

Features

- High Speed Power Smooth Switching
- Enhanced Body diode dv/dt capability
- Enhanced Avalanche Ruggedness

Application

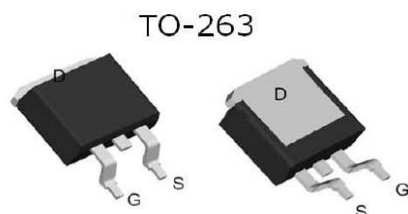
- Brushed and BLDC Motor drive systems
- Battery Management
- DC/DC and AC/DC Converter
- UPS

Product Summary

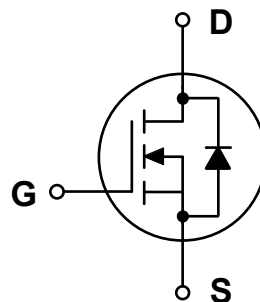
V_{DS}	150V
$R_{DS(on)}$	6.0mΩ
I_D	140A

100% DVDS Tested

100% Avalanche Tested



SFB070N150C3



Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
SFB070N150C3	070N150C3	TO-263	Reel&Tape	330×24.8mm	24mm	800pcs

Absolute Maximum Ratings

Parameter		Symbol	Value	Unit
Drain - Source Voltage		V_{DS}	150	V
Gate - Source Voltage		V_{GS}	±20	V
Continuous Drain Current	$T_C = 25^{\circ}\text{C}$	I_D	140	A
	$T_C = 100^{\circ}\text{C}$		99	
Pulsed Drain Current($T_C=25^{\circ}\text{C}$, t_p limited by T_{jmax})		$I_{D,Pulse}$	500	A
Single Pulsed Avalanche Energy($L=0.4\text{mH}$, $T_C=25^{\circ}\text{C}$)		E_{AS}	405	mJ
Power Dissipation	$T_C = 25^{\circ}\text{C}$	P_{tot}	300	W
Junction Temperature		T_J	175	$^{\circ}\text{C}$
Storage Temperature		T_{STG}	-55~ +175	$^{\circ}\text{C}$

Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance , junction – case	R_{thJC}	0.5	°C/W
Thermal resistance , junction – ambient(min. footprint)	R_{thJA}	60	°C/W

Electrical Characteristics ($T_J = 25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
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Static Characteristics

Drain - Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	150	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 150V, V_{GS} = 0V$ $T_J = 25^{\circ}\text{C}$ $T_J = 100^{\circ}\text{C}$	- - -	- - -	1 100	μA
Gate - Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2	3	4	V
Drain-source On-resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$ TO-263	-	6	7	mΩ
Forward Transconductance	g_{FS}	$V_{DS} = 5V, I_D = 20A$	-	75	-	S

Dynamic Characteristics

Input Capacitance	C_{iss}	$V_{DS} = 75V, V_{GS} = 0V, f = 1\text{MHz}$	-	5369	-	pF
Output Capacitance	C_{oss}		-	386	-	
Reverse Transfer Capacitance	C_{rss}		-	11	-	
Gate Resistance	R_g	$V_{DS} = 0V, V_{GS} = 0V, f = 1\text{MHz}$	-	2.8	-	Ω

Switching Characteristics

Total Gate Charge	Q_g	$V_{DS} = 75V, V_{GS} = 10V, I_D = 20A,$ $f = 1\text{MHz}$	-	64	-	nC
Gate-source Charge	Q_{gs}		-	20	-	
Gate-drain Charge	Q_{gd}		-	9	-	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 75V, V_{GS} = 10V, I_D = 20A,$ $R_G = 10\Omega$	-	23	-	ns
Turn-on Rise Time	t_r		-	22	-	
Turn-off Delay Time	$t_{d(off)}$		-	32	-	
Turn-off Fall Time	t_f		-	15	-	

Body Diode Characteristic

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Diode continuous forward current	I_S	-	-	-	140	A
Diode pulse current	$I_{S,pulse}$	Pulsed; $t_p \leq 10 \mu s$	-	-	500	A
Body Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_{SD} = 20A$	-	0.9	1.2	V
Body Diode Reverse Recovery Time	T_{rr}	$I_F = 20A, dI/dt = 100A/\mu s$	-	75	-	ns
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F = 20A, dI/dt = 100A/\mu s$	-	150	-	nC

Typical Performance Characteristics

Fig 1. Typical Output Characteristics

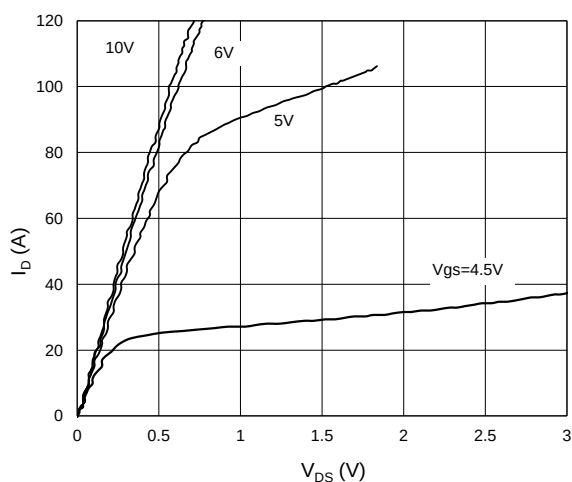


Figure 2. On-Resistance vs. Gate-Source Voltage

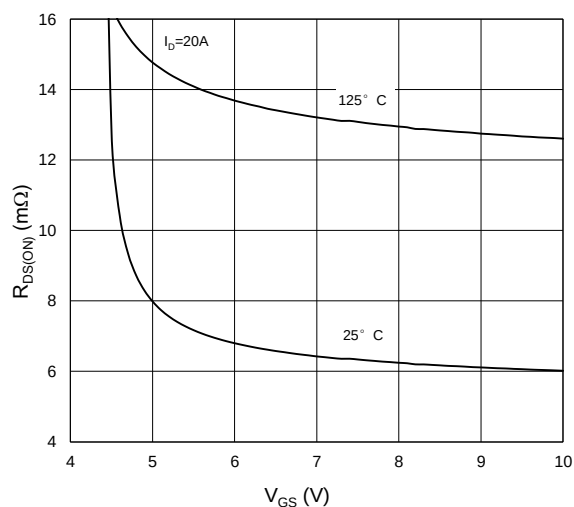


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

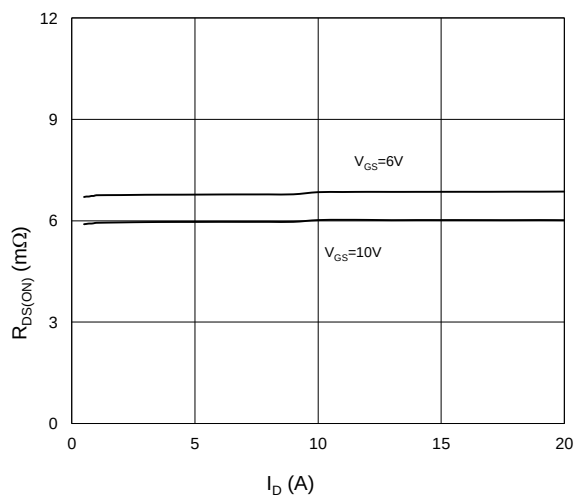


Figure 4. Normalized On-Resistance vs. Junction Temperature

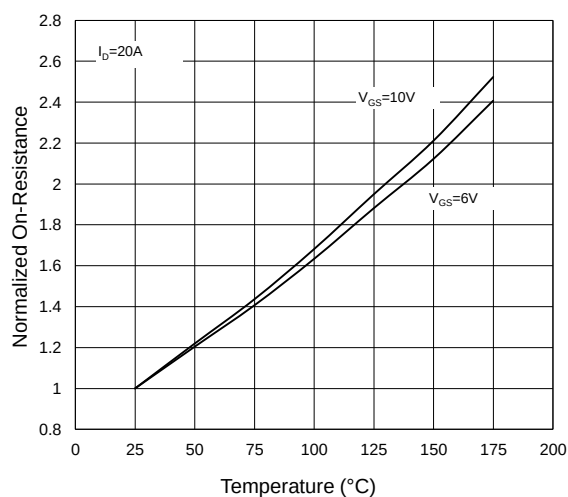


Figure 5. Typical Transfer Characteristics

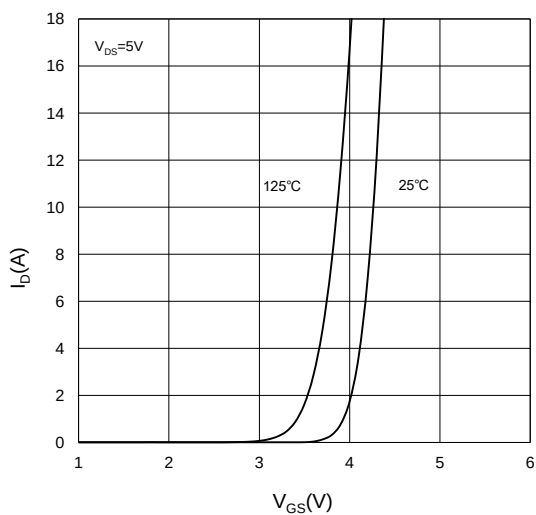


Figure 6. Typical Source-Drain Diode Forward Voltage

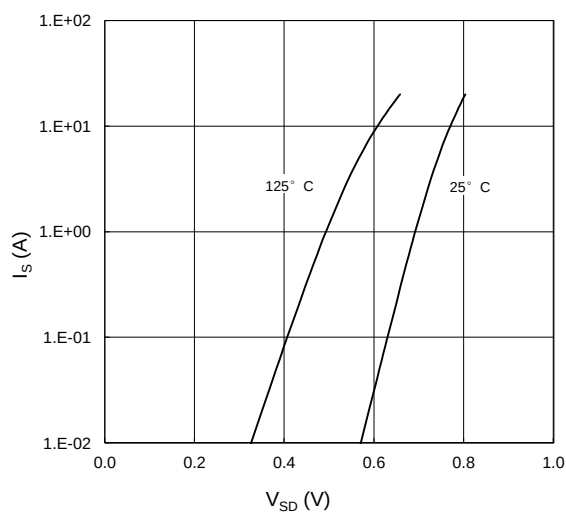


Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

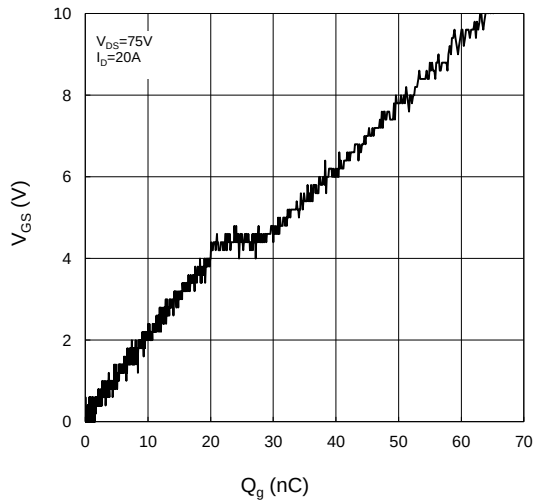


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

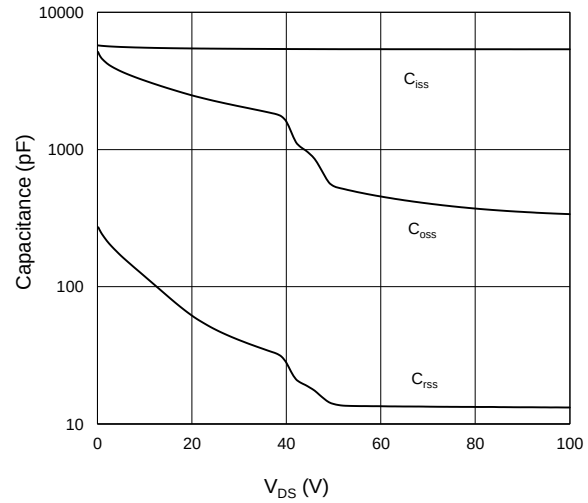


Figure 9. Maximum Safe Operating Area

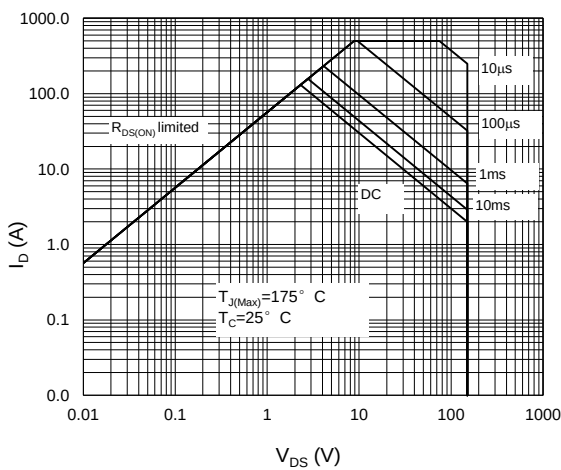


Figure 10. Maximum Drain Current vs. Case Temperature

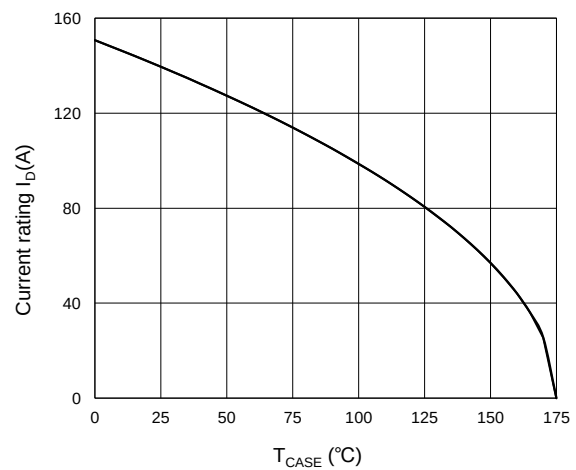
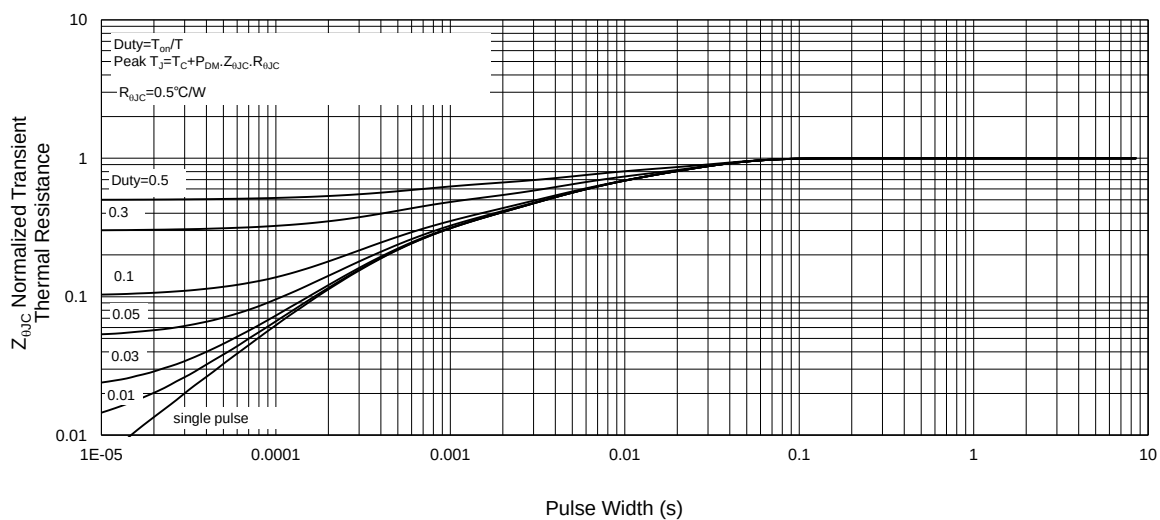
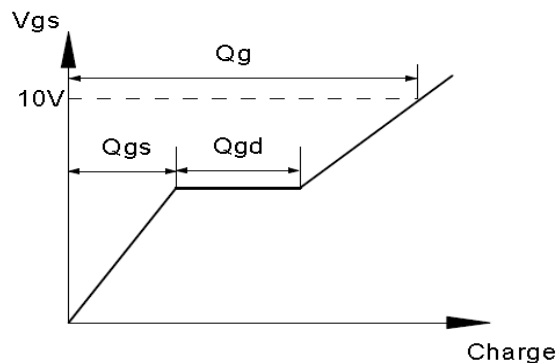
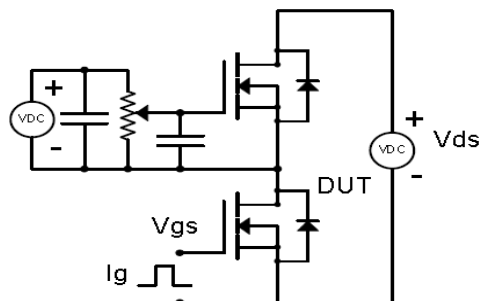
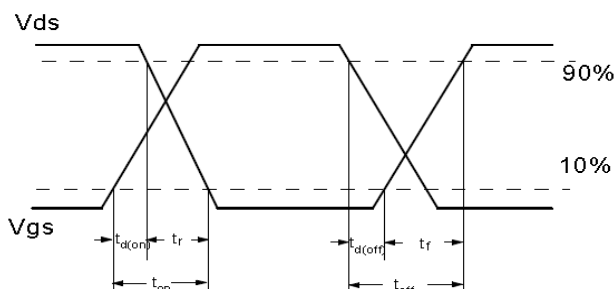
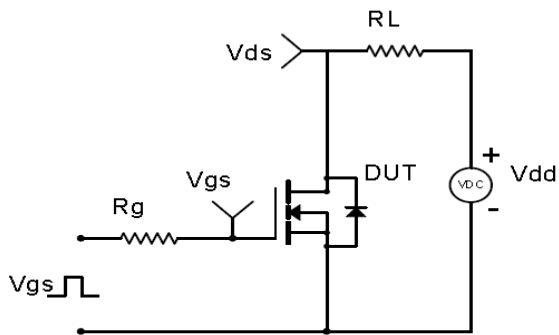
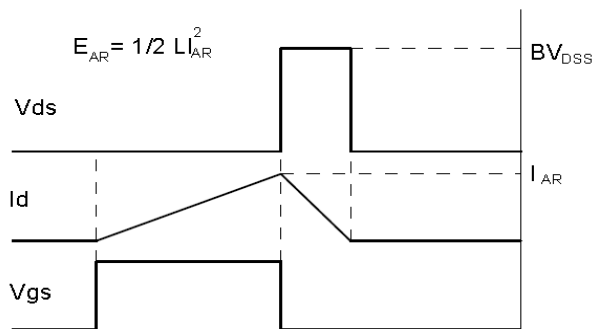
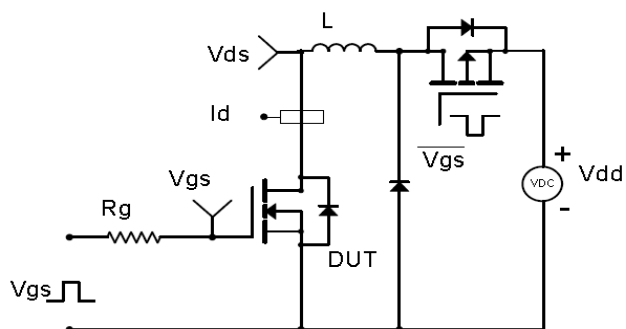
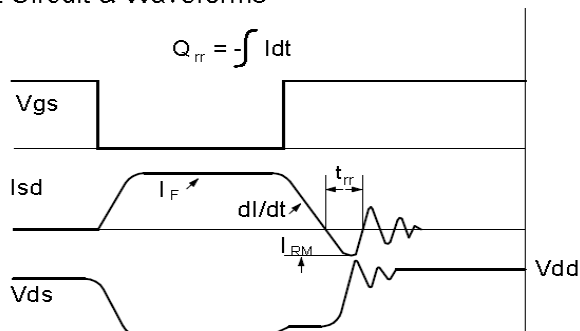
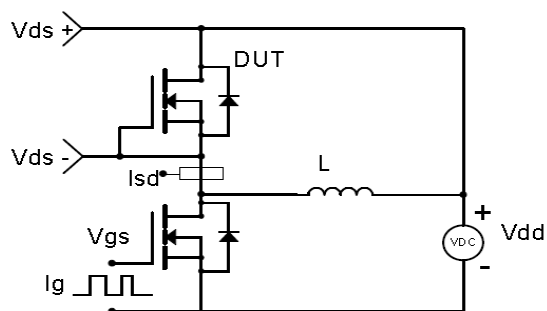
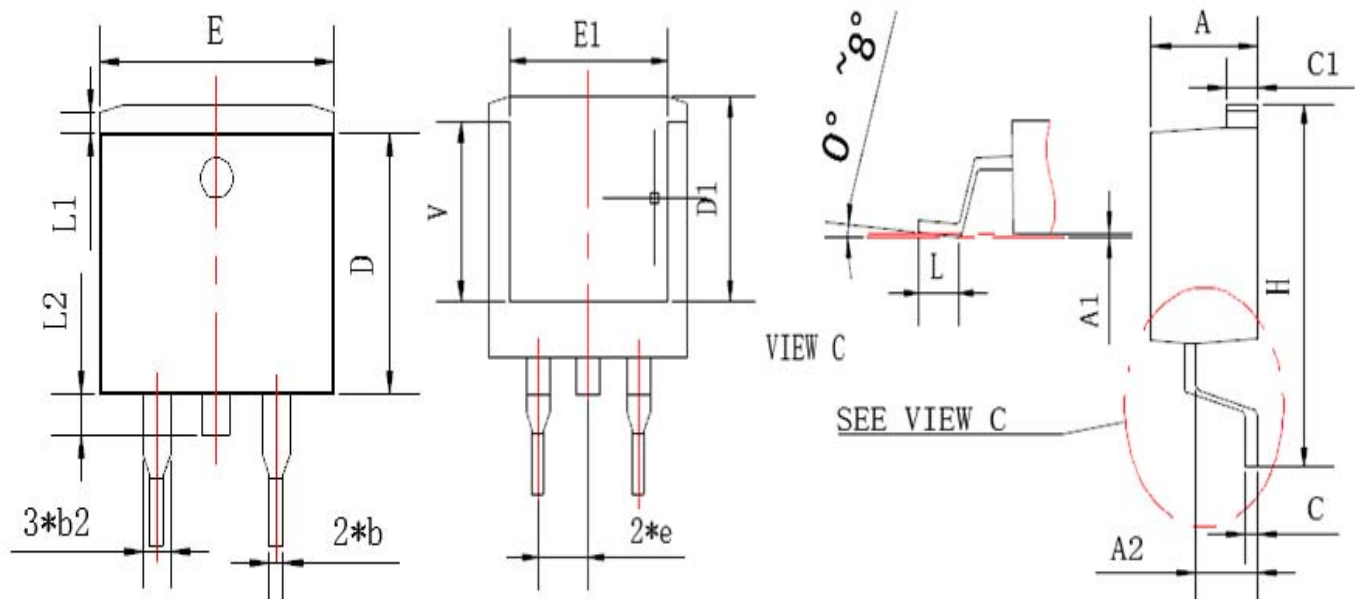


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case



Test Circuit & Waveform
Gate Charge Test Circuit & Waveform

Resistive Switching Test Circuit & Waveforms

Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

Diode Recovery Test Circuit & Waveforms


Package Outline: TO-263


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.30	4.80	0.169	0.189
A1	0.00	0.25	0.000	0.010
A2	2.35	2.70	0.093	0.106
b	0.70	0.94	0.028	0.037
b2	1.15	1.35	0.045	0.053
C	0.35	0.65	0.014	0.026
C1	1.20	1.40	0.047	0.055
D	8.40	9.40	0.331	0.370
D1	7.80	8.10	0.307	0.319
e	2.540 Typ.		0.100 Typ.	
E	9.85	10.30	0.388	0.406
E1	7.00	8.50	0.276	0.335
H	15.00	15.70	0.591	0.618
L	2.30	2.80	0.091	0.110
L1	0.90	1.30	0.035	0.051
V	6.700Ref.		0.264Ref	
L2	1.00	1.50	0.039	0.059

Revision History

Revision	Date	Major Changes
1.0	2023-3-26	Release of formal version

Disclaimer

Unless otherwise specified in the datasheet, the product is designed and qualified as a standard commercial product and is not intended for use in applications that require extraordinary levels of quality and reliability, such as automotive, aviation/aerospace and life-support devices or systems.

Any and all semiconductor products have certain probability to fail or malfunction, which may result in personal injury, death or property damage. Customer are solely responsible for providing adequate safe measures when design their systems.

Scilicon Electric reserves the right to improve product design,function and reliability without notice.