

12A, 650V SiC Merged PIN Schottky Diode

FEATURES

- Max junction temperature 175°C
- MPS structure for high ruggedness to forward current surge events
- High-speed switching possible
- High forward surge capability
- High-frequency operation
- Positive temperature coefficient on V_f
- RoHS compliant
- Halogen-free

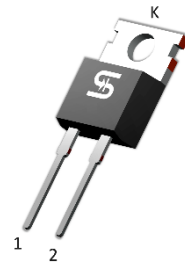
APPLICATIONS

- General purpose
- Switch mode power supplies
- Power factor correction

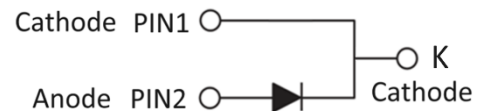
MECHANICAL DATA

- Case: TO-220AC-2L
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Polarity: As circuit diagram
- Weight: 2.03g (approximately)

KEY PARAMETERS		
PARAMETER	VALUE	UNIT
I_F	12	A
V_{RRM}	650	V
I_{FSM}	88	A
$T_{J\ MAX}$	175	°C
Package	TO-220AC-2L	
Configuration	Single die	



TO-220AC-2L



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Repetitive peak reverse voltage	V_{RRM}	650	V
Reverse voltage, total rms value	$V_{R(RMS)}$	455	V
Continuous Rectified Forward Current @ $T_J = 151^\circ\text{C}$	I_F	12	A
Surge peak forward current 10ms single half sine-wave superimposed on rated load	$T_C = 25^\circ\text{C}$	I_{FSM}	88
	$T_C = 125^\circ\text{C}$		68
Junction temperature	T_J	-55 to +175	°C
Storage temperature	T_{STG}	-55 to +175	°C

THERMAL PERFORMANCE				
PARAMETER	SYMBOL	TYP	MAX	UNIT
Junction-to-case thermal resistance	$R_{\theta JC}$	1.20	1.44	$^{\circ}C/W$

ELECTRICAL SPECIFICATIONS ($T_A = 25^{\circ}C$ unless otherwise noted)					
PARAMETER	CONDITIONS	SYMBOL	TYP	MAX	UNIT
Forward voltage ⁽¹⁾	$I_F = 6A, T_J = 25^{\circ}C$	V_F	1.15	-	V
	$I_F = 12A, T_J = 25^{\circ}C$		1.36	1.45	V
	$I_F = 6A, T_J = 150^{\circ}C$		1.19	-	V
	$I_F = 12A, T_J = 150^{\circ}C$		1.57	-	V
	$I_F = 6A, T_J = 175^{\circ}C$		1.21	-	V
	$I_F = 12A, T_J = 175^{\circ}C$		1.65	1.85	V
Reverse current @ rated V_R ⁽²⁾	$T_J = 25^{\circ}C$	I_R	-	20	μA
	$T_J = 175^{\circ}C$		-	200	μA
Junction capacitance	$f = 1MHz, V_R = 1V$	C_J	490	-	pF
	$f = 1MHz, V_R = 200V$		78.0	-	pF
	$f = 1MHz, V_R = 400V$		55.3	-	pF
Capacitive Charge	$V_R = 400V$	Q_C	37.2	-	nC

Notes:

1. Pulse test with $PW = 0.3ms$
2. Pulse test with $PW = 30ms$

ORDERING INFORMATION		
ORDERING CODE	PACKAGE	PACKING
TSCDT12065G1	TO-220AC-2L	50 / Tube

CHARACTERISTICS CURVES

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

Fig.1 Typical Forward Characteristics

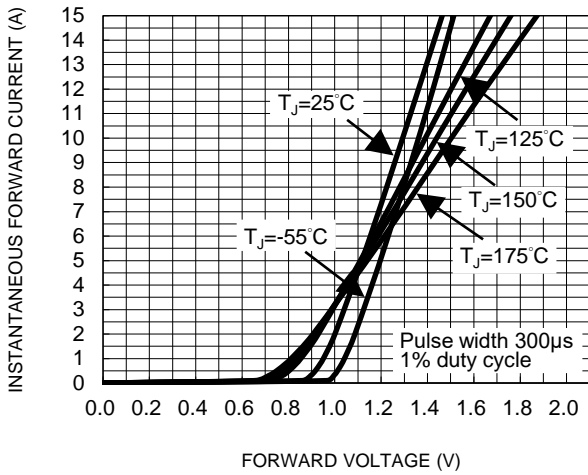


Fig.2 Typical Reverse Characteristics

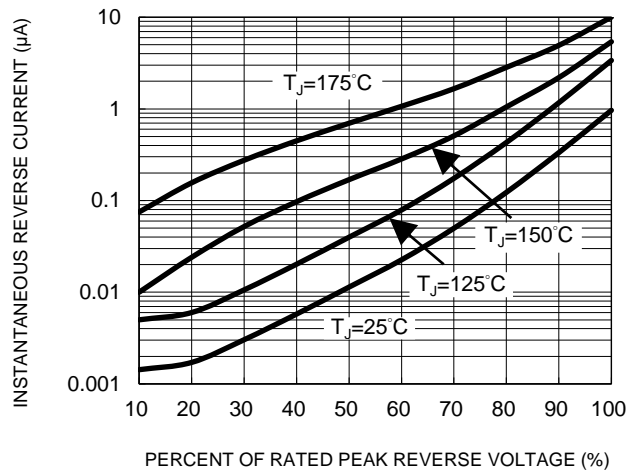


Fig.3 Peak forward current versus case temperature

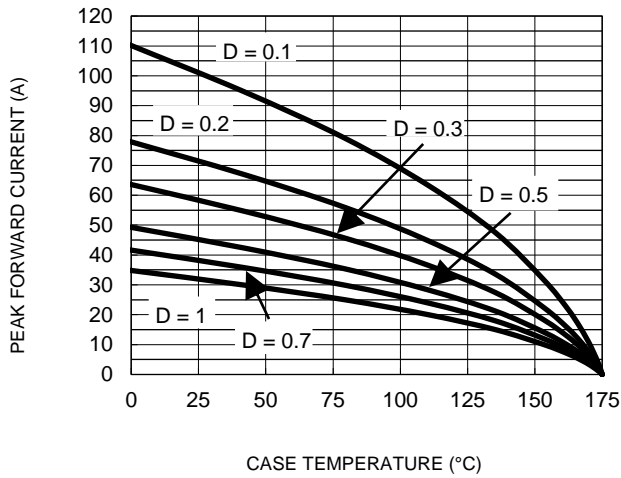


Fig.4 Typical Junction Capacitance

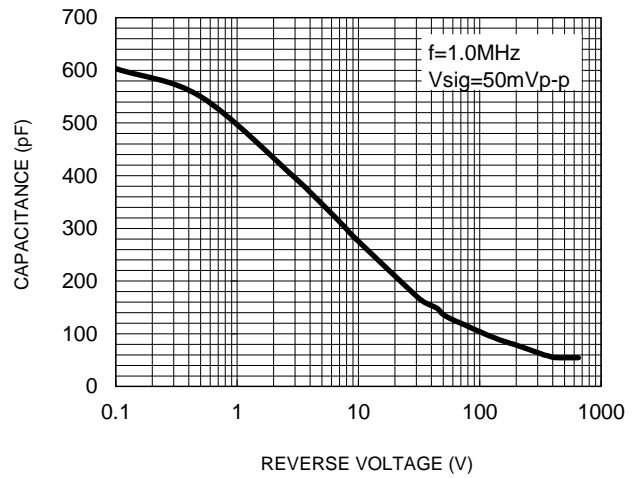


Fig.5 Typical Capacitive Charge

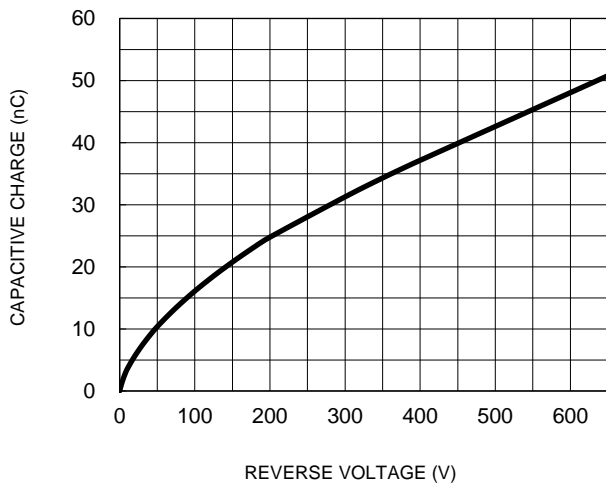
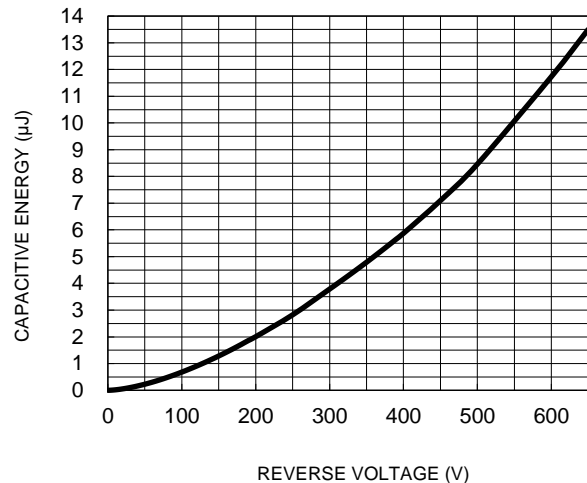


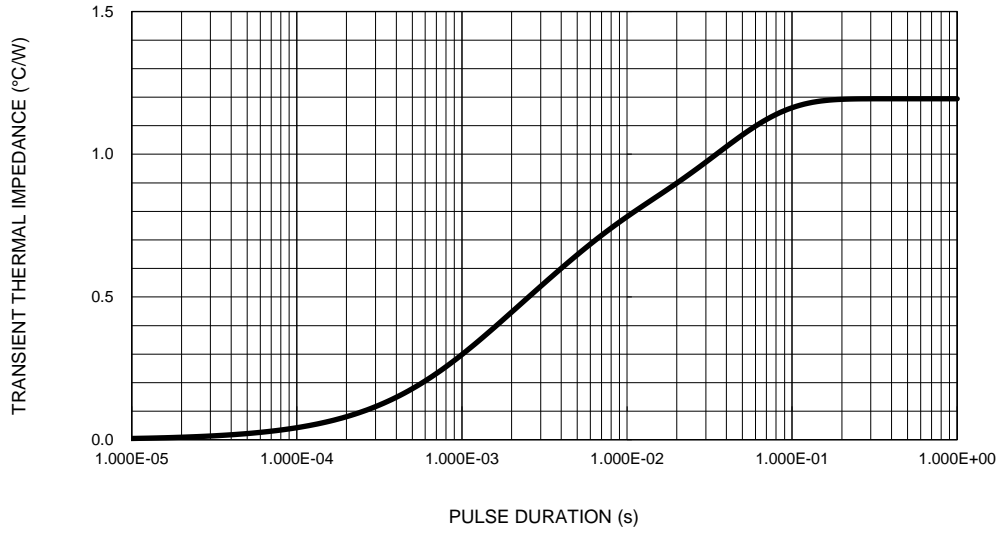
FIG.6 Typical Capacitance Stored Energy



CHARACTERISTICS CURVES

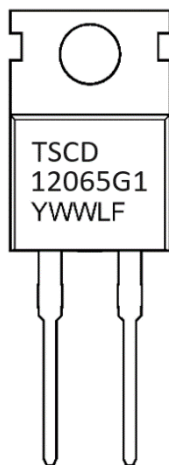
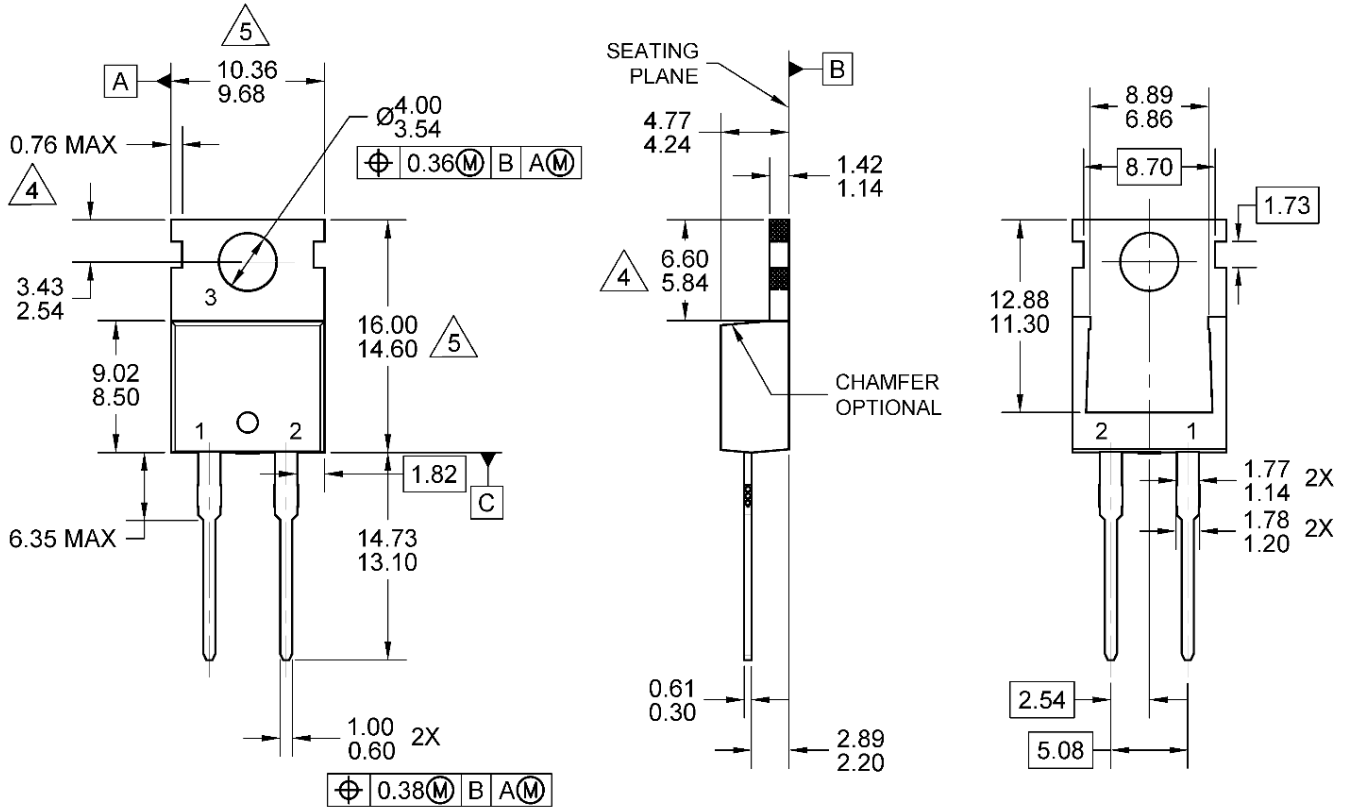
($T_A = 25^\circ\text{C}$ unless otherwise noted)

Fig.7 Typical Transient Thermal Characteristics



PACKAGE OUTLINE DIMENSIONS

TO-220AC-2L



MARKING DIAGRAM

Y = YEAR CODE
 WW = WEEK CODE (01~52)
 L = LOT CODE (1~9, A~Z)
 F = FACTORY CODE

NOTES: UNLESS OTHERWISE SPECIFIED

- ALL DIMENSIONS ARE IN MILLIMETERS.
- DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
- PACKAGE OUTLINE REFERENCE: JEDEC TO-220, VARIATION AC, ISSUE K.
- THE DEFINED ZONE WHERE STAMPING AND SINGULATION IRREGULARITIES ARE ALLOWED. SLOT AND NOTCH MAY APPEAR IN THIS ZONE.
- THIS DO NOT INCLUDE MOLD FLASH. THESE DIMENSIONS ARE MEASURED AT THE OUTERMOST EXTREME OF THE PLASTIC BODY.
- DWG NO REF: HQ2SD07-TO220ACSiC-119 REV A.

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