BYW51-100, BYW51-150, BYW51-200

File Number **1412**

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

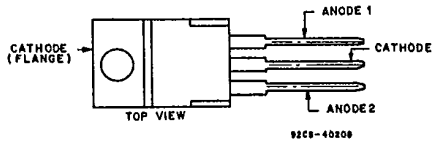
Features:

- *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*
- *Full-wave rectification*

TERMINAL DESIGNATIONS



JEDEC TO-220AB

The BYW51 series devices are low forward voltage drop, ultra-fast-recovery rectifiers (trr < 35 ns). They use a planar 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-220AB plastic packages.

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

	BYW 51-100	BYW 51-150	BYW 51-200	
V_{RRM}	100	150	200	V
V_{RSM}	110	165	220	V
I_{FRM}, $t_p < 10\ \mu s$	100	100	100	A
$I_{F(RMS)}$, total	20	20	20	A
$I_{F(Average)}$, total T_C = 125°C, δ = 0.5	20	20	20	A
I_{FSM}(Surge) t_p = 10 ms, sinusoidal	100	100	100	A
P_D, T_C = 125°C	20	20	20	W
T_j	-40 + 150	-40 + 150	-40 + 150	°C
T_L (Lead temperature during soldering) At distance > 1/8 in. (3.17 mm) from case for 10 S max.	260	260	260	°C

BYW51-100, BYW51-150, BYW51-200

ELECTRICAL CHARACTERISTICS, per junction

CHARACTERISTICS	TEST CONDITIONS			LIMITS						UNITS
				BYW51-100		BYW51-150		BYW51-200		
	T_J °C	Voltage V_R V	Current I_F A	Min.	Max.	Min.	Max.	Min.	Max.	
i_R	25	100		—	5	—	—	—	—	μA
		150		—	—	—	5	—	—	
		200		—	—	—	—	—	5	
	100	100		—	1	—	—	—	—	mA
		150		—	—	—	1	—	—	
		200		—	—	—	—	—	1	
V_F	25		8	—	0.95	—	0.95	—	0.95	V
	100		8	—	0.89	—	0.89	—	0.89	
t_{rr}	25		1(a)	—	35	—	35	—	35	ns
$R_{\theta JC}$, per leg				—	2.5		2.5	—	2.5	°C/W
$R_{\theta JC}$, total				—	1.3	—	1.3	—	1.3	
$R_{\theta JA}$				—	60	—	60	—	60	
C_J	25	10	0	All types (typ.) 40						pF

(a) $di_F/dt > 50A/\mu s$, $I_{RM(rec)} < 1A$, $I_{RR} = 0.25A$

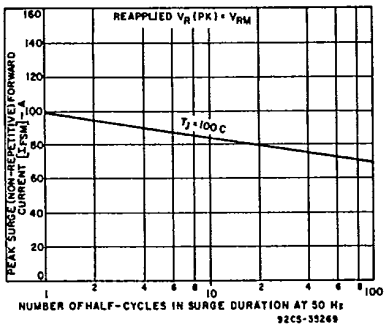


Fig. 1 - Peak surge forward current vs. surge duration.

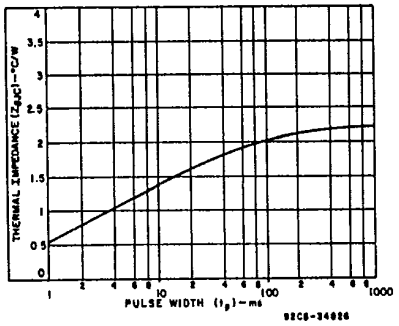


Fig. 2 - Thermal impedance vs. pulse width (per junction).

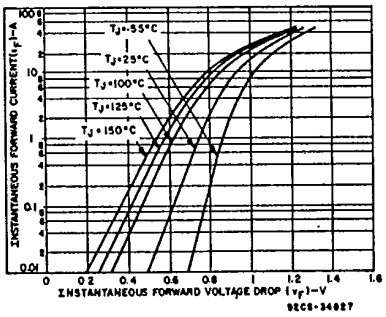


Fig. 3 - Typical forward current vs. forward-voltage drop.

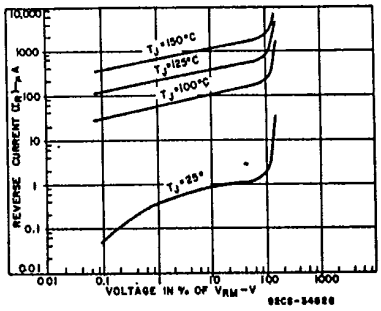


Fig. 4 - Typical reverse current vs. voltage.

RUR-810, RUR-815, RUR-820

File Number **1355**

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

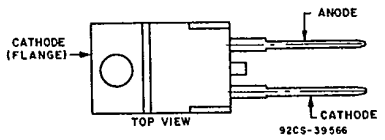
Features:

- *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*

TERMINAL DESIGNATIONS



JEDEC TO-220AC

The RCA RUR-810, RUR-815, and RUR-820* are low forward voltage drop ultra fast-recovery rectifiers (trr <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 Dev. No. TA9223A, TA9223B, and TA9223C, respectively.

MAXIMUM RATINGS, *Absolute-Maximum Values:*

	RUR-810	RUR-815	RUR-820	
VRM	100	150	200	V
IF (Average)				
T_A = 25°C (No Heat Sink)		3		A
T_A = 25°C (With Heat Sink)[a]		8		A
T_C = 125°C		8		A
IFSM (surge)				
8.3ms, 1/2 cycle, non-repetitive		100		A
Tstg, T_J		-55 to 150		°C
T_L (Lead temperature during soldering)				
At distance > 1/8in. (3.17mm) from case for 10 S max.		260		°C

(a) Wakefield type 295 heat sink with convection cooling

RUR-810, RUR-815, RUR-820

ELECTRICAL CHARACTERISTICS

CHARACTERISTICS	TEST CONDITIONS			LIMITS						UNITS
				RUR-810		RUR-815		RUR-820		
	T_J °C	Voltage V_R V	Current I_F A	Min.	Max.	Min.	Max.	Min.	Max.	
I_R	25	100		—	5	—	—	—	—	μA
		150		—	—	—	5	—	—	
		200		—	—	—	—	—	5	
	100	100		—	400	—	—	—	—	
		150		—	—	—	400	—	—	
		200		—	—	—	—	—	400	
V_F	25		8	—	0.95	—	0.95	—	1	V
	100		8	—	0.89	—	0.89	—	0.94	
t_{rr}	25		2(a)	—	35	—	35	—	35	ns
$R_{\theta JC}$				—	2.25	—	2.25	—	2.25	°C/W
$R_{\theta JA}$				—	60	—	60	—	60	
C_J	25	10	0	40 Typ.		40 Typ.		40 Typ.		pF

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

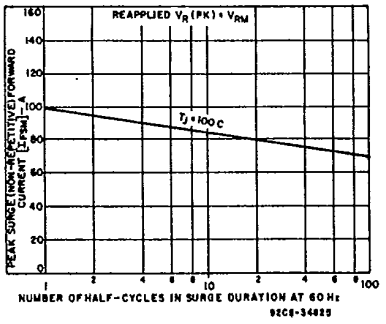


Fig. 1 — Peak surge forward current vs. surge duration.

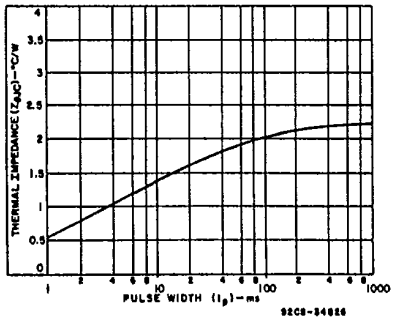


Fig. 2 — Thermal impedance vs. pulse width.

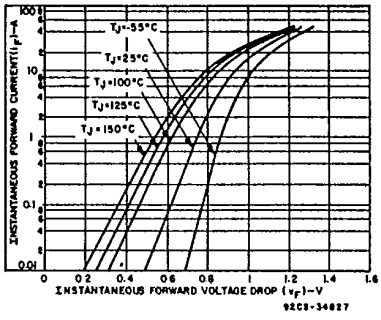


Fig. 3 — Typical forward current vs. forward-voltage drop.

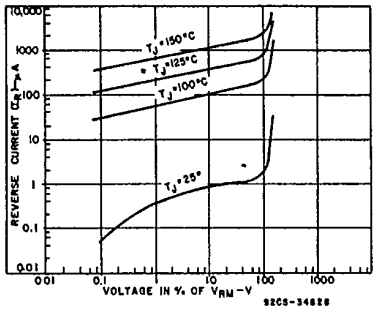


Fig. 4 — Typical reverse current vs. voltage.

RUR-D810, RUR-D815, RUR-D820

File Number **1356**

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

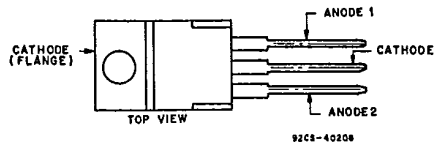
Features:

- *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*
- *Full-wave rectification*

TERMINAL DESIGNATIONS



JEDEC TO-220AB

The RCA RUR-D810, RUR-D815, and RUR-D820* are low forward voltage drop ultra fast-recovery rectifiers (trr <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-220AB plastic packages.

*Formerly RCA Dev. No. TA9224A, TA9224B, and TA9224C, respectively.

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

	RUR-D810	RUR-D815	RUR-D820	
VRM	100	150	200	V
IF (Average)				
T_A = 25°C (No Heat Sink)		3		A
T_A = 25°C (With Heat Sink)[a]		8		A
T_C = 125°C		8		A
IFSM (surge)				
8.3ms, 1/2 cycle, non-repetitive		100		A
Tstg, T_J		-55 to 150		°C
T_L (Lead temperature during soldering)				
At distance > 1/8in. (3.17mm) from case for 10 S max.		260		°C

(a) Wakefield type 295 heat sink with convection cooling

RUR-D810, RUR-D815, RUR-D820

ELECTRICAL CHARACTERISTICS, per junction

CHARACTERISTICS	TEST CONDITIONS			LIMITS						UNITS
				RUR-D810		RUR-D815		RUR-D820		
	T_J °C	Voltage V_R V	Current I_F A	Min.	Max.	Min.	Max.	Min.	Max.	
i_R	25	100		—	5	—	—	—	—	μA
		150		—	—	—	5	—	—	
		200		—	—	—	—	—	5	
	100	100		—	400	—	—	—	—	
		150		—	—	—	400	—	—	
		200		—	—	—	—	—	400	
V_F	25		8	—	0.95	—	0.95	—	1	V
	100		8	—	0.89	—	0.89	—	0.94	
t_{rr}	25		8(a)	—	35	—	35	—	35	ns
$R\theta_{JC}$				—	2.25	—	2.25	—	2.25	°C/W
$R\theta_{JA}$				—	60	—	60	—	60	
C_J	25	10	0	40 Typ.		40 Typ.		40 Typ.		pF

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

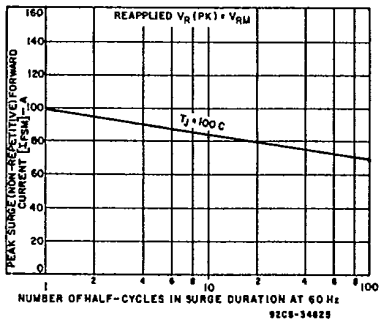


Fig. 1 — Peak surge foward current vs. surge duration.

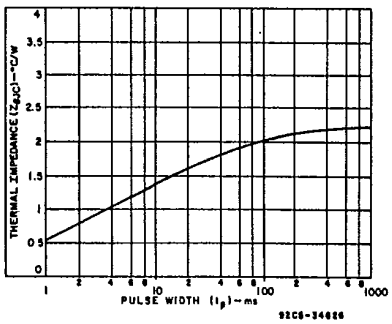


Fig. 2 - Thermal impedance vs. pulse width (per junction).

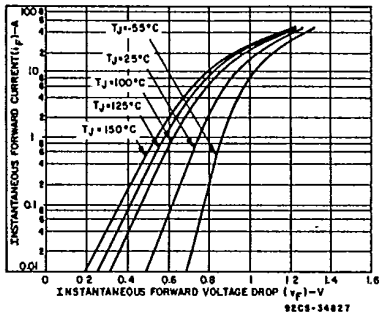


Fig. 3 — Typical forward current vs. forward-voltage drop.

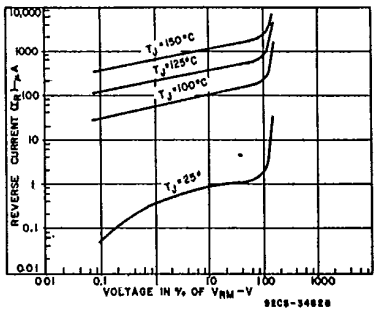


Fig. 4 — Typical reverse current vs. voltage.