



THE DATASHEET OF U1C-E3/5AT



Surface Mount Ultrafast Plastic Rectifier


SMA (DO-214AC)

RoHS
 COMPLIANT
 HALOGEN
FREE
FEATURES

- Oxide planar chip junction
- Ultrafast recovery time
- Low forward voltage, low power losses
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching power supplies, freewheeling diodes, DC/DC converters or polarity protection application.

MECHANICAL DATA

Case: SMA (DO-214AC)

Molding compound meets UL 94 V-0 flammability rating
 Base P/N-E3 - RoHS-compliant, commercial grade
 Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

E3 and M3 suffix meets JESD 201 class 2 whisker test

Polarity: color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	100 V, 150 V, 200 V
I_{FSM}	30 A
t_{rr}	15 ns
V_F at $I_F = 1.0$ A	0.76 V
T_J max.	150 °C
Package	SMA (DO-214AC)
Circuit configuration	Single

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)					
PARAMETER	SYMBOL	U1B	U1C	U1D	UNIT
Device marking code		U1B	U1C	U1D	
Maximum repetitive peak reverse voltage	V_{RRM}	100	150	200	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$	1.0			A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30			A
Operating junction and storage temperature range	T_J, T_{STG}	-55 to +150			°C

ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	$I_F = 0.6\text{ A}$	$T_A = 25\text{ }^\circ\text{C}$	$V_F^{(1)}$	0.82	0.87	V
	$I_F = 1.0\text{ A}$			0.87	0.92	
	$I_F = 0.6\text{ A}$	$T_A = 100\text{ }^\circ\text{C}$		0.71	0.78	
	$I_F = 1.0\text{ A}$			0.76	0.84	
Reverse current	Rated V_R	$T_A = 25\text{ }^\circ\text{C}$	$I_R^{(2)}$	-	5.0	μA
		$T_A = 100\text{ }^\circ\text{C}$		55	100	
Reverse recovery time	$I_F = 0.5\text{ A}, I_R = 1.0\text{ A}, I_{rr} = 0.25\text{ A}$	$T_A = 25\text{ }^\circ\text{C}$	t_{rr}	-	15	ns
	$I_F = 0.6\text{ A}, dI/dt = 50\text{ A}/\mu\text{s}, V_R = 30\text{ V}, I_{rr} = 0.1 I_{RM}$	$T_A = 25\text{ }^\circ\text{C}$		24	-	
		$T_A = 100\text{ }^\circ\text{C}$		29	-	
Storage charge	$I_F = 0.6\text{ A}, dI/dt = 50\text{ A}/\mu\text{s}, V_R = 30\text{ V}, I_{rr} = 0.1 I_{RM}$	$T_A = 25\text{ }^\circ\text{C}$	Q_{rr}	7	-	nC
		$T_A = 100\text{ }^\circ\text{C}$		13	-	
Typical junction capacitance	4.0 V, 1 MHz		C_J	6.8	-	pF

Notes

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
 (2) Pulse test: Pulse width $\leq 40\text{ ms}$

THERMAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)					
PARAMETER	SYMBOL	U1B	U1C	U1D	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)}$	115			$^\circ\text{C}/\text{W}$
	$R_{\theta JM}^{(1)}$	22			

Note

- (1) Free air, mounted on recommended copper pad area

ORDERING INFORMATION (Example)					
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE	
U1D-E3/61T	0.064	61T	1800	7" diameter plastic tape and reel	
U1D-E3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel	
U1D-M3/61T	0.064	61T	1800	7" diameter plastic tape and reel	
U1D-M3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel	

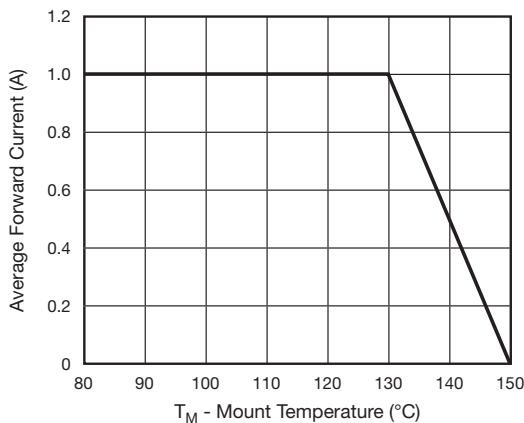
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)


Fig. 1 - Forward Derating Curve

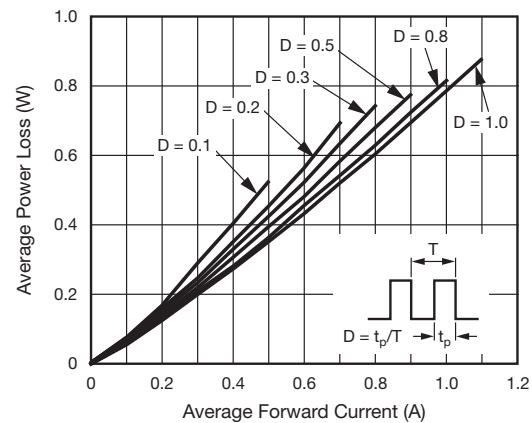


Fig. 2 - Forward Power Loss Characteristics

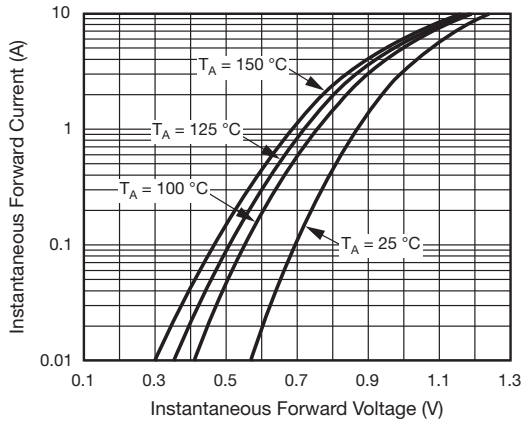


Fig. 3 - Typical Instantaneous Forward Characteristics

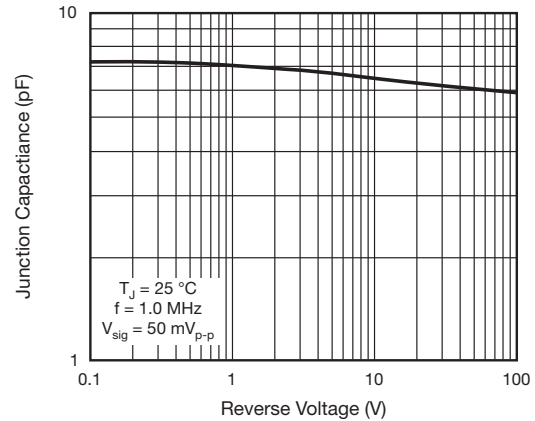


Fig. 5 - Typical Junction Capacitance

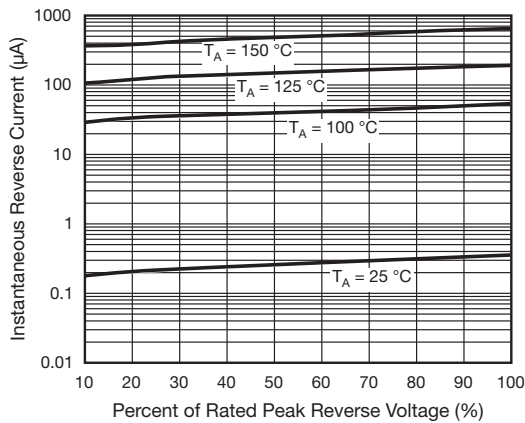


Fig. 4 - Typical Reverse Characteristics

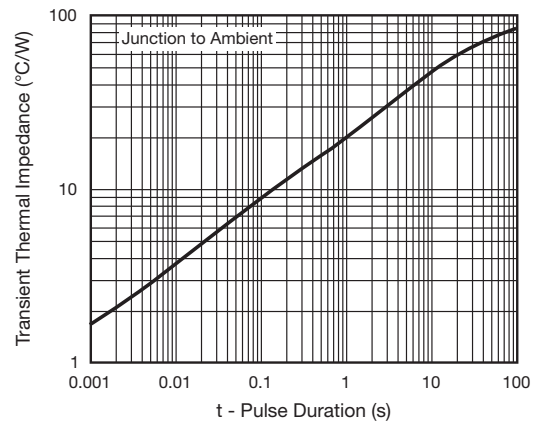
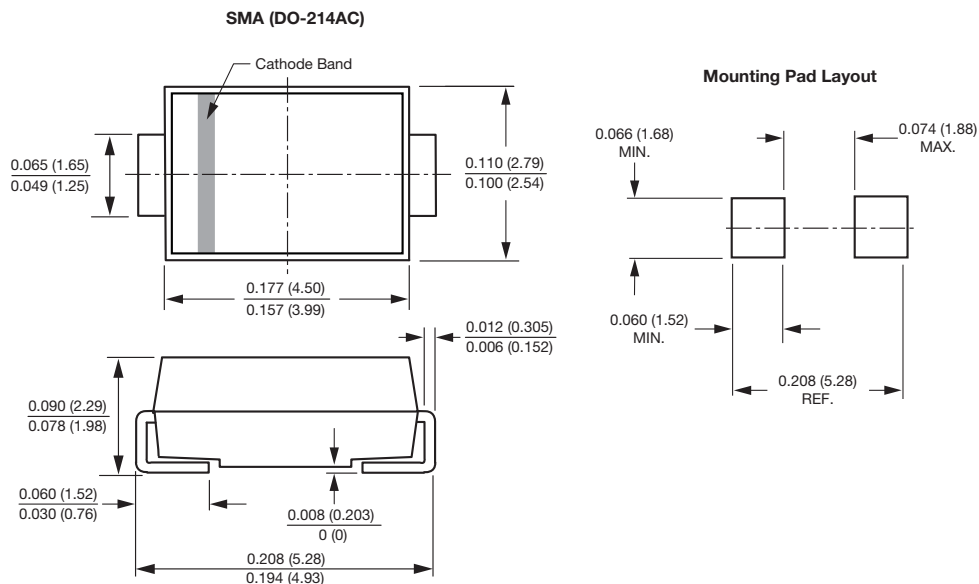


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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