

MUR1540, MUR1560, RURP1540, RURP1560

Data Sheet January 2002

15A, 400V - 600V Ultrafast Diodes

The MUR1540, MUR1560, RURP1540, and RURP1560 are ultrafast diodes ($t_{rr} < 55$ ns) with soft recovery characteristics. They have a low forward voltage drop and are of planar, silicon nitride passivated, ion-implanted, epitaxial construction.

These devices are intended for use as energy steering/clamping diodes and rectifiers in a variety of switching power supplies and other power switching applications. Their low stored charge and ultrafast recovery with soft recovery characteristics minimizes ringing and electrical noise in many power switching circuits, thus reducing power loss in the switching transistor.

Formerly developmental type TA09905.

Ordering Information

PART NUMBER	PACKAGE	BRAND		
MUR1540	TO-220AC	MUR1540		
RURP1540	TO-220AC	RURP1540		
MUR1560	TO-220AC	MUR1560		
RURP1560	TO-220AC	RURP1560		

NOTE: When ordering, use the entire part number

Symbol



Absolute Maximum Ratings $T_C = 25^{\circ}C$, Unless Otherwise Specified

Features

•	Ultrafast with Soft Recovery <55ns
•	Operating Temperature175°C
•	Reverse Voltage Up to

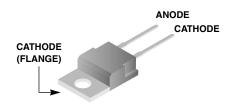
- · Avalanche Energy Rated
- Planar Construction

Applications

- · Switching Power Supply
- · Power Switching Circuits
- · General Purpose

Packaging

JEDEC TO-220AC



MUDIE

100

20

-55 to 175

	MUR1540 RURP1540	MUR1560 RURP1560	UNITS
Peak Repetitive Reverse Voltage	400	600	V
Working Peak Reverse Voltage	400	600	V
DC Blocking VoltageV _R	400	600	V
Average Rectified Forward Current $I_{F(AV)}$ ($T_C = 145^{\circ}C$)	15	15	Α
Repetitive Peak Surge Current	30	30	Α
Nonrepetitive Peak Surge Current	200	200	Α

(Halfwave 1 Phase 60Hz)

100

20

-55 to 175

W

mJ °C

MUDIES

MUR1540, MUR1560, RURP1540, RURP1560

Electrical Specifications $T_C = 25^{\circ}C$, Unless Otherwise Specified

		MUR1540, RURP1540		1540	MUR1560, RURP1560			
SYMBOL	TEST CONDITION	MIN	TYP	MAX	MIN	TYP	MAX	UNITS
V _F	I _F = 15A	-	-	1.25	-	-	1.5	V
	I _F = 15A, T _C = 150°C	-	-	1.12	-	-	1.2	V
I _R	V _R = 400V	-	-	100	-	-	-	μА
	V _R = 600V	-	-	-	-	-	100	μА
	$V_R = 400V, T_C = 150^{\circ}C$	-	-	500	-	-	-	μА
	V _R = 600V, T _C = 150°C	-	-	-	-	-	500	μА
t _{rr}	$I_F = 1A$, $dI_F/dt = 100A/\mu s$	-	-	55	-	-	55	ns
	I _F = 15A, dI _F /dt = 100A/μs	-	-	60	-	-	60	ns
t _a	I _F = 15A, dI _F /dt = 100A/μs	-	30	-	-	30	-	ns
t _b	$I_F = 15A$, $dI_F/dt = 100A/\mu s$	-	17	-	-	20	-	ns
$R_{ heta JC}$		-	-	1.5	-	-	1.5	°C/W

DEFINITIONS

 V_F = Instantaneous forward voltage (pw = 300 μ s, D = 2%).

I_R = Instantaneous reverse current.

 t_{rr} = Reverse recovery time at dI_F/dt = 100A/ μs (See Figure 6), summation of t_a + t_b .

 t_a = Time to reach peak reverse current at dI_F/dt = 100A/ μ s (See Figure 6).

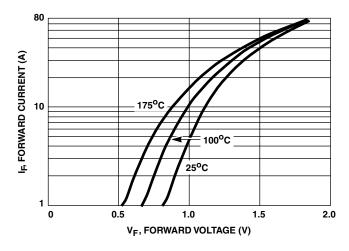
 t_b = Time from peak I_{RM} to projected zero crossing of I_{RM} based on a straight line from peak I_{RM} through 25% of I_{RM} (See Figure 6).

 $R_{\theta JC}$ = Thermal resistance junction to case.

pw = pulse width.

D = duty cycle.

Typical Performance Curves





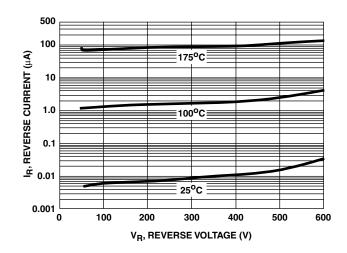


FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE

Typical Performance Curves (Continued)

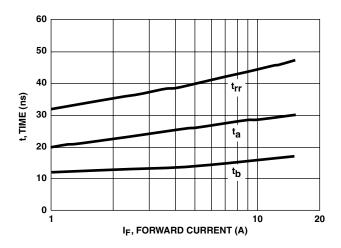


FIGURE 3. t_{rr}, t_a AND t_b CURVES vs FORWARD CURRENT

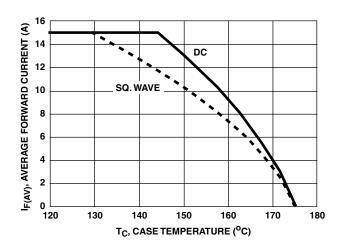


FIGURE 4. CURRENT DERATING CURVE

Test Circuits and Waveforms

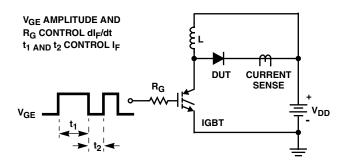


FIGURE 5. t_{rr} TEST CIRCUIT

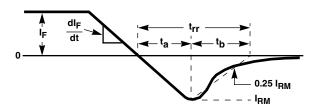


FIGURE 6. t_{rr} WAVEFORMS AND DEFINITIONS

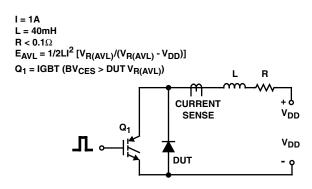


FIGURE 7. AVALANCHE ENERGY TEST CIRCUIT

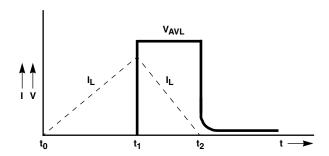


FIGURE 8. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

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