SPN8878B
N-Channel Enhancement Mode MOSFET

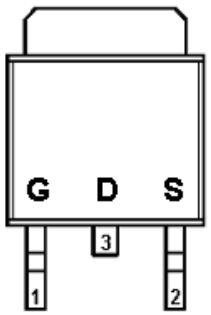
DESCRIPTION
The SPN8878B is the N-Channel logic enhancement mode power field effect transistors are produced using high cell density , DMOS trench technology. The SPN8878B has been designed specifically to improve the overall efficiency of DC/DC converters using either synchronous or conventional switching PWM controllers. It has been optimized for low gate charge, low $R_{DS(ON)}$ and fast switching speed.

APPLICATIONS
- Power Management in Note book
- Powered System
- DC/DC Converter
- Load Switch

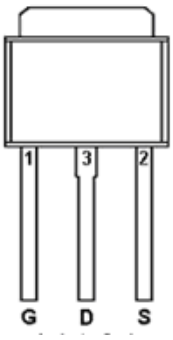
FEATURES
- 30V/20A,$R_{DS(ON)}$= 14mΩ@V_{GS}=10V
- 30V/15A,$R_{DS(ON)}$= 19mΩ@V_{GS}=4.5V
- Super high density cell design for extremely low RDS (ON)
- Exceptional on-resistance and maximum DC current capability
- TO-252 and TO-251 package design

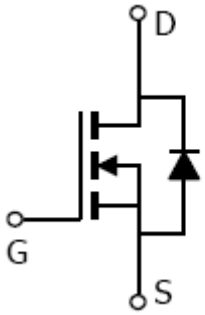
PIN CONFIGURATION

TO-252



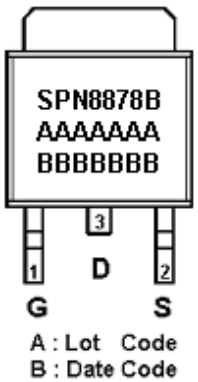
TO-251



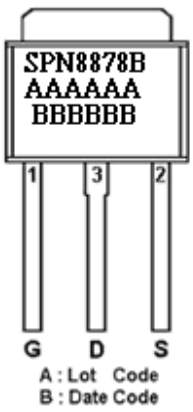


PART MARKING

TO-252



TO-251



SPN8878B
N-Channel Enhancement Mode MOSFET

PIN DESCRIPTION

Pin	Symbol	Description
1	G	Gate
2	S	Source
3	D	Drain

ORDERING INFORMATION

Part Number	Package	Part Marking
SPN8878BT252RGB	TO-252	SPN8878B
SPN8878BT251TGB	TO-251	SPN8878B

※ SPN8878BT252RGB : Tape Reel ; Pb – Free ; Halogen - Free
※ SPN8878BT251TGB : Tube ; Pb – Free ; Halogen - Free

ABSOULTE MAXIMUM RATINGS

(T_A=25℃ Unless otherwise noted)

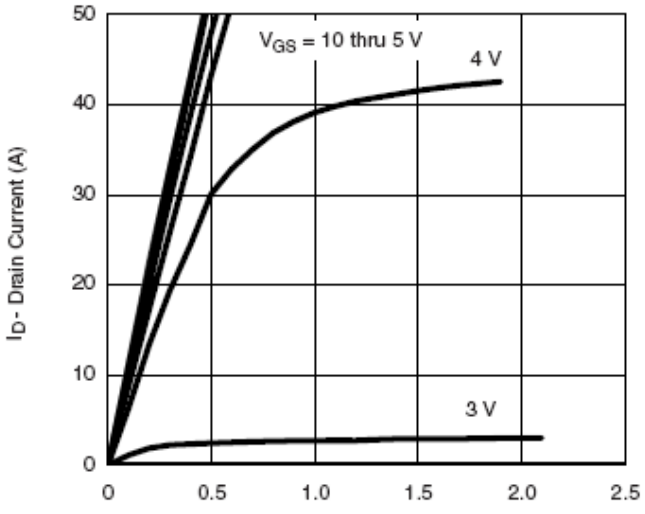
Parameter			Symbol	Typical	Unit
Drain-Source Voltage			VDSS	30	V
Gate –Source Voltage			VGSS	±20	V
Continuous Drain Current	T_A=25℃		ID	18	A
	T_A=100℃			13	
Pulsed Drain Current			IDM	40	A
Continuous Drain Current			IS	5	A
Power Dissipation	T_A=25℃	TO-252-2L	PD	40	W
		TO-251		55	
Avalanche Energy with Single Pulse (Tj=25℃, L = 0.14mH , I_{AS} = 30A , V_{DD} = 20V.)			EAS	63	mJ
Operating Junction Temperature			TJ	-55/150	℃
Storage Temperature Range			TSTG	-55/150	℃
Thermal Resistance-Junction to Ambient			RθJA	100	℃/W

ELECTRICAL CHARACTERISTICS

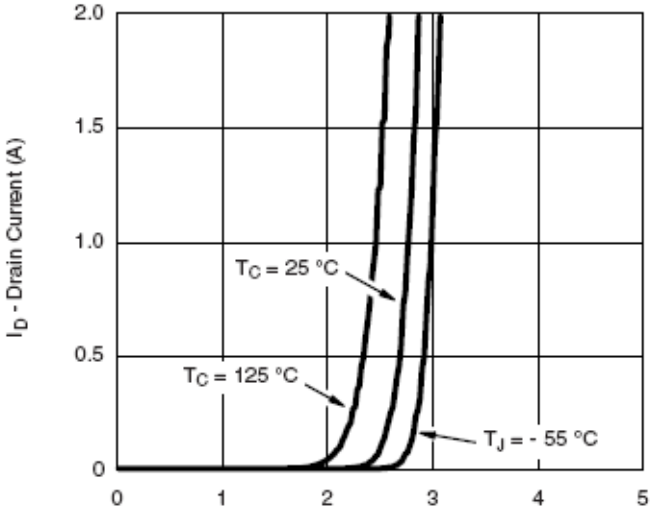
(T_A=25℃ Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=250uA	30			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	0.6		1.8	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=24V,V_{GS}=0V			1	uA
		V_{DS}=24V,V_{GS}=0V T_J=55℃			5	
On-State Drain Current	$I_{D(on)}$	V_{DS}≥5V,V_{GS} =10V	40			A
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}= 10V,I_D=20A		0.012	0.014	Ω
		V_{GS}=4.5V,I_D=15A		0.015	0.019	
Forward Transconductance	gfs	V_{DS}=15V,I_D=20A	15			S
Diode Forward Voltage	V_{SD}	I_S=40A,V_{GS} =0V		0.8	1.5	V
Dynamic						
Total Gate Charge	Q_g	V_{DS}=15V,V_{GS}=10V I_D= 50A		10	18	nC
Gate-Source Charge	Q_{gs}			2.8		
Gate-Drain Charge	Q_{gd}			2.0		
Input Capacitance	C_{iss}	V_{DS}=15VG_S=0V f=1MHz		850		pF
Output Capacitance	C_{oss}			158		
Reverse Transfer Capacitance	C_{rss}			120		
Turn-On Time	$t_{d(on)}$	V_{DD}=15V,R_L=0.3Ω I_D≡50A,V_{GEN}=10V R_G=1Ω		10	15	nS
	t_r			4	12	
Turn-Off Time	$t_{d(off)}$			15	30	
	t_f			10	15	

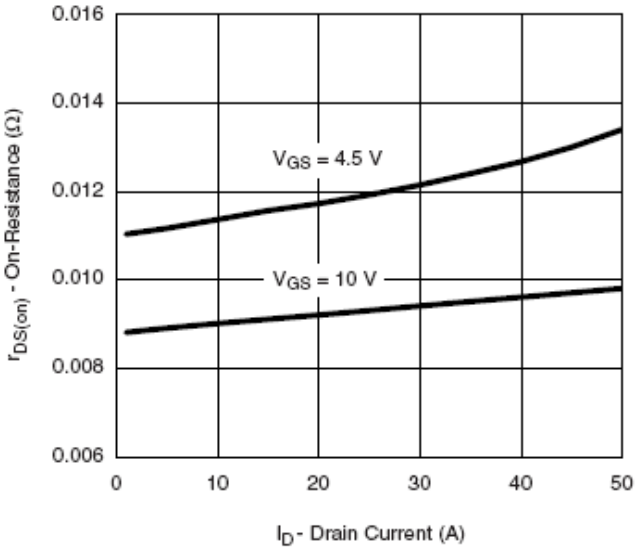
TYPICAL CHARACTERISTICS



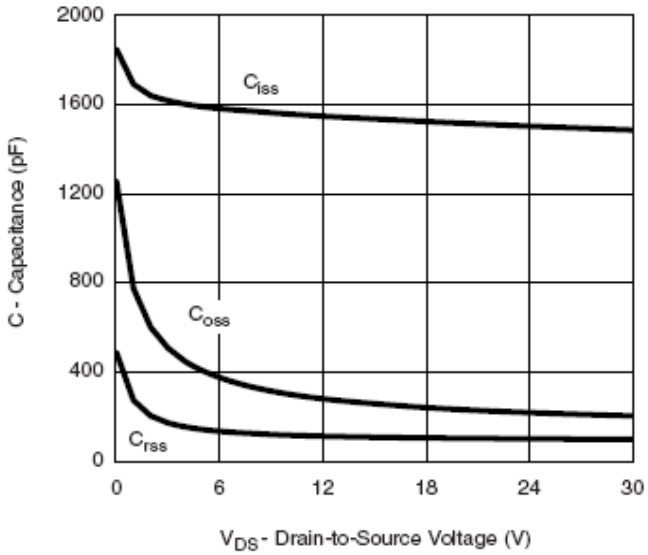
Output Characteristics



Transfer Characteristics

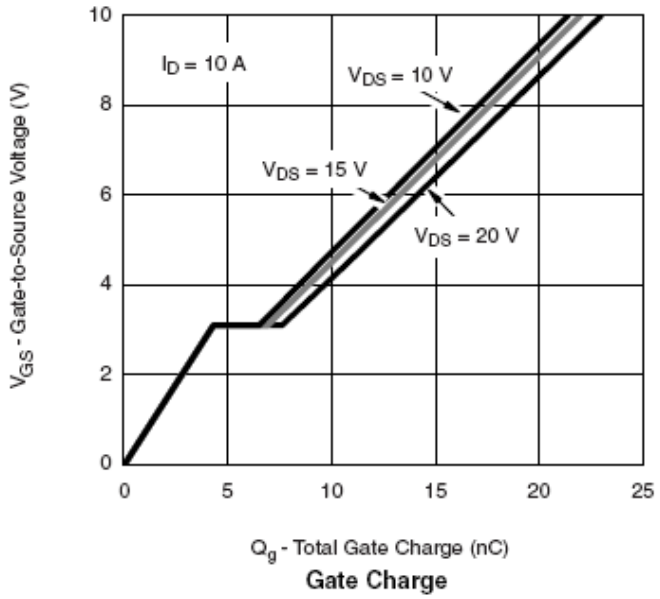


On-Resistance vs. Drain Current and Gate Voltage

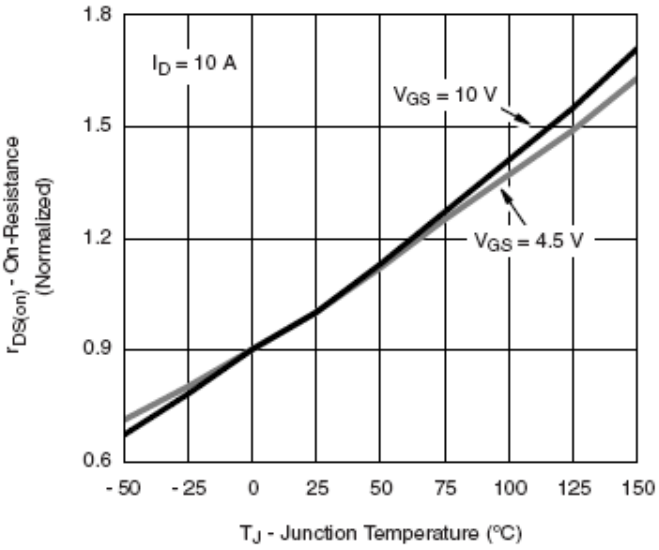


Capacitance

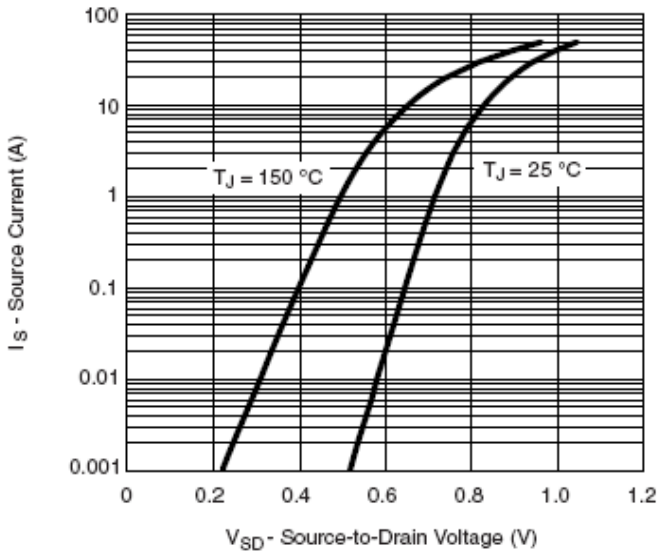
TYPICAL CHARACTERISTICS



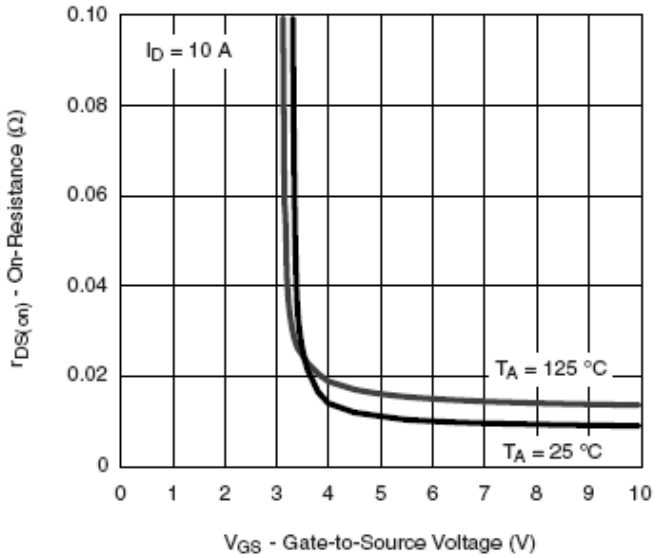
Gate Charge



On-Resistance vs. Junction Temperature

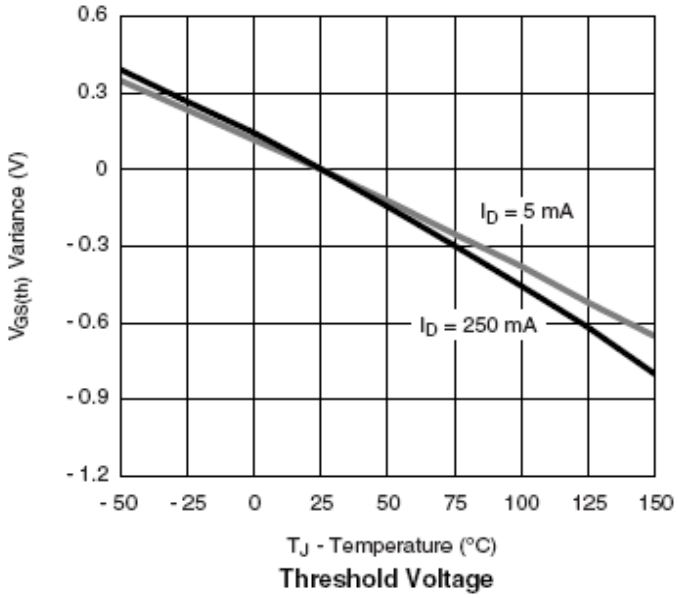


Source-Drain Diode Forward Voltage

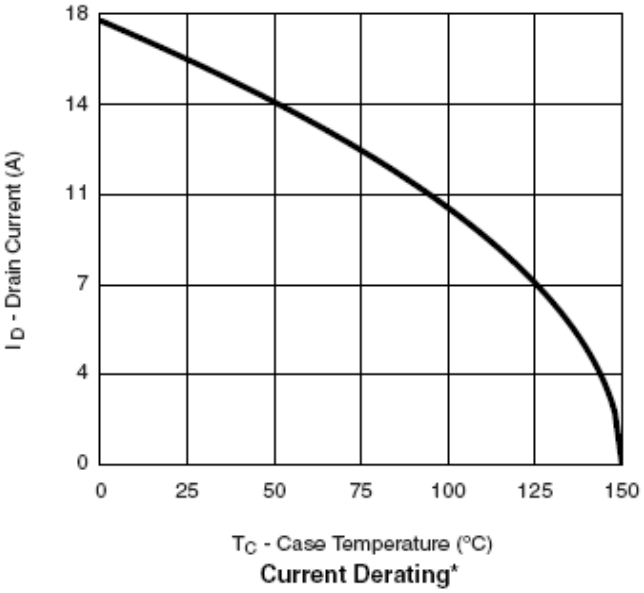


On-Resistance vs. Gate-to-Source Voltage

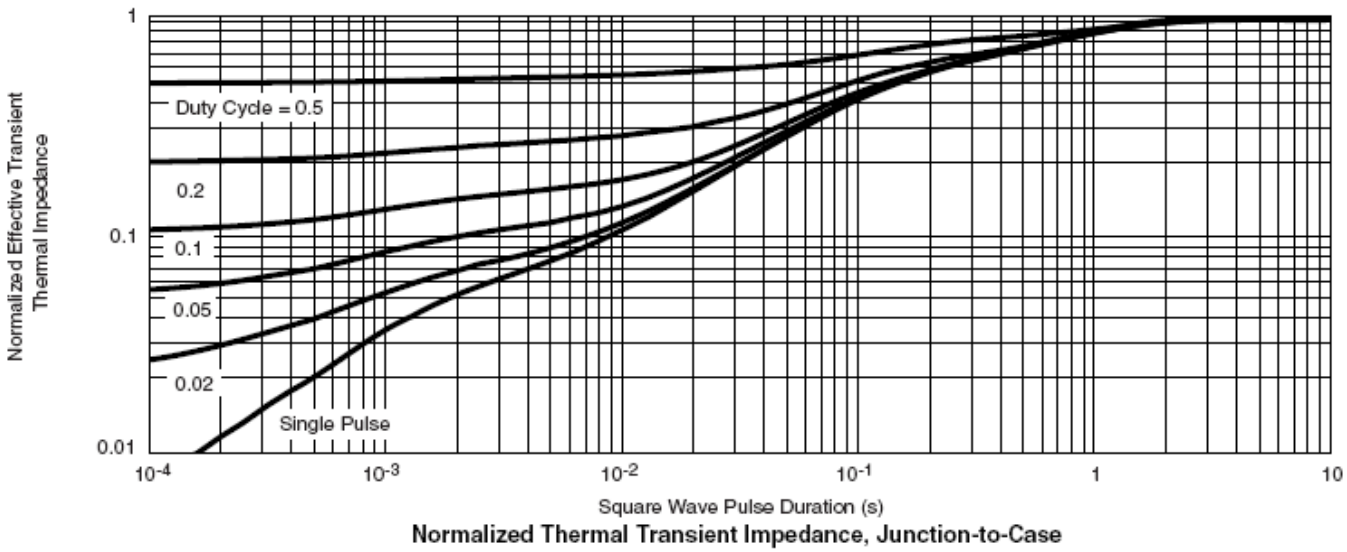
TYPICAL CHARACTERISTICS



Threshold Voltage

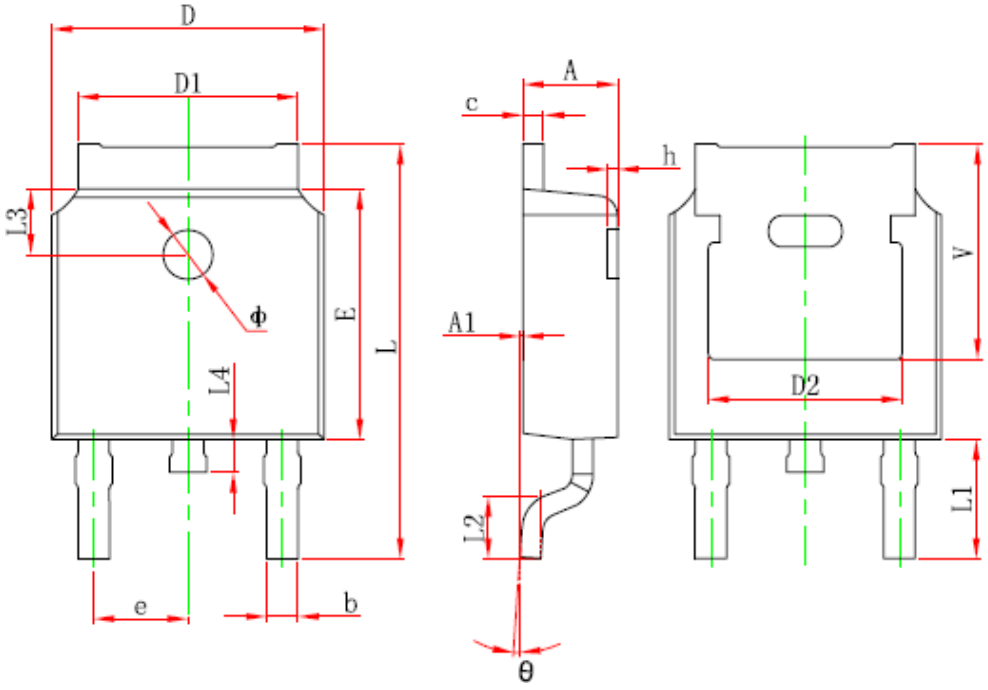


Current Derating*



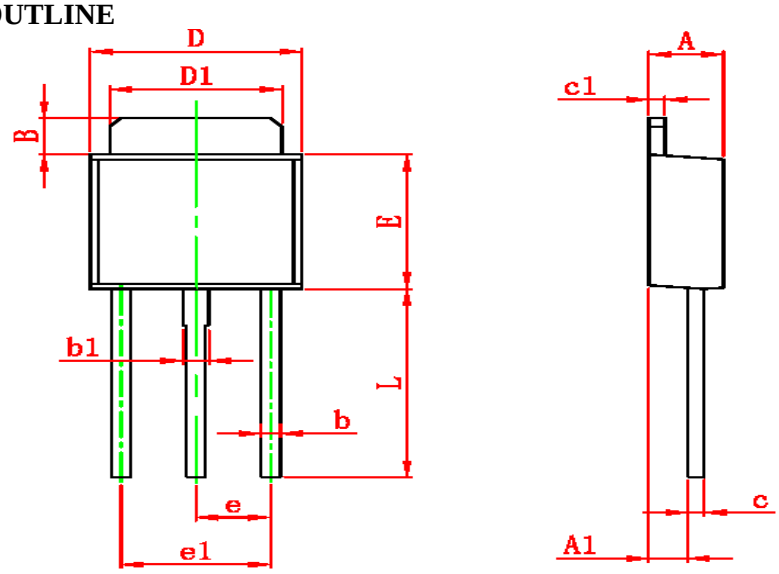
Normalized Thermal Transient Impedance, Junction-to-Case

TO-252 PACKAGE OUTLINE



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 REF.		0.211 REF.	

TO-251 PACKAGE OUTLINE



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	2.200	2.400	0.087	0.094
A1	1.020	1.270	0.040	0.050
B	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.300 TYP		0.091 TYP	
e1	4.500	4.700	0.177	0.185
L	7.500	7.900	0.295	0.311

SYNC Power Corporation
7F-2, No.3-1, Park Street
NanKang District (NKSP), Taipei, Taiwan 115
Phone: 886-2-2655-8178
Fax: 886-2-2655-8468
©http://www.syncpower.com