SFP035N100C3/SFB035N100C3

N-MOSFET 100V, 160A, 2.8mΩ

Features

- Uses advanced SGT technology
- Extremely low on-resistance R_{DS}(on)
- Excellent gate charge x R_{DS}(on) product(FOM)

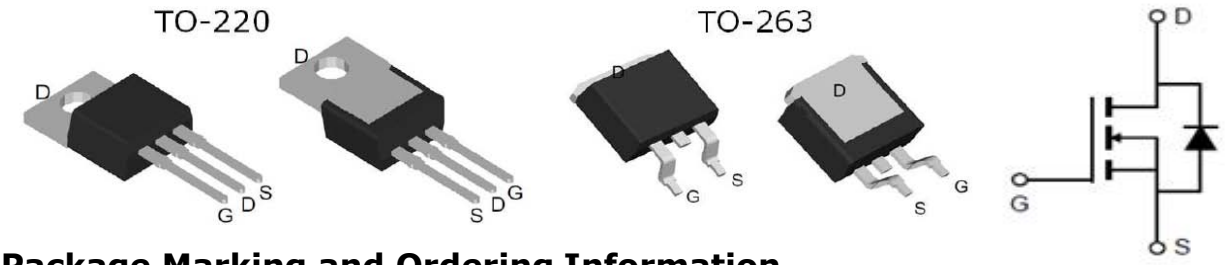
Application

- Motor control and drives
- Battery management
- DC/DC converter
- General purpose applications

Product Summary

V_{DS}	100V
$R_{DS(on)@VGS=10V}$	2.8mΩ
I_D	160A

TO-220 TO-263



Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
SFP035N100C3	035N100C3	TO-220	Tube	N/A	N/A	50pcs
SFB035N100C3	035N100C3	TO-263	Reel&Tape	330×24.8mm	24mm	800pcs

Maximum Ratings

Parameter	**Symbol**	**Value**	**Unit**
Drain-source voltage	V_{DS}	100	V
Continuous drain current T_C = 25°C (Silicon limit) T_C = 100°C (Silicon limit)	I_D	 160 128	A
Pulsed drain current T_C = 25°C, t_p limited by T_{jmax}	$I_{D\ pulse}$	640	
Avalanche energy, single pulse (L=0.3mH,Rg=25Ω)(1)	E_{AS}	600	mJ
Gate-Source voltage	V_{GS}	±20	V
Power dissipation T_C = 25°C	P_D	183	W
Operating junction and storage temperature	T_j , T_{stg}	-55~150	℃

Notes:

(1) V_{DS}=50V,V_{GS}=10V,L=0.3mH.

Thermal Resistance

	Symbol	Value	Unit
Thermal resistance, junction – case. Max	R_{thJC}	0.75	℃/W

Electrical Characteristic, at Tj = 25 °C, unless otherwise specified

Parameter	Symbol	Test Condition	Value			Unit
			min.	typ.	max.	
Static Characteristic						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250uA	100	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA T_j=25°C	2.4	3	3.6	
Zero gate voltage drain current	I_{DSS}	V_{DS}=100V,V_{GS}=0 V T_j=25°C	-	-	1	μA
Gate-source leakage current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=50A, T_j=25°C	-	2.8	3.5	mΩ
Transconductance	g_{fs}	V_{DS}=5V,I_D=50A	-	100	-	S
Dynamic Characteristic						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=50V, f=1MHz	-	7040	-	pF
Output Capacitance	C_{oss}		-	1010	-	
Reverse Transfer Capacitance	C_{rss}		-	35	-	
Gate Total Charge	Q_G	V_{GS}=10V, V_{DS}=50V, I_D=50A	-	122	-	nC
Gate-Source charge	Q_{gs}		-	28	-	
Gate-Drain charge	Q_{gd}		-	36	-	
Turn-on delay time	$t_{d(on)}$	V_{GS}=10V,V_{DS}=50V, R_G=3Ω	-	48	-	ns
Rise time	t_r		-	56	-	
Turn-off delay time	$t_{d(off)}$		-	75	-	
Fall time	t_f		-	33	-	
Gate resistance	R_G	V_{GS}=0V, V_{DS}=0V, f=1MHz	-	1	-	Ω

Body Diode Characteristic

Body Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_{SD}=50A	-	0.9	1.1	V
Body Diode Reverse Recovery Time	t_{rr}	I_F=100A, dI/dt=100A/μs	-	115	-	ns
Body Diode Reverse Recovery Charge	Q_{rr}	I_F=100A, dI/dt=100A/μs	-	320	-	nC

Typical Performance Characteristics

Fig 1: Output Characteristics

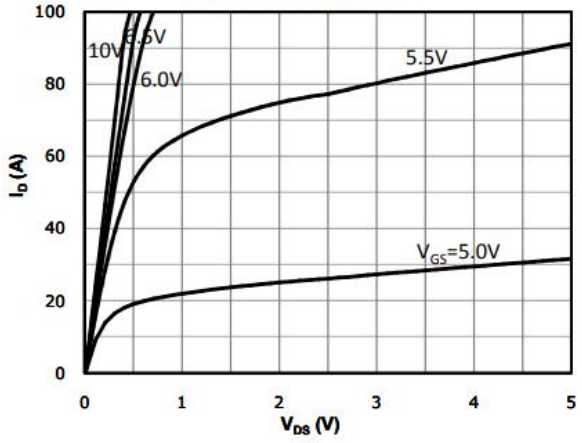


Fig 2: Transfer Characteristics

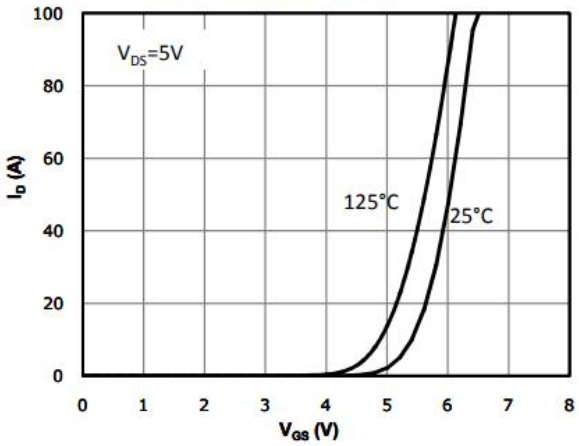


Fig 3: Rds(on) vs Drain Current and Gate Voltage

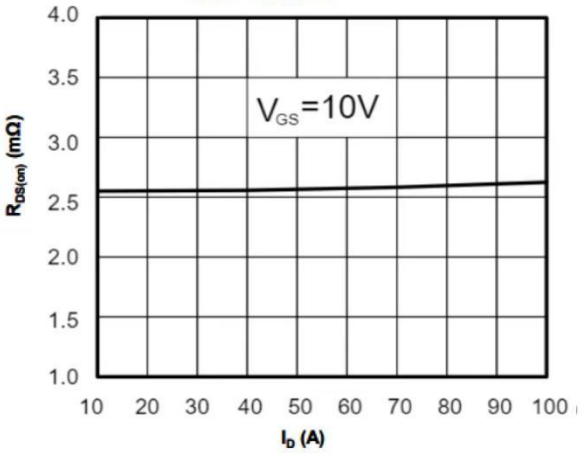


Fig 4: Rds(on) vs Gate Voltage

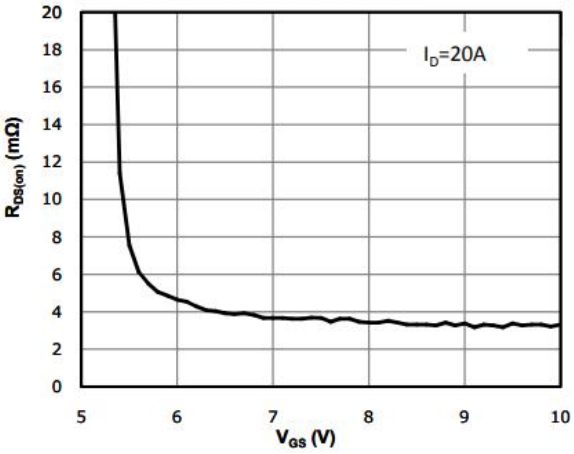


Fig 5: Rds(on) vs. Temperature

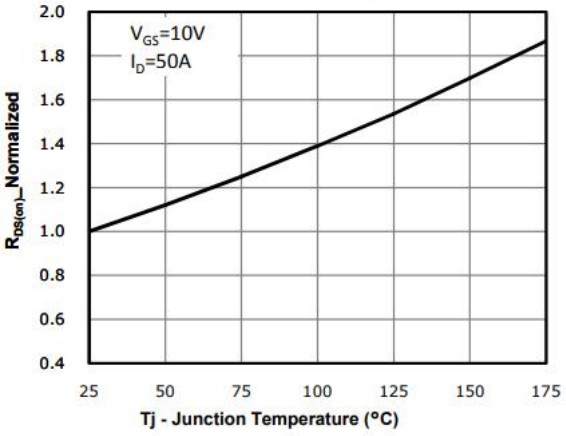


Fig 6: Capacitance Characteristics

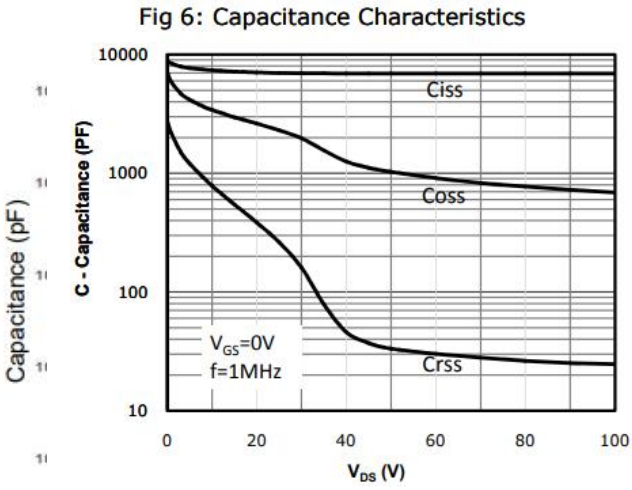


Fig 7: Gate Charge Characteristics

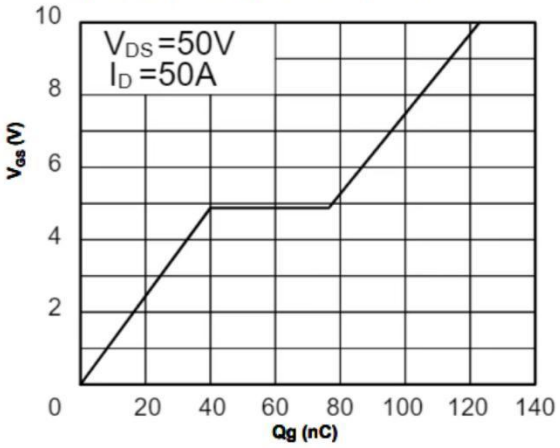


Fig 8: Body-diode Forward Characteristics

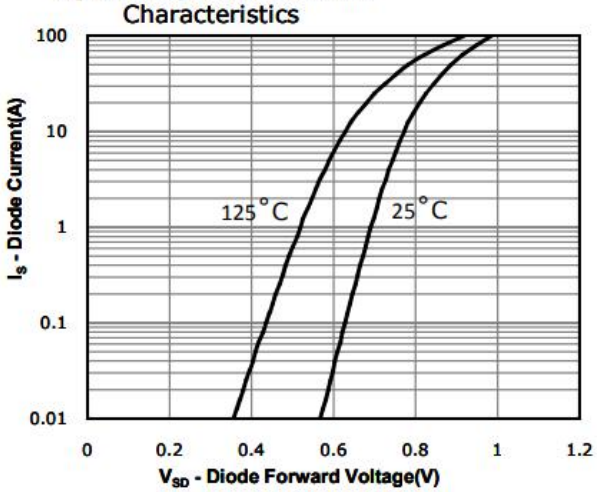


Fig 9: Power Dissipation

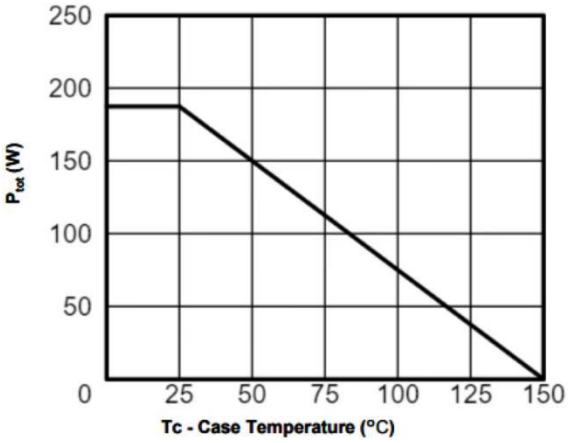


Fig 10: Drain Current Derating

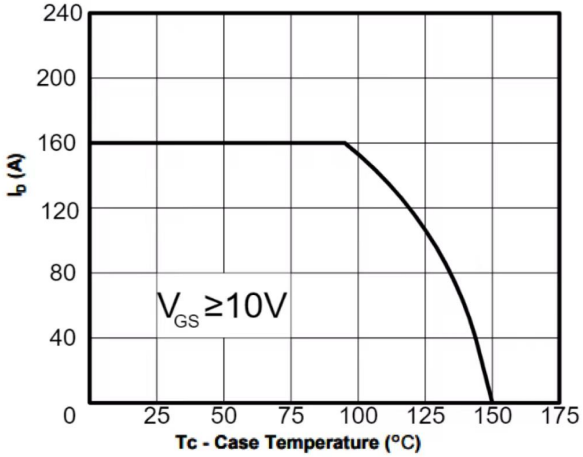


Fig 11: Safe Operating Area

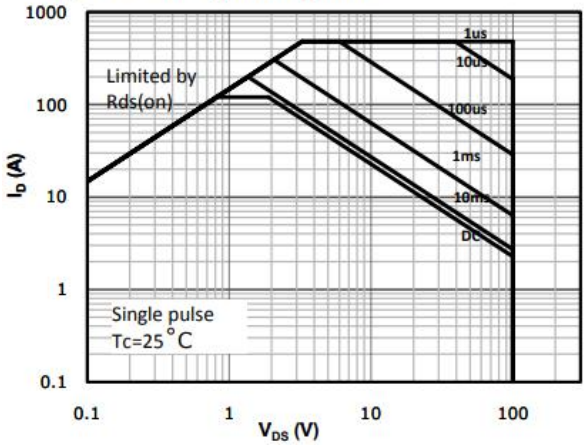
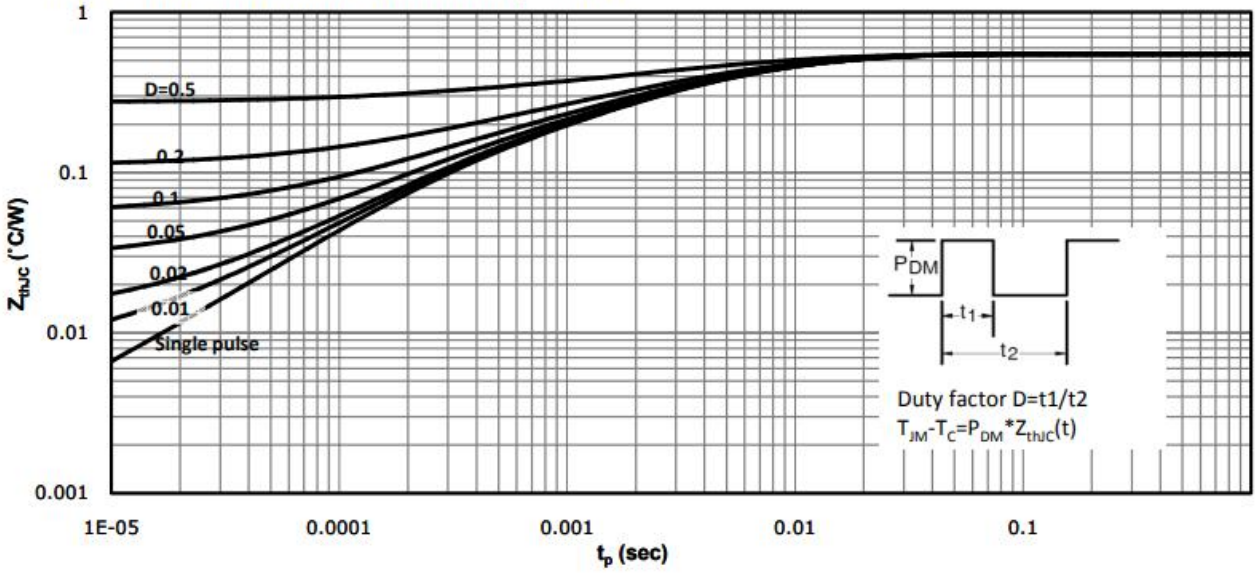
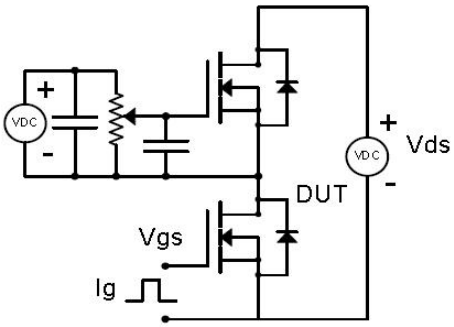


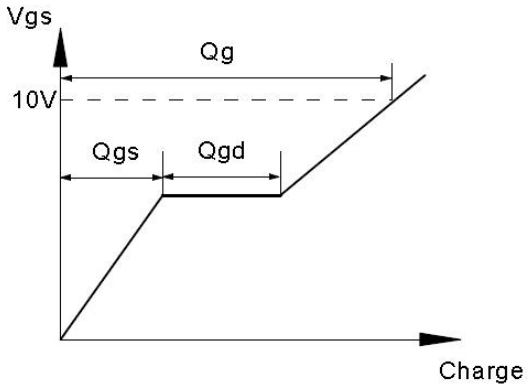
Fig 12: Max. Transient Thermal Impedance



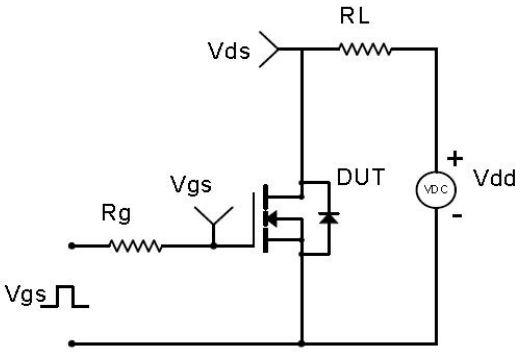
Test Circuit & Waveform

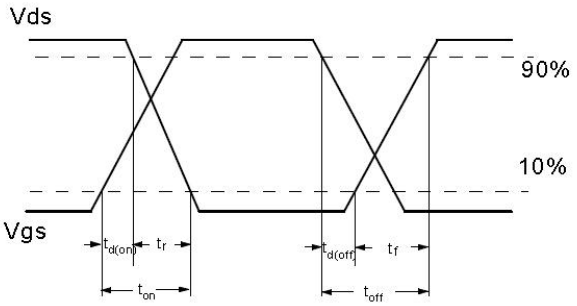
Gate Charge Test Circuit & Waveform



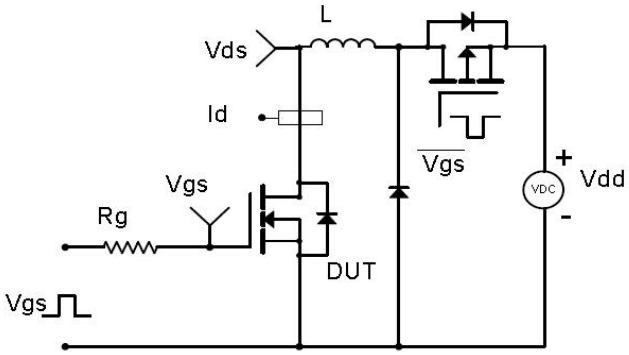


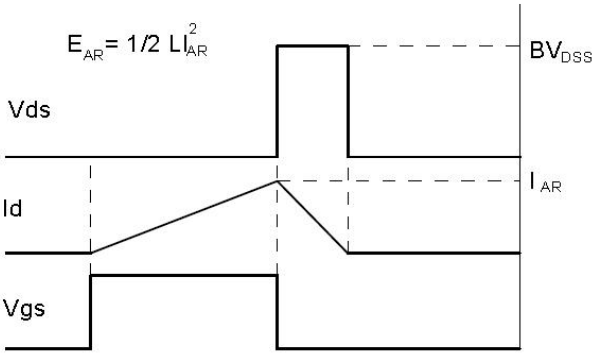
Resistive Switching Test Circuit & Waveforms



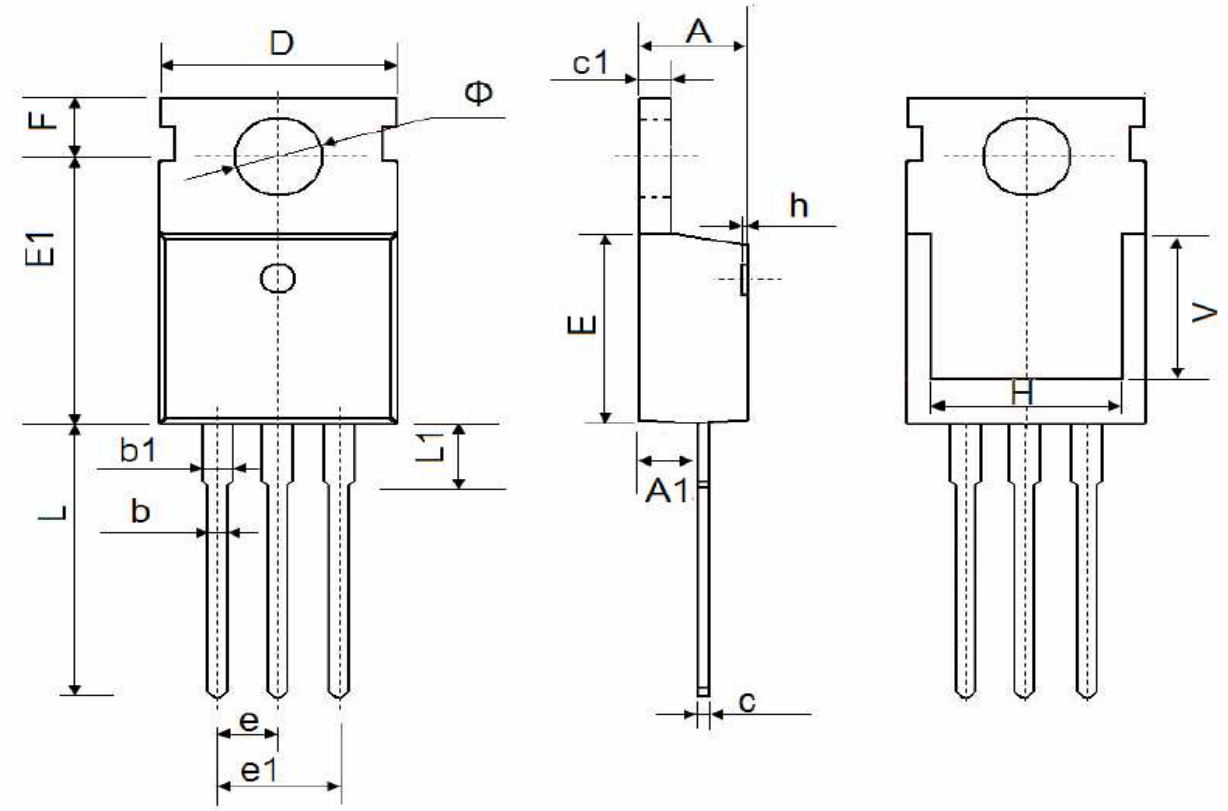


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



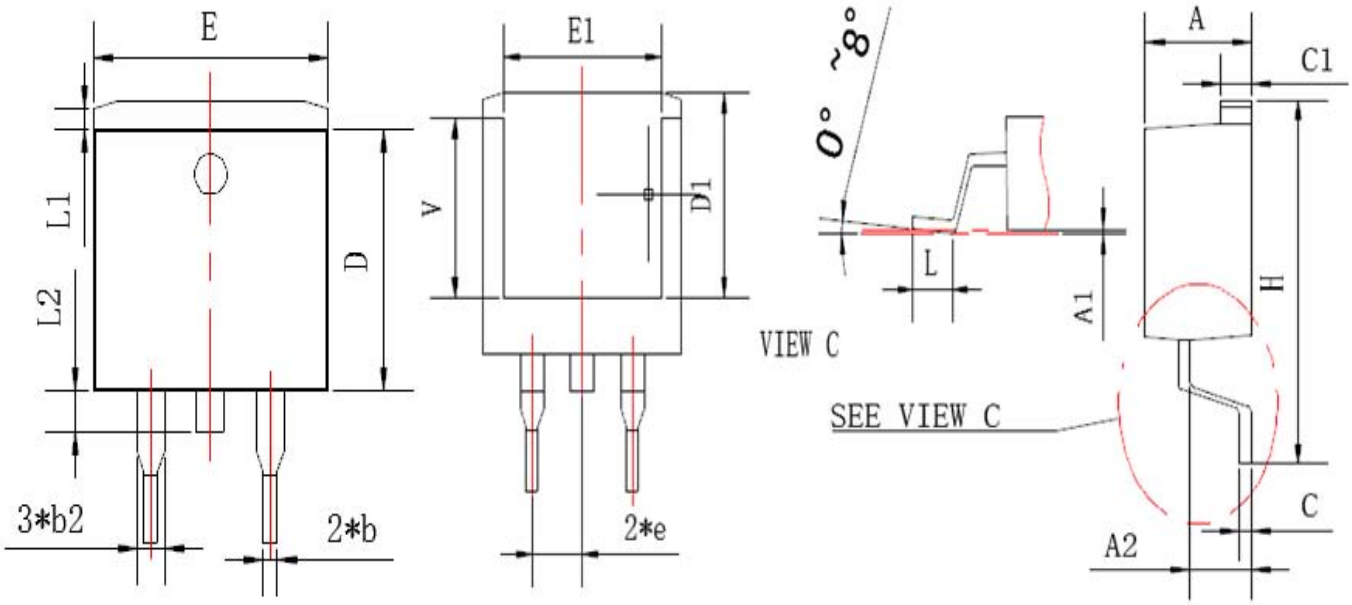


Package Outline: TO-220-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.30	4.80	0.169	0.189
A1	2.20	2.70	0.087	0.106
b	0.70	0.95	0.028	0.037
b1	1.10	1.50	0.043	0.059
c	0.40	0.65	0.016	0.026
c1	1.20	1.45	0.047	0.057
D	9.70	10.30	0.382	0.406
E	8.75	9.65	0.344	0.380
E1	12.50	13.10	0.492	0.516
e	2.540 Typ.		0.100 Typ.	
e1	4.98	5.18	0.196	0.204
F	2.60	3.00	0.102	0.118
H	7.00	8.40	0.276	0.331
h	0	0.3	0	0.012
L	12.75	13.90	0.502	0.547
L1	2.85	3.40	0.112	0.134
V	6.700Ref.		0.264Ref.	
Φ	3.50	3.80	0.138	0.150

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