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Ultra-Fast-Recovery Rectifiers

RUR-D1610, RUR-D1615, RUR-D1620

File Number 1383

## Dual 16-A, High-Speed, High Efficiency Epitaxial Silicon Rectifiers

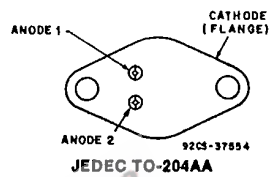
### Features:

- 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
- Full-wave rectification

### TERMINAL DESIGNATIONS



The RCA RUR-D1610, RUR-D1615 and RUR-D1620\* are low forward voltage drop, ultra fast-recovery rectifiers ( $t_{rr} < 35$  ns). They use an ion-implanted planar epitaxial construction.

These devices are intended for use as output rectifiers and fly wheel diodes in a variety of high-frequency pulse-width modulated power supplies, amplifiers 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 steel JEDEC TO-204AA hermetic packages.

\*Formerly RCA Developmental Nos. TA9226A, B and C respectively.

### MAXIMUM RATINGS, Absolute-Maximum Values, per Junction:

	RUR-D1610	RUR-D1615	RUR-D1620	
$V_{RM}$ .....	100	150	200	V
$I_F$ (Average)				
$T_A = 25^\circ C$ (No Heat Sink) .....		6		A
$T_A = 25^\circ C$ (With Heat Sink) ■ .....		16		A
$T_C = 125^\circ C$ .....		16		A
$I_{FSM}$ (surge)				
8.3 ms, 1/2 cycle, non-repetitive .....		275		A
Thermal Resistance (J-C) .....		1.5		$^\circ C/W$
Thermal Resistance (J-C) Total .....		1.2		$^\circ C/W$
Thermal Resistance (J-A) .....		30		$^\circ C/W$
$T_{stg}, T_J$ .....		-55 to 150		$^\circ C$
$T_L$ (Lead temperature during soldering)				
At distance $> 1/8$ in. (3.17 mm) from case for 10 s max. ....		260		$^\circ C$

■ Wakefield type 621 heat sink with convection cooling

RUR-D1610, RUR-D1615, RUR-D1620

ELECTRICAL CHARACTERISTICS, per junction

CHARACTERISTICS	TEST CONDITIONS			LIMITS						UNITS
	T <sub>J</sub> °C	Voltage V <sub>H</sub> V	Current I <sub>i</sub> A	RUR-D1610		RUR-D1615		RUR-D1620		
				Min.	Max.	Min.	Max.	Min.	Max.	
I <sub>r</sub>	25	100		—	15	—	—	—	—	μA
		150		—	—	—	15	—	—	
		200		—	—	—	—	—	15	
	100	100		—	1.5	—	—	—	—	mA
		150		—	—	—	1.5	—	—	
		200		—	—	—	—	1.5	—	
V <sub>F</sub>	25		16	—	0.95	—	0.95	—	1	V
125		16	—	0.83	—	0.83	—	0.88		
t <sub>rr</sub>	25		4(a)	—	35	—	35	—	35	ns
R <sub>θJC</sub> R <sub>θJA</sub>				—	1.5 30	—	1.5 30	—	1.5 30	°C/W
C <sub>J</sub>	25	10	0	80 Typ.		80 Typ.		80 Typ.		pF

(a) diF/dt > 40A/μs, I<sub>RM</sub>(rec) < 1A, I<sub>RR</sub> = 0.25A

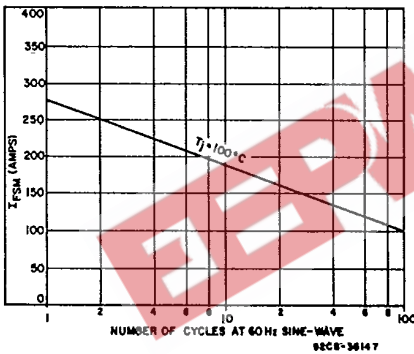


Fig. 1 - Peak surge forward current vs. surge duration.

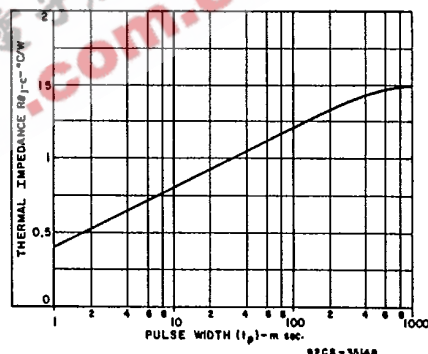


Fig. 2 - Thermal impedance vs. pulse width (per junction).

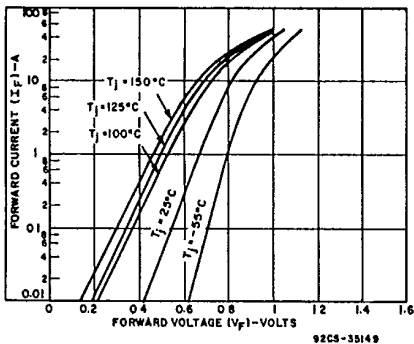


Fig. 3 - Typical forward current vs. forward-voltage drop.

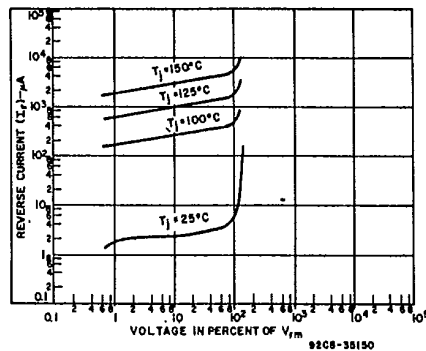


Fig. 4 - Typical reverse current vs. voltage.