MOSPEC

97N40E

40V N-channel Power SGT MOSFET

DESCRIPTION：

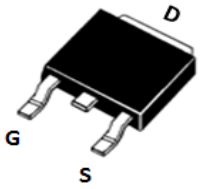
·Excellent $R_{DS(ON)}$ and Low Gate Charge

·100% UIS Tested

·100% AVds Tested

·Halogen-free; RoHS-compliant

V_{DSS}	40V
I_D	97A
$R_{DS(ON)_Typ.}$ @V_{GS}=10V	4.1mΩ



TO-252

TYPICAL APPLICATIONS：

·Load Switch

·PWM Application

·Power management

MAXIMUM RATINGS (at T_C = 25 °C, unless otherwise specified)

Characteristic	Condition	Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	Tc=25℃ Tc=100℃	I_D	97 61	A
Pulsed Drain Current (1)		I_{DM}	Refer to Fig.4	A
Power dissipation	Tc=25℃ Tc=100℃	P_D	83 33	W
Junction Temperature		T_J	-55~+150	℃
Storage temperature Range		T_{STG}	-55~+150	℃

Notes： 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

2. EAS condition: Starting TJ=25C, VDD=20V, VG=10V, RG=25ohm, L=3mH, IAS=8.4A, VDD=0V during time in avalanche.

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction to Ambient Junction to Case	$R_{\theta JA}$ $R_{\theta JC}$	40 1.5	℃/W

ELECTRICAL CHARATERISTICS (at T_J = 25 °C, unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage VGS = 0V, ID = 250uA	$V_{(BR)DSS}$	40			V
Zero Gate Voltage Drain Current VDS = 32 V, VGS = 0 V	I_{DSS}			1	uA
Gate-Source Leakage Current VGS = ±20V, VDS = 0V	I_{GSS}			±100	nA
Gate-Source threshold voltage VDS = VGS, ID = 250uA	$V_{GS(th)}$	1.2	1.7	2.2	V
Drain-Source On-State Resistance VGS = 10V, ID = 20A VGS = 4.5V, ID = 20A	$R_{DS(on)}$		4.1 5.6	5.4 7.3	mΩ
Gate Resistance f=1MHz	R_g		1.5		Ω
Input capacitance f=1MHz, VDS=20 V, VGS=0 V	C_{iss}		1361	1837	pF
Output capacitance f=1MHz, VDS=20 V, VGS=0 V	C_{oss}		690	931	pF
Reverse transfer capacitance f=1MHz, VDS=20 V, VGS=0 V	C_{rss}		67	90	pF
Total Gate Charge VDS= 20V, ID= 20A, VGS= 0 to 10V	Q_G		25	33	nC
Gate to Source Charge VDS= 20V, ID= 20A, VGS=0 to 10V	Q_{GS}		4.2		nC
Gate to Drain Charge VDS= 20V, ID= 20A, VGS= 0 to 10V	Q_{GD}		5.9		nC
Turn-on delay time VDS=20 V, ID=20A, VGS= 10V, R_G=3Ω	$td_{(ON)}$		13		ns
Rise time VDS=20 V, ID=20A, VGS= 10V, R_G=3Ω	tr		43		ns
Turn-off delay time VDS=20 V, ID=20A, VGS= 10V, R_G=3Ω	$td_{(OFF)}$		20		ns
Fall time VDS=20 V, ID=20A, VGS= 10V, R_G=3Ω	tf		14		ns
Maximum Continuous Body Diode Forward Current	IS			97	A
Maximum Pulsed Body Diode Forward Current	ISM			388	A
Diode Forward Voltage VGS = 0V, I_S =20A	V_{SD}			1.2	V
Body Diode Reverse Recovery Time IF = 20A, di/dt = 100A/us	trr	17	29	39	ns
Body Diode Reverse Recovery Charge IF = 20A, di/dt = 100A/us	Qrr		17		nC

Typical Performance Characteristics

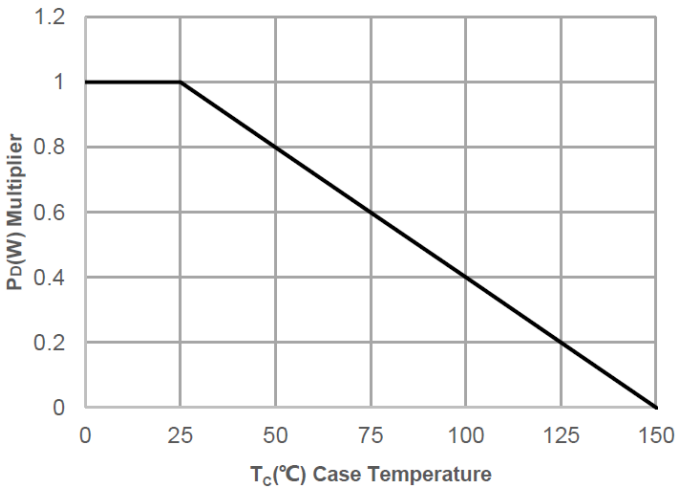


Figure 1: Power De-rating

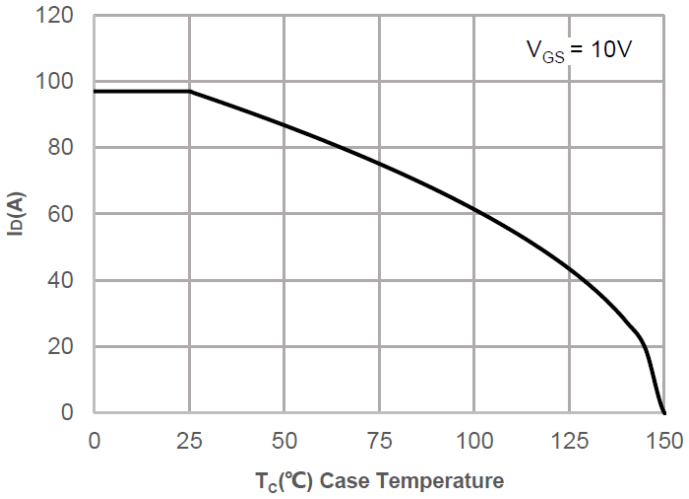


Figure 2: Current De-rating

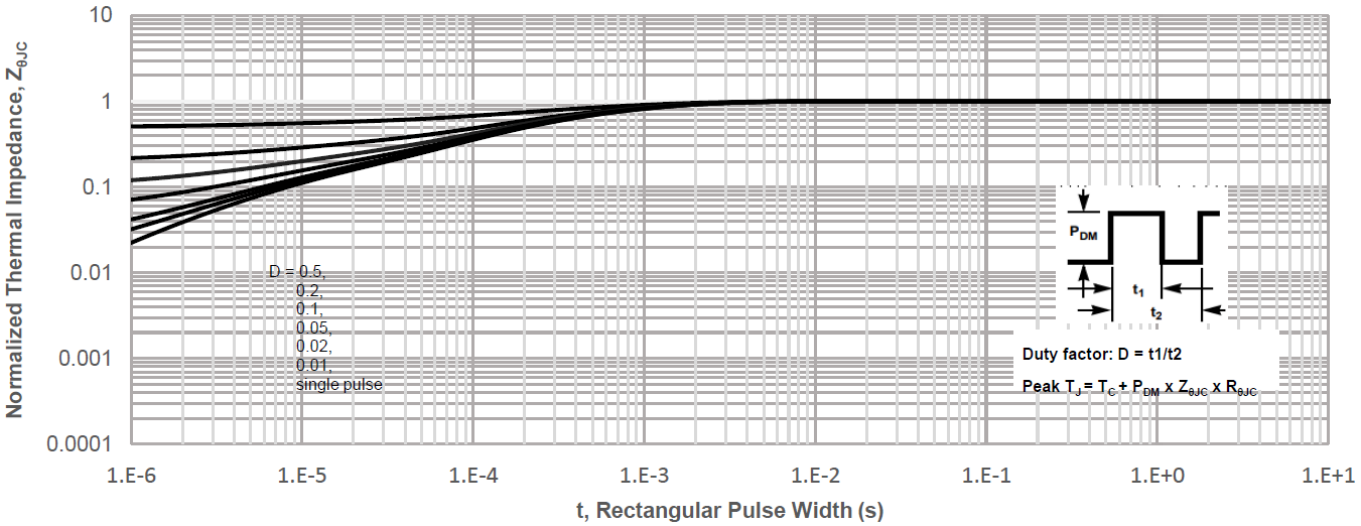


Figure 3: Normalized Maximum Transient Thermal Impedance

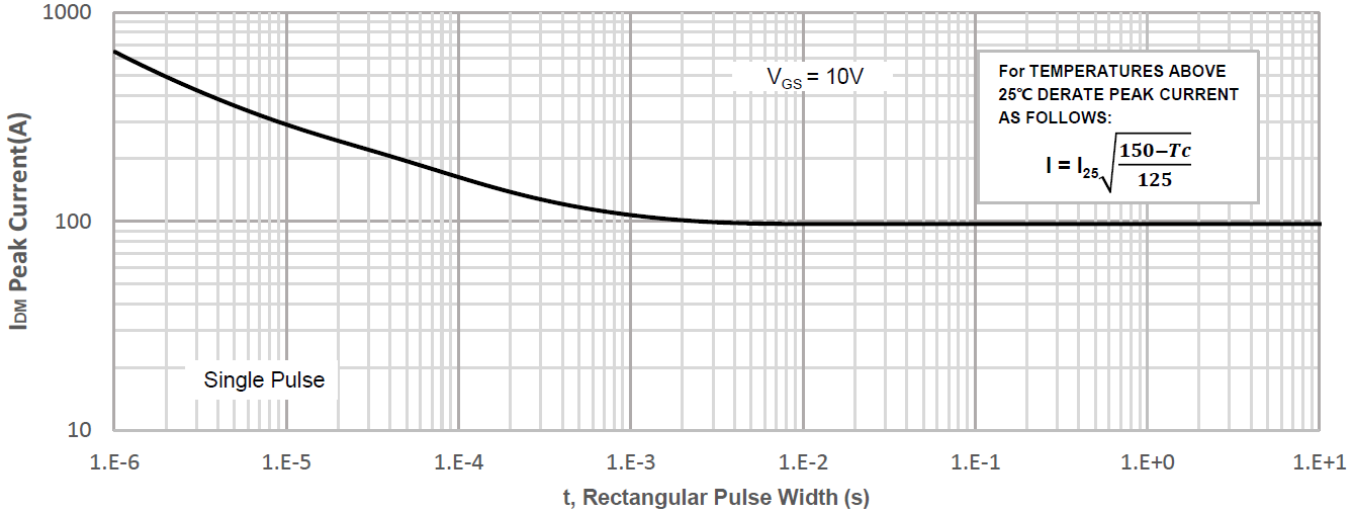


Figure 4: Peak Current Capacity

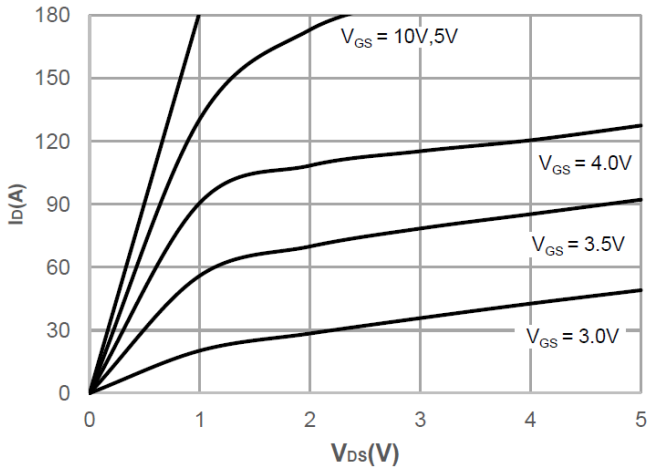


Figure 5: Output Characteristics

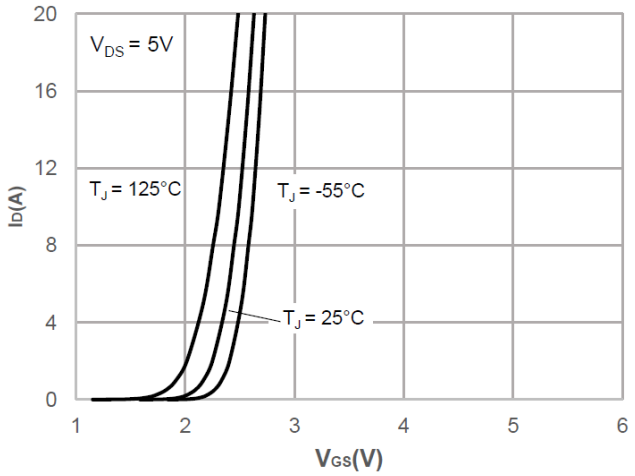


Figure 6: Typical Transfer Characteristics

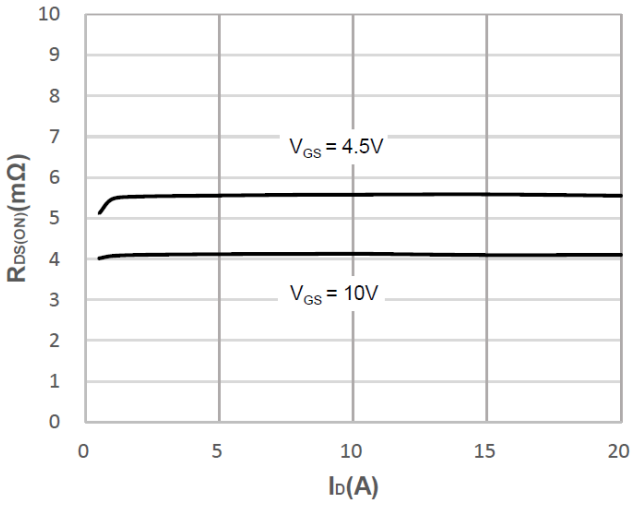


Figure 7: On-resistance vs. Drain Current

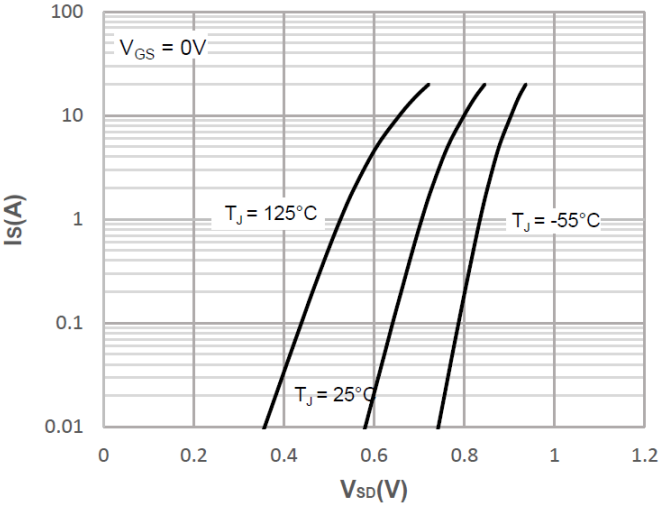


Figure 8: Body Diode Characteristics

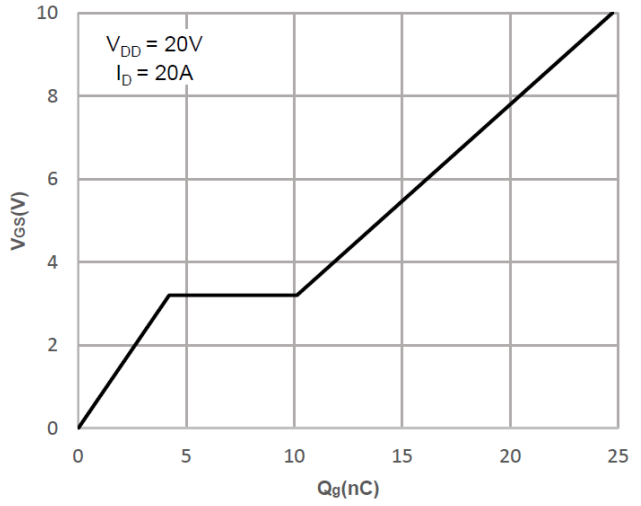


Figure 9: Gate Charge Characteristics

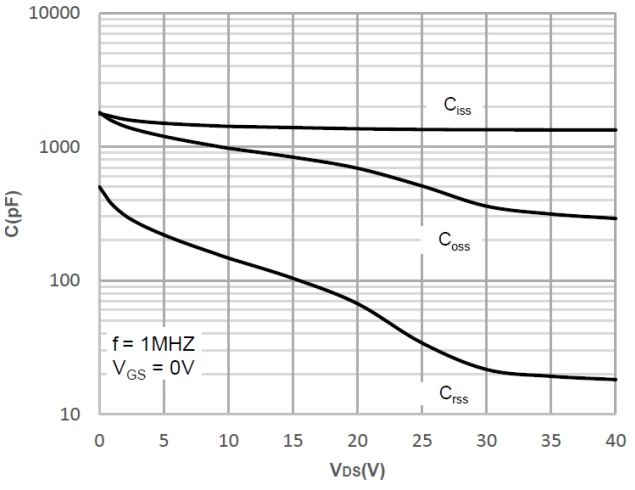


Figure 10: Capacitance Characteristics

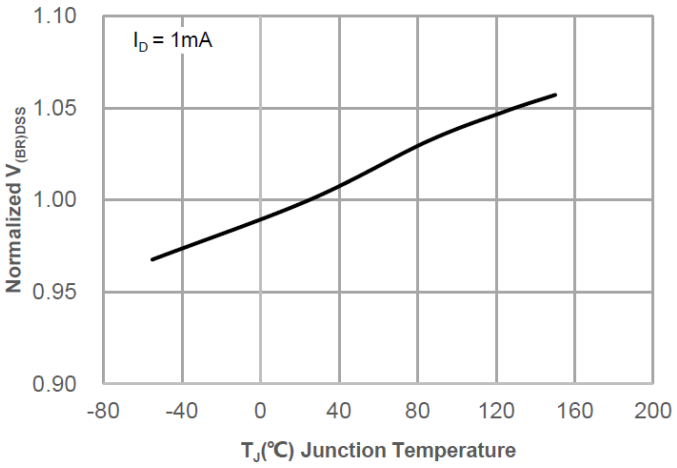


Figure 11: Normalized Breakdown voltage vs. Junction Temperature

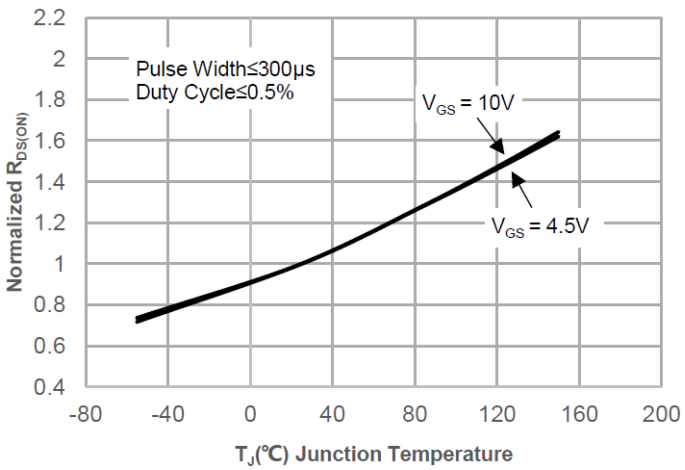


Figure 12: Normalized on Resistance vs. Junction Temperature

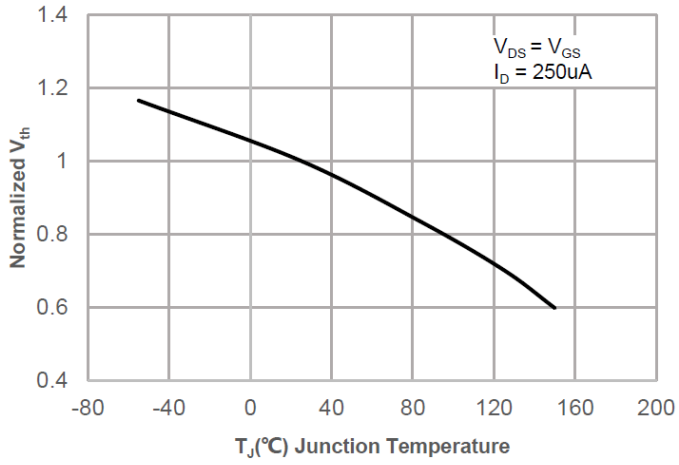


Figure 13: Normalized Threshold Voltage vs. Junction Temperature

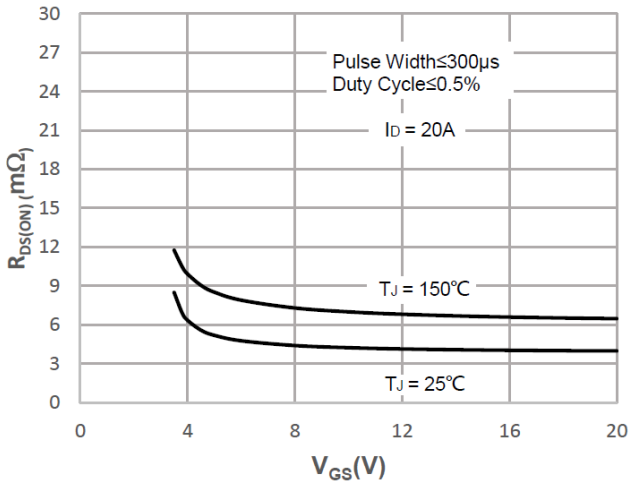


Figure 14:$R_{DS(ON)}$ vs. V_{GS}

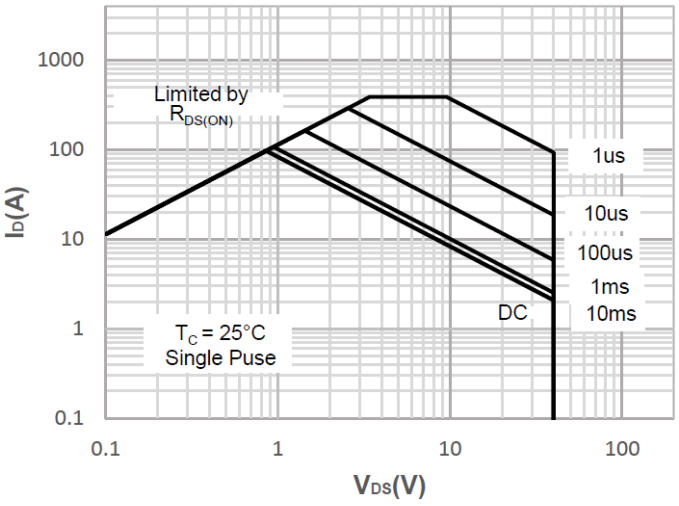
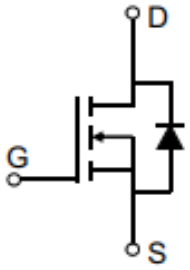
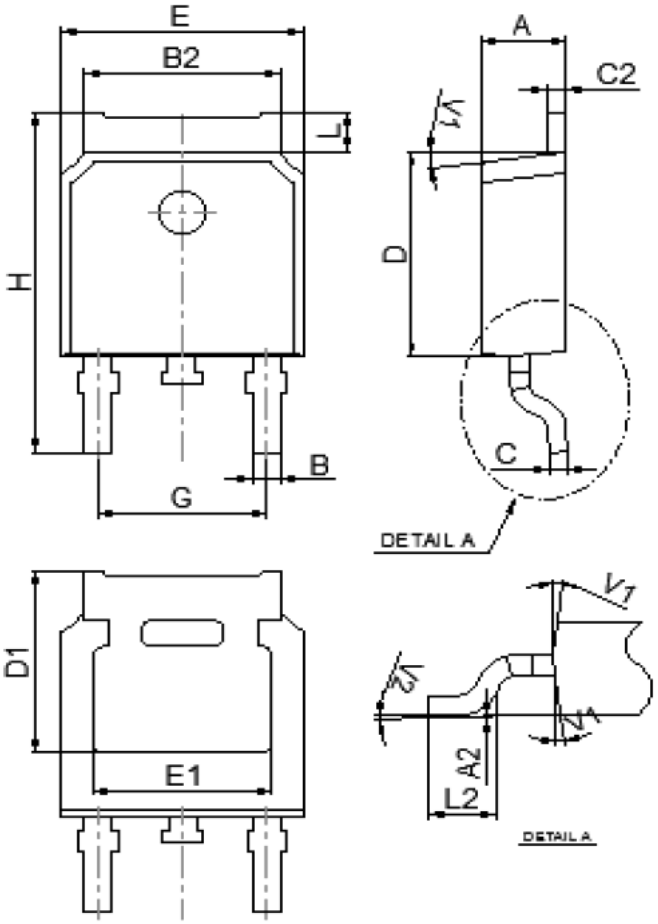


Figure 15: Maximum Safe Operating Area

·Circuit diagram



·Package outlines : Dimensions in (mm)



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.15	0		0.006
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

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