40A, 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

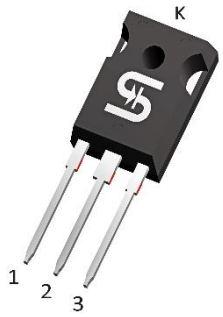
APPLICATIONS

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

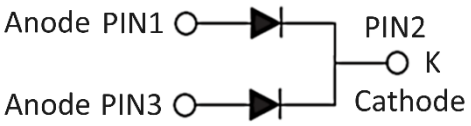
MECHANICAL DATA

- Case: TO-247-3L
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Polarity: As circuit diagram
- Weight: 6.30g (approximately)

KEY PARAMETERS		
PARAMETER	**VALUE**	**UNIT**
I_F	40	A
V_{RRM}	650	V
I_{FSM}	140	A
$T_{J\ MAX}$	175	°C
Package	TO-247-3L	
Configuration	Common cathode	



TO-247-3L



ABSOLUTE MAXIMUM RATINGS (T_A = 25°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 = 156°C per leg / per device		I_F	20 / 40	A
Surge peak forward current 10ms single half sine-wave superimposed on rated load	T_C = 25°C	I_{FSM}	140	A
	T_C = 125°C		124	A
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 per leg	$R_{\Theta JC}$	0.59	0.71	°C/W

ELECTRICAL SPECIFICATIONS (T_A = 25°C unless otherwise noted)

PARAMETER	CONDITIONS	SYMBOL	TYP	MAX	UNIT
Forward voltage per leg(1)	I_F = 10A, T_J = 25°C	V_F	1.16	-	V
	I_F = 20A, T_J = 25°C		1.33	1.45	V
	I_F = 10A, T_J = 150°C		1.17	-	V
	I_F = 20A, T_J = 150°C		1.52	-	V
	I_F = 10A, T_J = 175°C		1.20	-	V
	I_F = 20A, T_J = 175°C		1.60	1.85	V
Reverse current @ rated V_R per leg(2)	T_J = 25°C	I_R	-	20	μA
	T_J = 175°C		-	200	μA
Junction capacitance per leg	f = 1MHz, V_R = 1V	C_J	925	-	pF
	f = 1MHz, V_R = 200V		134	-	pF
	f = 1MHz, V_R = 400V		94	-	pF
Capacitive Charge per leg	V_R = 400V	Q_C	65	-	nC

Notes:

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

ORDERING INFORMATION

ORDERING CODE	PACKAGE	PACKING
TSCDH40065G1	TO-247-3L	30 / Tube

CHARACTERISTICS CURVES

(T_A = 25°C unless otherwise noted)

Fig.1 Typical Forward Characteristics

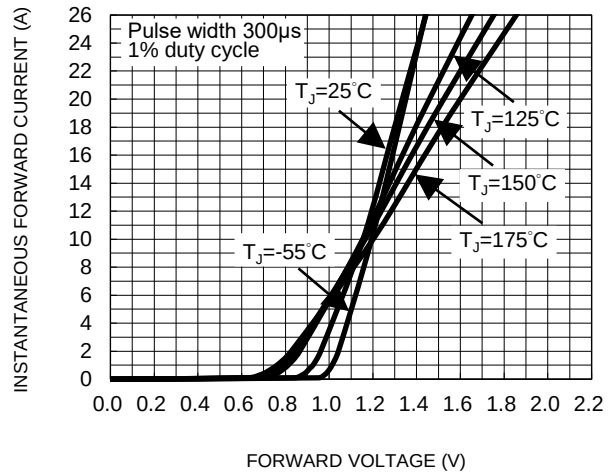


Fig.2 Typical Reverse Characteristics

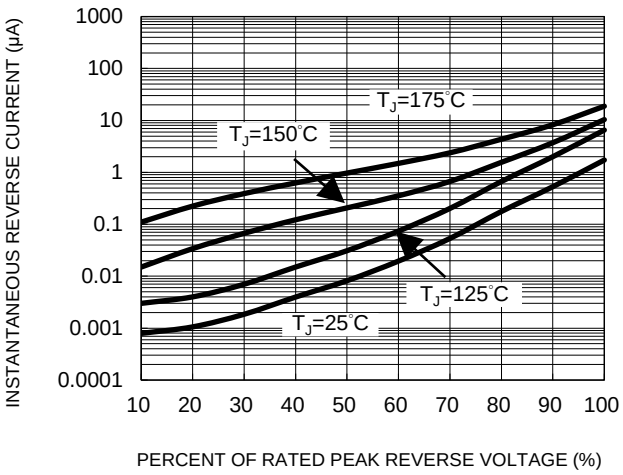


Fig.3 Peak forward current versus case temperature

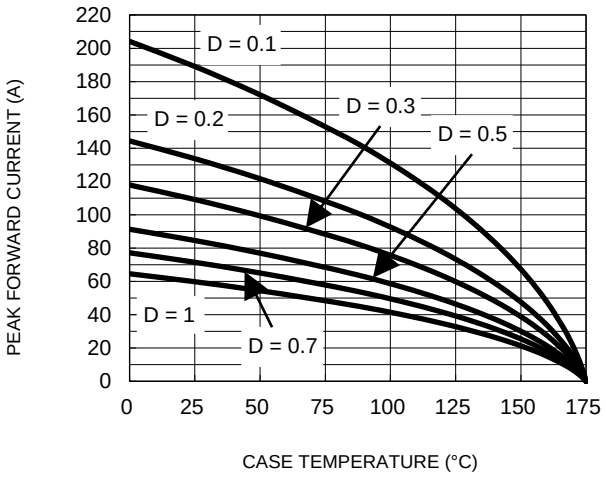


Fig.4 Typical Junction Capacitance

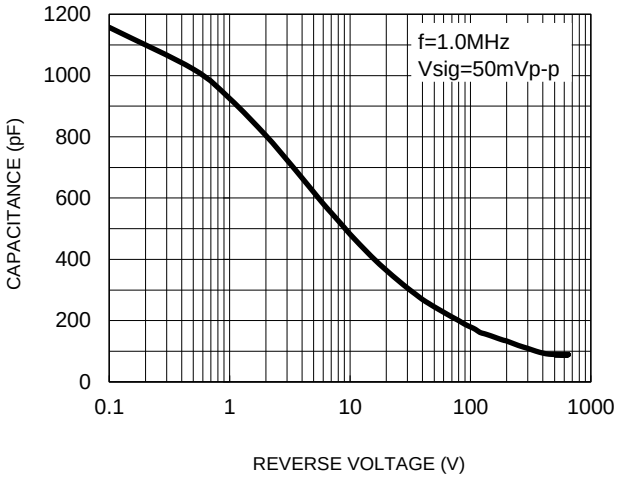


Fig.5 Typical Capacitive Charge

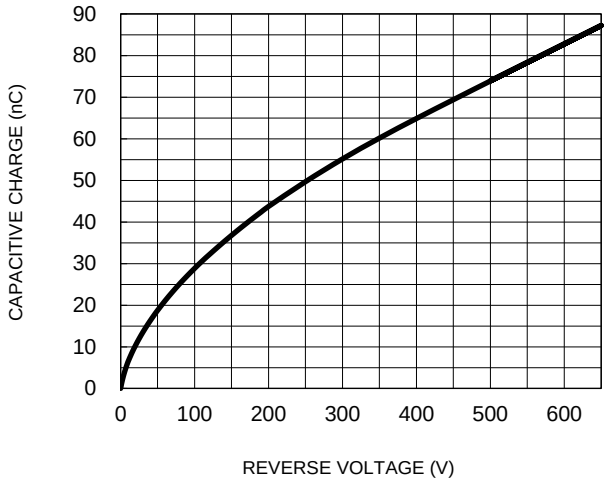
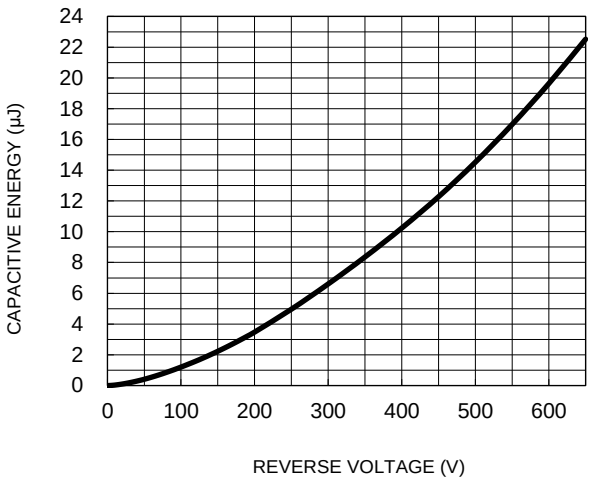


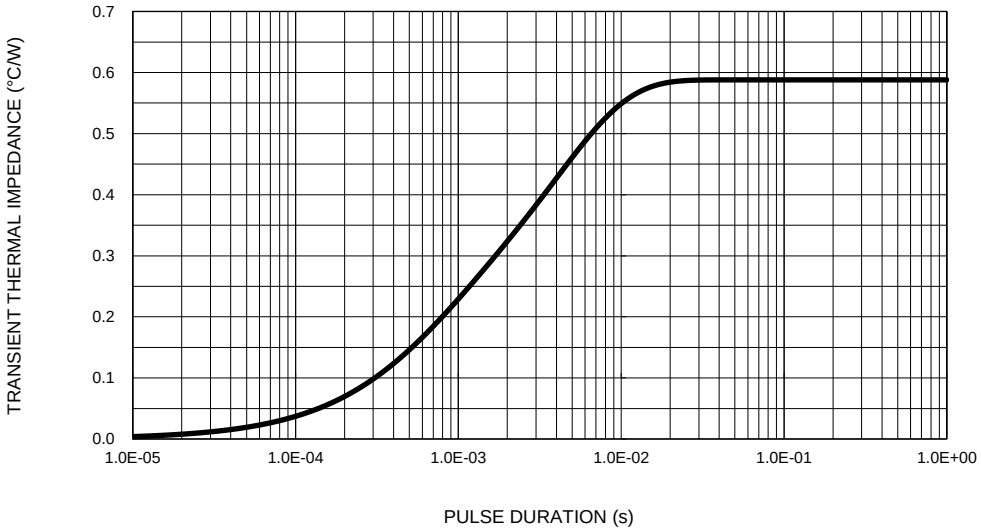
FIG.6 Typical Capacitance Stored Energy



CHARACTERISTICS CURVES

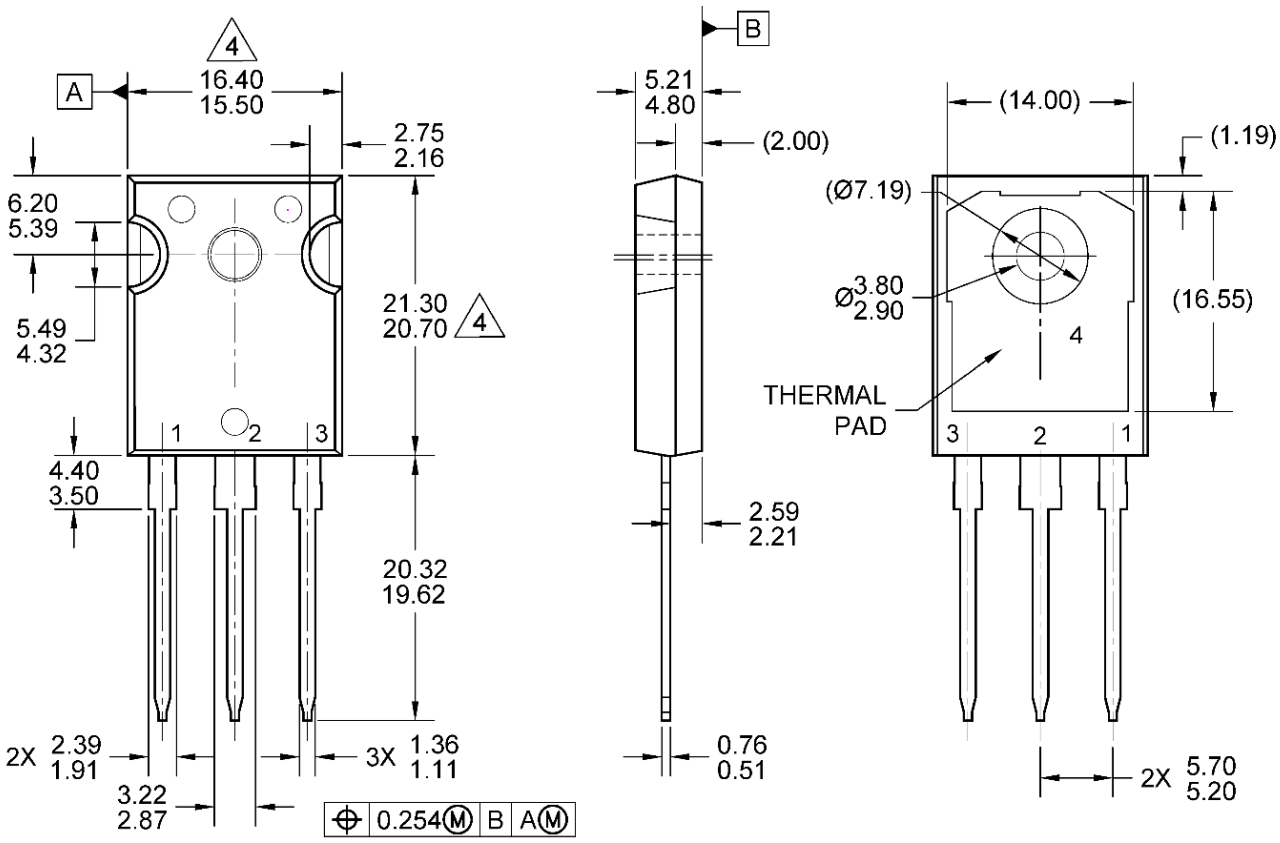
(T_A = 25°C unless otherwise noted)

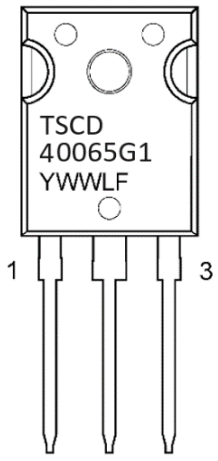
Fig.7 Typical Transient Thermal Characteristics



PACKAGE OUTLINE DIMENSIONS

TO-247-3L





MARKING DIAGRAM

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

NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
3. PACKAGE OUTLINE REFERENCE: JEDEC TO-247, VARIATION AD, ISSUE E.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH. THESE DIMENSIONS ARE MEASURED AT THE OUTERMOST EXTREME OF THE PLASTIC BODY.
5. DWG NO. REF: HQ2SD07-TO247ADSiC-122 REV A.

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