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RURP1560

15A, 400V - 600V Ultrafast Diode

The RURP1560 is an ultrafast diode ($t_{rr} < 55ns$) with soft recovery characteristics. It has a low forward voltage drop and is of planar, silicon nitride passivated, ion-implanted, epitaxial construction.

This device is intended for use as an energy steering/clamping diode and rectifier in a variety of switching power supplies and other power switching applications. Its 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
RURP1560	TO-220AC	RURP1560

NOTE: When ordering, use the entire part number

Symbol

Features

- Ultrafast with Soft Recovery . . . . <55ns
- Operating Temperature . . . . .175°C
- Reverse Voltage Up to 600V
- Avalanche Energy Rated
- Planar Construction

Applications

- Switching Power Supply
- Power Switching Circuits
- General Purpose

Packaging

JEDEC TO-220AC
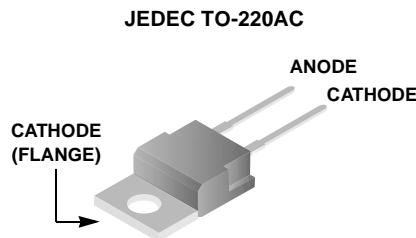
Absolute Maximum Ratings $T_C = 25^{o}$C, Unless Otherwise Specified

		RURP1560	UNITS
Peak Repetitive Reverse Voltage	V_{RRM}	600	V
Working Peak Reverse Voltage	V_{RWM}	600	V
DC Blocking Voltage	V_R	600	V
Average Rectified Forward Current. . . . . ($T_C = 145^{o}$C)	$I_{F(AV)}$	15	A
Repetitive Peak Surge Current . . . . (Square Wave 20kHz)	I_{FRM}	30	A
Nonrepetitive Peak Surge Current . . . . (Halfwave 1 Phase 60Hz)	I_{FSM}	200	A
Maximum Power Dissipation.	P_D	100	W
Avalanche Energy (See Figures 7 and 8)	E_{AVL}	20	mJ
Operating and Storage Temperature	T_{STG}, T_J	-55 to 175	^{o}C

Electrical Specifications $T_C = 25^oC$, Unless Otherwise Specified

SYMBOL	TEST CONDITION	RURP1560			UNITS
		MIN	TYP	MAX	
V_F	$I_F = 15A$	-	-	1.5	V
	$I_F = 15A, T_C = 150^oC$	-	-	1.2	V
I_R	$V_R = 600V$	-	-	100	μA
	$V_R = 600V, T_C = 150^oC$	-	-	500	μA
t_{rr}	$I_F = 1A, dI_F/dt = 100A/\mu s$	-	-	55	ns
	$I_F = 15A, dI_F/dt = 100A/\mu s$	-	-	60	ns
t_a	$I_F = 15A, dI_F/dt = 100A/\mu s$	-	30	-	ns
t_b	$I_F = 15A, dI_F/dt = 100A/\mu s$	-	20	-	ns
$R_{\theta JC}$		-	-	1.5	$^oC/W$

DEFINITIONS

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

I_R = Instantaneous reverse current.

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

t_a = Time to reach peak reverse current at $dI_F/dt = 100A/\mu s$ (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.
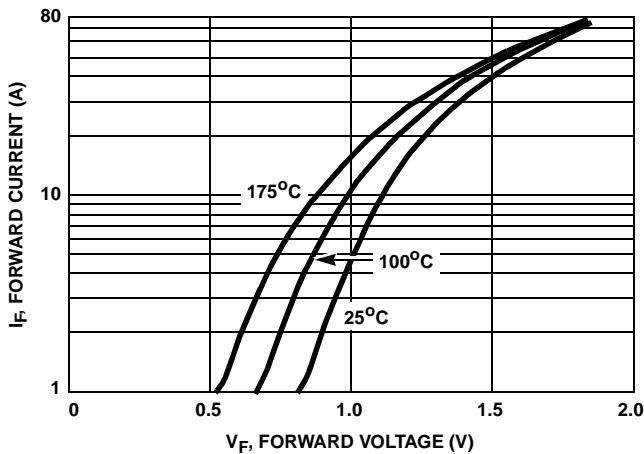
Typical Performance Curves
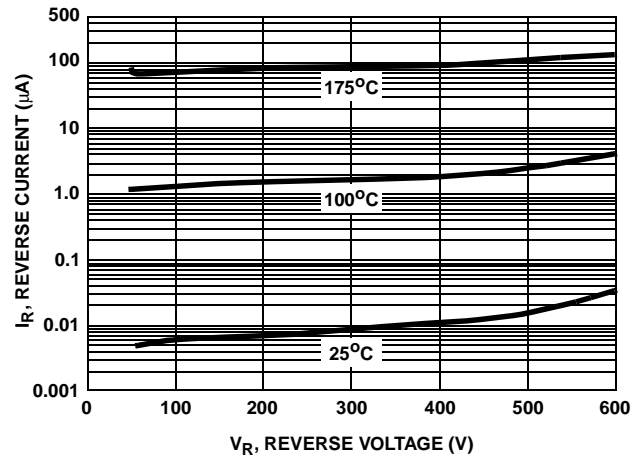

FIGURE 1. FORWARD CURRENT vs FORWARD VOLTAGE

FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE
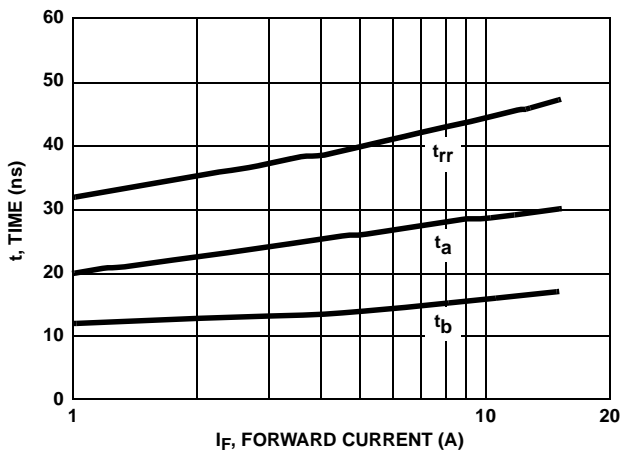
Typical Performance Curves (Continued)

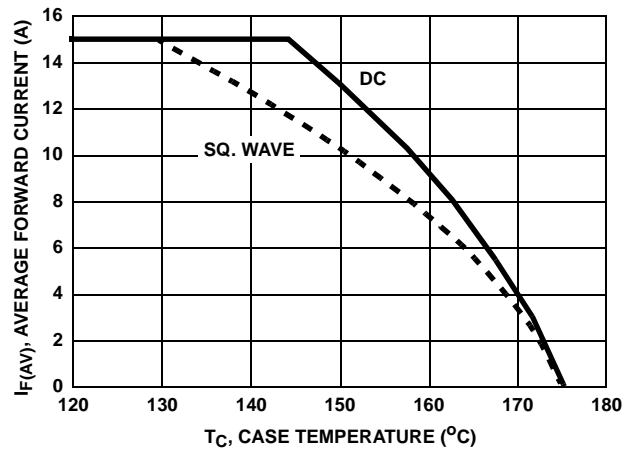FIGURE 3. t_{rr}, t_a AND t_b CURVES vs FORWARD CURRENT

FIGURE 4. CURRENT DERATING CURVE
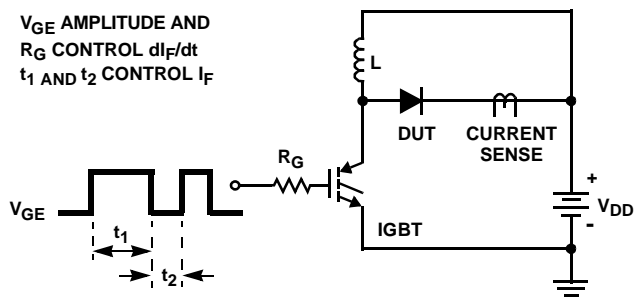
Test Circuits and Waveforms
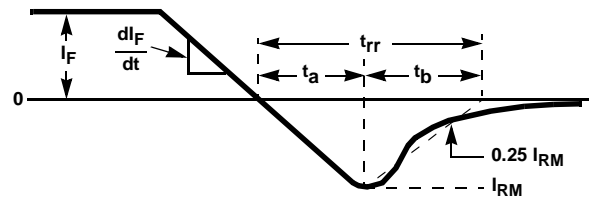

FIGURE 5. t_{rr} TEST CIRCUIT

FIGURE 6. t_{rr} WAVEFORMS AND DEFINITIONS

I = 1A
L = 40mH
R < 0.1Ω
$E_{AVL} = 1/2LI^2 [V_{R(AVL)}/(V_{R(AVL)} - V_{DD})]$
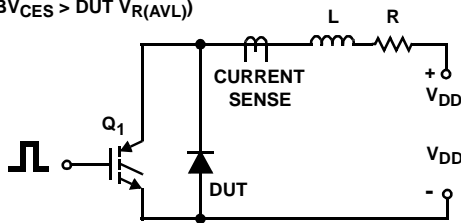Q_1 = IGBT (BV_{CES} > DUT $V_{R(AVL)}$)

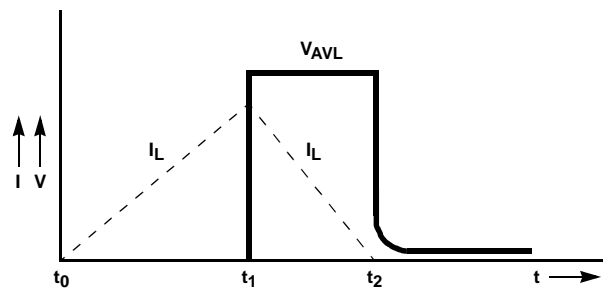FIGURE 7. AVALANCHE ENERGY TEST CIRCUIT

FIGURE 8. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

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CoolFET™	FRFET™	MicroFET™	QFET®	SuperSOT™-8
CROSSVOLT™	GlobalOptoisolator™	MicroPak™	QS™	SyncFET™
DOME™	GTO™	MICROWIRE™	QT Optoelectronics™	TinyLogic®
EcoSPARK™	HiSeC™	MSX™	Quiet Series™	TINYOPTO™
E²CMOS™	I²C™	MSXPro™	RapidConfigure™	TruTranslation™
EnSigna™	i-Lo™	OCX™	RapidConnect™	UHC™
FACT™	ImpliedDisconnect™	OCXPro™	μSerDes™	UltraFET®
FACT Quiet Series™		OPTOLOGIC®	SILENT SWITCHER®	VCX™
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PRODUCT STATUS DEFINITIONS

Definition of Terms

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