35 Nanosecond Recovery Time
- 175°C Operating Junction Temperature
- Popular TO-220 Package

**ULTRAFAST
RECTIFIERS**

**6 AMPERES
50-200 VOLTS**



**CASE 221A-02
TO-220AB**

MAXIMUM RATINGS

Rating	Symbol	MUR605CT	MUR610CT	MUR615CT	MUR620CT	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	50	100	150	200	Volts
Average Rectified Forward Current (Rated V_R) $T_C = 130^\circ\text{C}$	Per Diode Total Device $I_{F(AV)}$					Amps
Peak Repetitive Forward Current Per Diode Leg (Rated V_R , Square Wave, 20 kHz) $T_C = 130^\circ\text{C}$	I_{FRM}					Amps
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	I_{FSM}					Amps
Operating Junction Temperature and Storage Temperature	T_J, T_{stg}					$^\circ\text{C}$

THERMAL CHARACTERISTICS PER DIODE LEG

Rating	Symbol	Typical	Maximum	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	5.0-6.0	7.0	$^\circ\text{C/W}$

ELECTRICAL CHARACTERISTICS PER DIODE LEG

Instantaneous Forward Voltage (1) ($I_F = 3.0$ Amp, $T_C = 150^\circ\text{C}$) ($I_F = 3.0$ Amp, $T_C = 25^\circ\text{C}$)	V_F	0.80 0.94	0.895 0.975	Volts
Instantaneous Reverse Current (1) (Rated dc Voltage, $T_C = 150^\circ\text{C}$) (Rated dc Voltage, $T_C = 25^\circ\text{C}$)	I_R	2.0-10 0.01-3.0	250 5.0	μA
Reverse Recovery Time ($I_F = 1.0$ Amp, $di/dt = 50$ Amp/ μs)	t_{rr}	20-30	35	ns

(1) Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$.
Switchmode is a trademark of Motorola Inc.

FIGURE 1 — TYPICAL FORWARD VOLTAGE

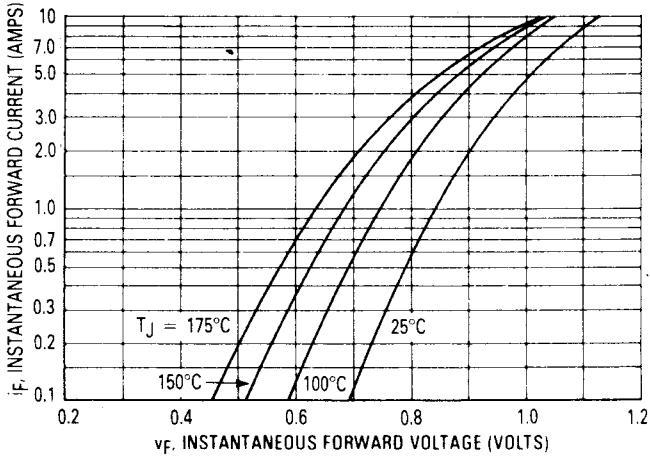


FIGURE 2 — TYPICAL REVERSE CURRENT

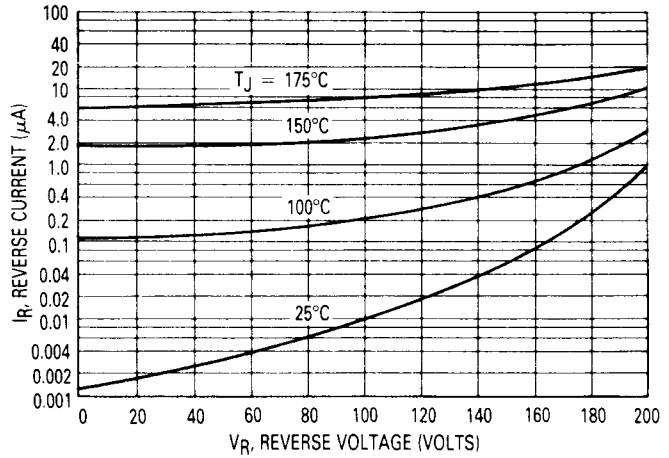


FIGURE 3 — TOTAL DEVICE CURRENT DERATING, CASE

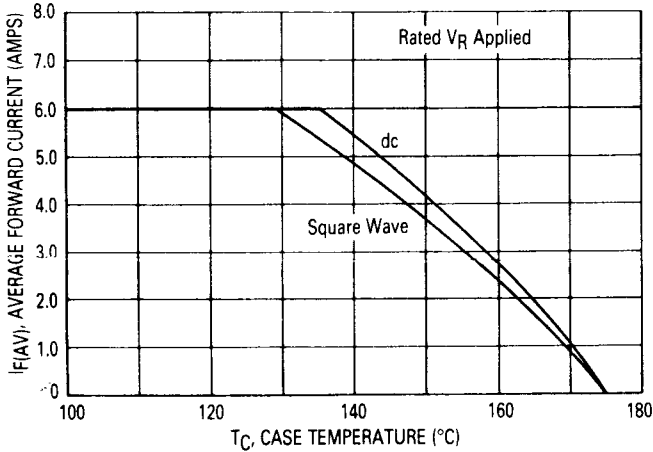


FIGURE 4 — TOTAL DEVICE CURRENT DERATING, AMBIENT

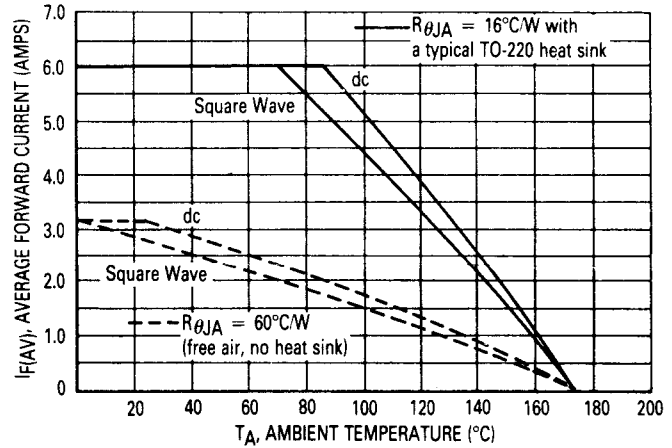
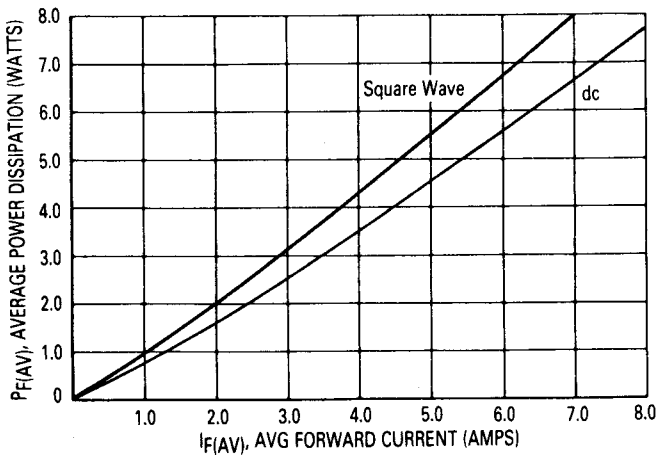


FIGURE 5 — POWER DISSIPATION



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	15.11	15.75	0.595	0.620
B	9.65	10.29	0.380	0.405
C	4.06	4.82	0.160	0.190
D	0.64	0.89	0.025	0.035
F	3.61	3.73	0.142	0.147
G	2.41	2.67	0.095	0.105
H	2.78	3.30	0.110	0.130
J	0.38	0.56	0.014	0.022
K	12.70	14.27	0.500	0.562
L	1.14	1.38	0.045	0.055
M	4.83	5.33	0.190	0.210
Q	2.54	3.04	0.100	0.120
R	2.04	2.78	0.080	0.110
S	1.14	1.38	0.045	0.055
T	5.97	6.48	0.235	0.255
U	0.76	1.27	0.030	0.050
V	1.14	-	0.045	-
Z	-	2.03	-	0.080

CASE 221A 02
(TO 220AB)

NOTES:
 1. DIMENSION H APPLIES TO ALL LEADS.
 2. DIMENSION L APPLIES TO LEADS 1 AND 3 ONLY.
 3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.
 4. DIMENSIONING AND TOLERANCING PER ANSI Y14.5 1913.
 5. CONTROLLING DIMENSION: INCH.

PIN 1: ANODE
 PIN 2: CATHODE
 PIN 3: ANODE
 PIN 4: CATHODE

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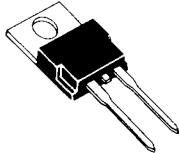




**GE Solid State
Bipolar Power Devices**

GE/RCA Products

MUR-810, MUR-815, MUR-820



JEDEC TO-220AC

**8-A, High-Speed, High Efficiency
Epitaxial Silicon Rectifiers**

Features:

- Ultra fast recovery time (<35 ns)
- Low forward voltage
- Low thermal resistance
- Planar design
- Wire-bonded construction

Applications:

- General Purpose
- Power switching circuits to 100 kHz
- Output rectification in switching power supplies

The RCA MUR-810, MUR-815, and MUR-820* are low forward voltage drop ultra fast-recovery rectifiers ($t_r < 35$ ns). They use a glass passivated ion-implanted epitaxial construction.

These devices are intended for use as output rectifiers and fly wheel diodes in a variety of high-frequency pulse-width modulated and switching regulators. Their low stored charge and attendant fast reverse-recovery behavior

minimize electrical noise generation and in many circuits markedly reduce the turn-on dissipation of the associated power switching transistors.

All are supplied in TO-220AC plastic packages.

* Formerly RCA RUR-810, RUR-815, and RUR-820, respectively.

MAXIMUM RATINGS, Absolute-Maximum Values:

	MUR-810	MUR-815	MUR-820	
VRM	100	150	200	V
IF (Average)				
$T_A = 25^\circ\text{C}$ (No Heat Sink)		3		A
$T_A = 25^\circ\text{C}$ (With Heat Sink) ^a		8		A
$T_C = 150^\circ\text{C}$		8		A
IFSM (surge)				
8.3ms, 1/2 cycle, non-repetitive		100		A
Tstg, T_J		-65 to 175		$^\circ\text{C}$
T_L (Lead temperature during soldering)				
At distance > 1/8in. (3.17mm) from case for 10 S max.		260		$^\circ\text{C}$

(a) Wakefield type 295 heat sink with convection cooling

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Marca(s) Registrada(s)

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File Number **1355**

ELECTRICAL CHARACTERISTICS

CHARACTERISTICS	TEST CONDITIONS			LIMITS						UNITS
	T _J °C	Voltage V _R V	Current i _F A	MUR-810		MUR-815		MUR-820		
				Min.	Max.	Min.	Max.	Min.	Max.	
i _R	25	100		—	5	—	—	—	—	μA
		150		—	—	—	5	—	—	
		200		—	—	—	—	—	10	
	150	100		—	250	—	—	—	—	
		150		—	—	—	250	—	—	
		200		—	—	—	—	—	500	
V _F	25		8	—	0.975	—	0.975	—	1.3	V
	150		8	—	0.895	—	0.895	—	1	
t _{rr}	25		1 (a)	—	35	—	35	—	60	ns
R _{θJC}				—	3	—	3	—	2	°C/W
R _{θJA}				—	60	—	60	—	60	
C _J	25	10	0	40 Typ.		40 Typ.		40 Typ.		pF

(a) di_F/dt > 40A/μs, I_{RM} (rec) < 1A, I_{RR} = 0.25A

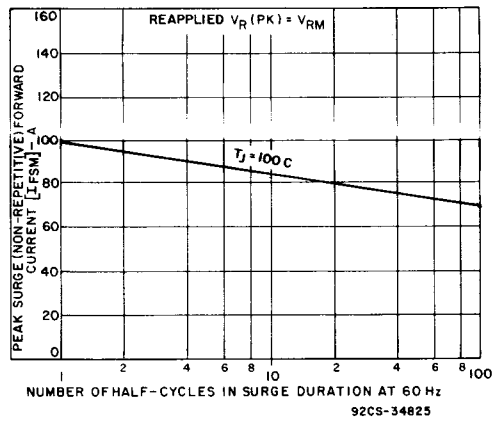


Fig. 1 - Peak surge forward current vs. surge duration.

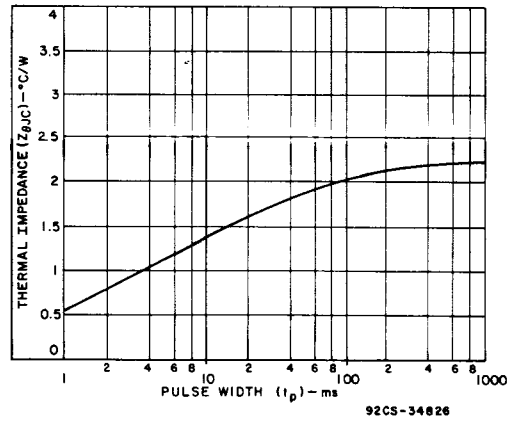


Fig. 2 - Thermal impedance vs. pulse width.

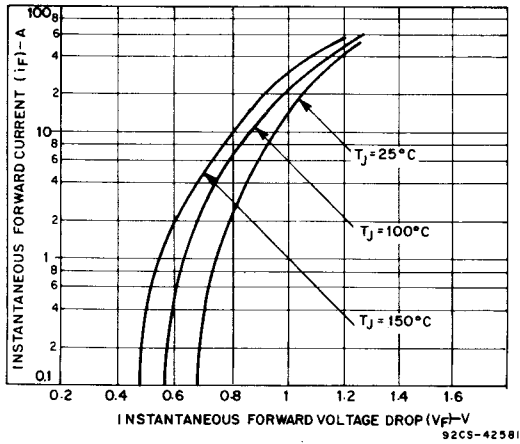


Fig. 3 - Typical forward current vs. forward-voltage drop.

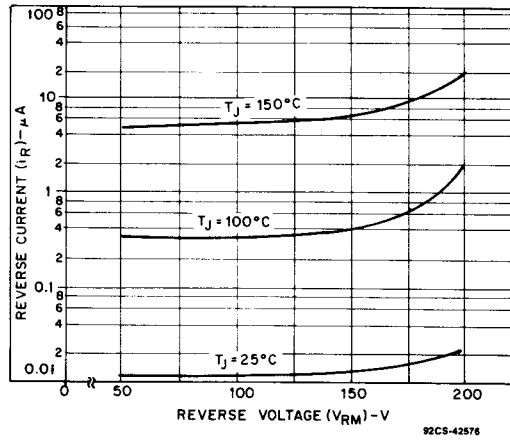
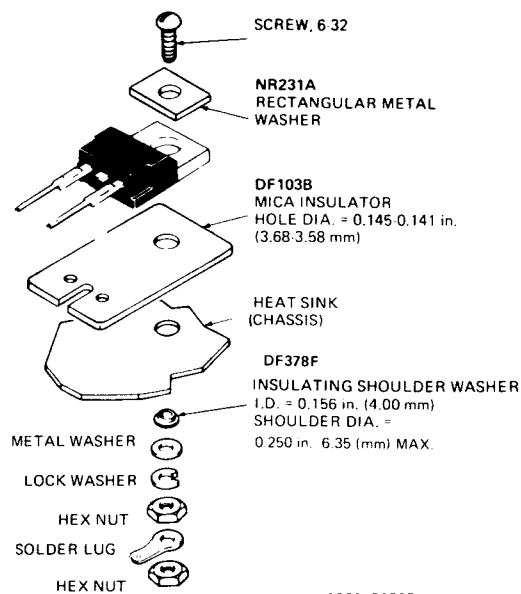


Fig. 4 - Typical reverse current vs. voltage.

SYMBOLS

di_F/dt	rate of change of forward current
i_F	instantaneous forward current
I_F	forward current
I_{FSM}	peak surge (non-repetitive) forward current
i_R	instantaneous reverse current
I_R	reverse current
$I_{RM} (rec)$	maximum peak reverse recovery current
I_{RR}	reverse recovery current
$R\theta_{JA}$	thermal resistance, junction-to-air
$R\theta_{JC}$	thermal resistance, junction-to-case
T_J	junction temperature
T_L	lead temperature
t_p	pulse duration
t_{rr}	reverse recovery time
T_{stg}	storage temperature
V_F	instantaneous forward voltage drop
V_{RM}	maximum (peak) reverse voltage
$Z\theta_{JC}$	thermal impedance, junction-to-case

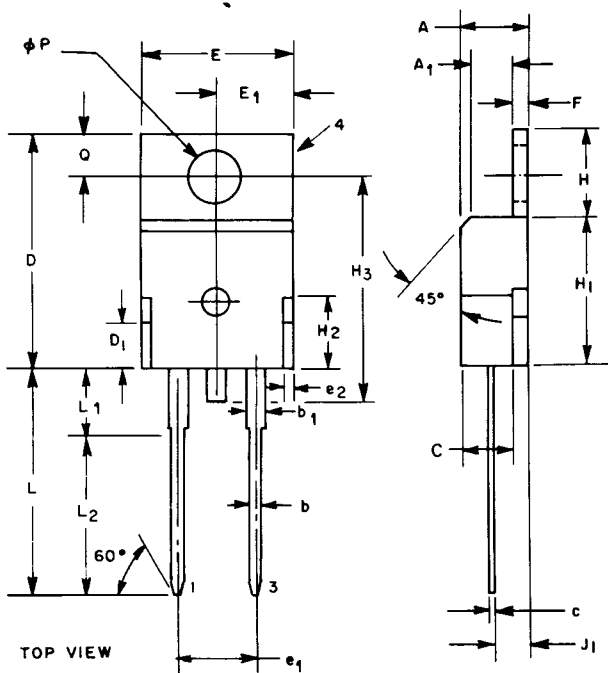


NOTE: MAXIMUM TORQUE APPLIED TO MOUNTING
FLANGE IS 8 in. lb. (0.09 kgf m)

Suggested mounting hardware for JEDEC TO-220AC.

DIMENSIONAL OUTLINE

JEDEC TO-220AC



SYMBOL	INCHES		MILLIMETERS	
	MIN.	MAX.	MIN.	MAX.
A	0.140	0.190	3.56	4.82
A ₁	0.080	0.085	2.03	2.16
b	0.020	0.045	0.51	1.14
b ₁	0.045	0.070	1.14	1.77
C	—	0.125	—	3.18
c	0.015	0.025	0.38	0.63
D	0.560	0.625	14.23	15.87
D ₁	—	0.100	—	2.54
E	0.380	0.420	9.66	10.66
e ₁	0.190	0.210	4.83	5.33
e ₂	—	0.030	—	0.76
F	0.045	0.055	1.14	1.39
H	0.230	0.270	5.85	6.85
H ₁	0.355	0.370	9.02	9.40
H ₂	—	0.160	—	4.06
H ₃	—	0.600	—	15.24
J ₁	0.080	0.115	2.04	2.92
L	0.500	0.562	12.70	14.27
L ₁	—	0.250	—	6.35
L ₂	0.400	0.410	10.16	10.41
phi P	0.139	0.161	3.531	4.089
Q	0.100	0.120	2.54	3.04

92CS-34830R1

NOTES:

- Position of lead to be measured 0.250-0.255 in. (6.350-6.477 mm) from case.

TERMINAL CONNECTIONS
JEDEC TO-220AC

Terminal No. 1 — Cathode
 Terminal No. 3 — Anode
 Terminal No. 4 — Cathode

GE Solid State

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