

High Current Density Surface Mount Ultrafast Rectifiers



FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Oxide planar chip junction
- Ultrafast recovery times for high frequency
- Low forward voltage drop, low power loss
- Meets MSL level 1 per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer computer, automotive and telecommunication applications.

MECHANICAL DATA

Case: TO-277A (SMPC)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for commercial grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC Q101 qualified), meets JESD 201 class 2 whisker test

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A x 2
V_{RRM}	100 V, 150 V, 200 V
I_{FSM}	30 A
t_{rr}	25 ns
V_F at $I_F = 2.0$ A	0.77 V
T_J max.	150 °C

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)					
PARAMETER	SYMBOL	US4PBC	US4PCC	US4PDC	UNIT
Device marking code		U4BC	U4CC	U4DC	
Maximum repetitive peak reverse voltage	V_{RRM}	100	150	200	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	4.0 2.0			A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	30			A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150			°C



ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Maximum instantaneous forward voltage per diode ⁽¹⁾	I _F = 1.0 A	T _A = 25 °C	V _F	0.89	-	V
	I _F = 2.0 A			0.92	0.98	
	I _F = 1.0 A	T _A = 125 °C		0.73	-	
	I _F = 2.0 A			0.77	0.85	
Maximum reverse current per diode ⁽¹⁾	rated V _R	T _A = 25 °C	I _R	-	5.0	μA
		T _A = 125 °C		0.5	1.0	
Maximum reverse recovery time per diode	I _F = 0.5 A, I _R = 1.0 A, I _{rr} = 0.25 A		t _{rr}	20	25	ns
Typical junction capacitance per diode	4.0 V, 1 MHz		C _J	20	-	pF

Note:

(1) Pulse test: 300 μs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	US4PBC	US4PCC	US4PDC	UNIT
Typical thermal resistance per diode	R _{θJA} ⁽¹⁾	60			°C/W
	R _{θJL}	4			

Note:

(1) Units mounted on recommended P.C.B. 1 oz. pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
US4PDC-E3/86A	0.10	86A	1500	7" diameter plastic tape and reel
US4PDC-E3/87A	0.10	87A	6500	13" diameter plastic tape and reel
US4PDCHE3/86A ⁽¹⁾	0.10	86A	1500	7" diameter plastic tape and reel
US4PDCHE3/87A ⁽¹⁾	0.10	87A	6500	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

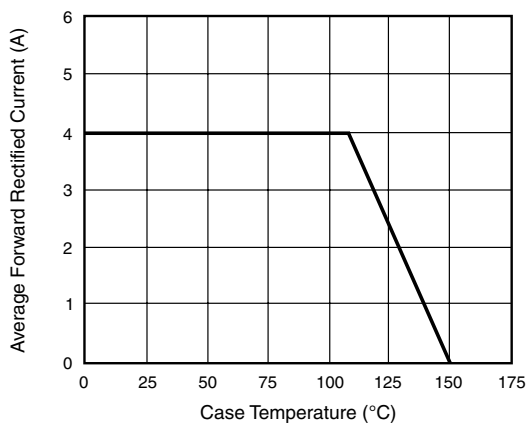


Figure 1. Maximum Forward Current Derating Curve

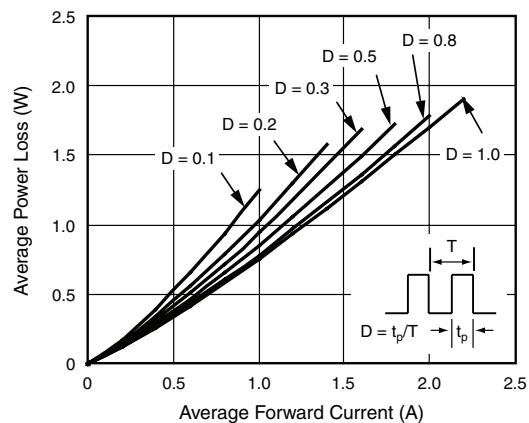


Figure 2. Forward Power Loss Characteristics Per Diode

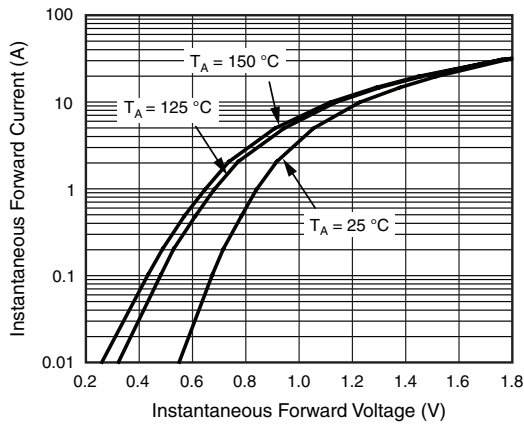


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

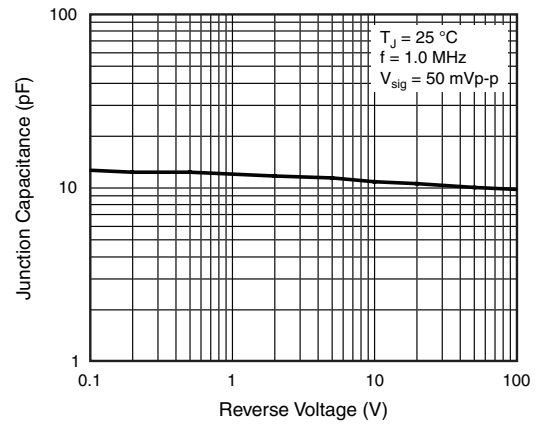


Figure 5. Typical Junction Capacitance Per Diode

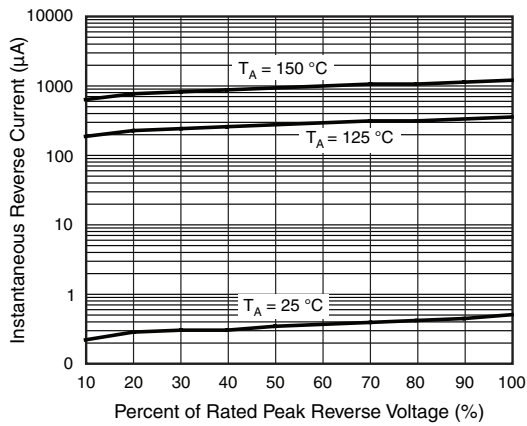


Figure 4. Typical Reverse Leakage Characteristics Per Diode

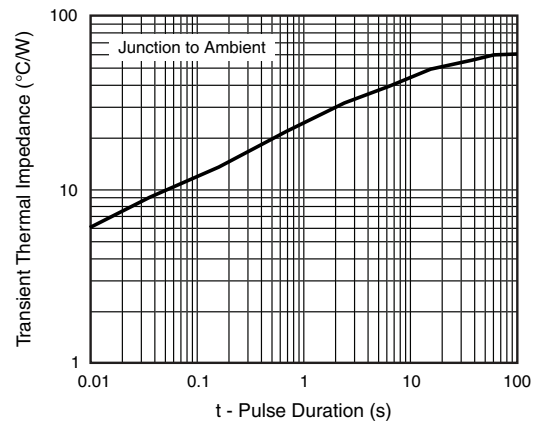


Figure 6. Typical Transient Thermal Impedance Per Diode



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