



SPN65T10

N-Channel Enhancement Mode MOSFET

DESCRIPTION

The SPN65T10 is the N-Channel enhancement mode power field effect transistor which is produced using high cell density DMOS trench technology. This high density process is especially tailored to minimize on-state resistance. These devices are particularly suitable for synchronous rectifier application, Motor control power management and other Power Tool circuits. It has been optimized for low gate charge, low $R_{DS(ON)}$ and fast switching speed.

FEATURES

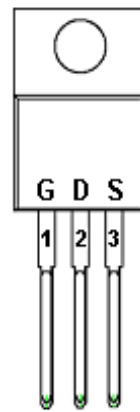
- ◆ 100V/65A, $R_{DS(ON)}=14m\Omega@V_{GS}=10V$
- ◆ Super high density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ TO-220-3L/TO-263-2L/TO-252-2L package design

APPLICATIONS

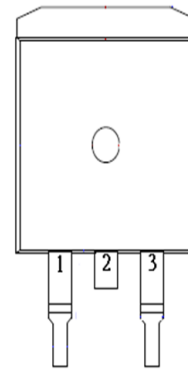
- DC/DC Converter
- Load Switch
- SMPS Secondary Side Synchronous Rectifier
- Power Tool
- Motor Control

PIN CONFIGURATION

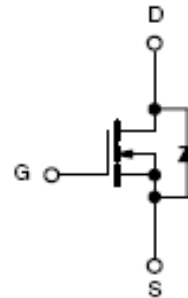
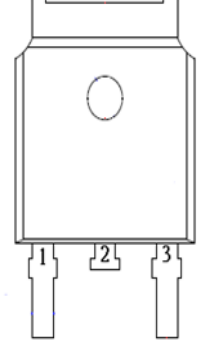
TO-220-3L



TO-263-2L



TO-252-2L



PART MARKING

TO-220-3L



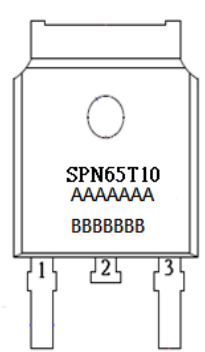
AAAAA: Wafer lot no
BBBBBB : date code

TO-263-2L



AAAAA: Wafer lot no
BBBBBB : date code

TO-252-2L



A: Lot Code
B: Date Code



SPN65T10

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PIN DESCRIPTION

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

ORDERING INFORMATION

Part Number	Package	Part Marking
SPN65T10T220TGB	TO-220-3L	SPN65T10
SPN65T10T262RGB	TO-263-2L	SPN65T10
SPN65T10T252RGB	TO-252-2L	SPN65T10

- ※ SPN65T10T220TGB : Tube ; Pb – Free ; Halogen - Free
- ※ SPN65T10T262RGB : Tape&Reel ; Pb – Free ; Halogen - Free
- ※ SPN65T10T252RGB : Tape&Reel ; Pb – Free ; Halogen - Free

ABSOLUTE MAXIMUM RATINGS

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Typical	Unit
Drain-Source Voltage	V _{DSS}	100	V
Gate –Source Voltage	V _{GSS}	±20	V
Continuous Drain Current(T _J =150°C)	I _D	TA=25°C	68
		TA=70°C	45
Pulsed Drain Current	I _{DM}	260	A
Power Dissipation@ Tc=25°C	P _D	TO-220/TO-263	104
Power Dissipation@ Tc=25°C		TO-252	93
Avalanche Energy with Single Pulse (T _j =25°C , L = 0.1mH , I _D = 23A , V _{DS} =100V.)	EAS	171	mJ
Operating Junction Temperature	T _J	-55/150	°C
Storage Temperature Range	T _{STG}	-55/150	°C
Thermal Resistance-Junction to Case (TO-220/TO-263)	R _{θJC}	1.2	°C/W
Thermal Resistance-Junction to Case (TO-252)	R _{θJC}	1.35	°C/W

Note :

The maximum current rating is package limited at 120A for TO-263-2L and TO-220-3L
The maximum current rating is package limited at 70A for TO-252-2L



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ELECTRICAL CHARACTERISTICS

(TA=25°C Unless otherwise noted)

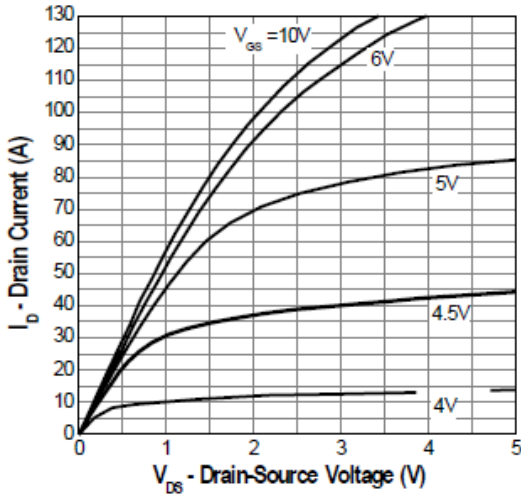
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	100			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0		4.0	
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=80V, V_{GS}=0V$			10	uA
		$V_{DS}=80V, V_{GS}=0V$ $T_J=150^\circ C$			100	
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=45A$			14	mΩ
Diode Forward Voltage	V_{SD}	$I_S=45A, V_{GS}=0V$			1.3	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=80V, V_{GS}=4.5V$ $I_D=30A$		57		nC
Gate-Source Charge	Q_{gs}			12		
Gate-Drain Charge	Q_{gd}			17.5		
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V$ $f=1MHz$		2920		pF
Output Capacitance	C_{oss}			261		
Reverse Transfer Capacitance	C_{rss}			162		
Turn-On Time	$t_{d(on)}$	$V_{DD}=50V, R_L=1.6\Omega$ $I_D=30A, V_{GEN}=10V$ $R_G=10\Omega$		15		nS
	t_r			13		
Turn-Off Time	$t_{d(off)}$			55		
	t_f			21		



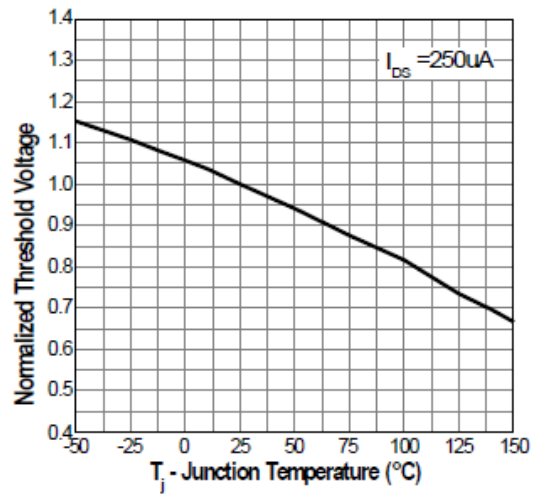
SPN65T10 N-Channel Enhancement Mode MOSFET

TYPICAL CHARACTERISTICS

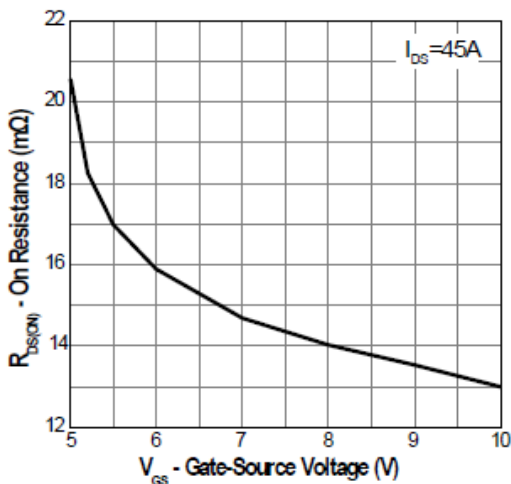
Output Characteristics



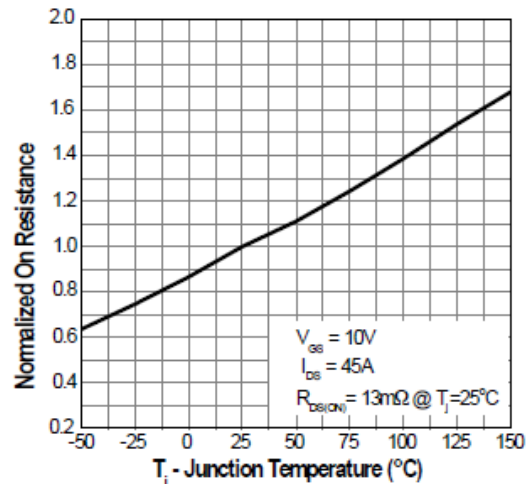
Gate Threshold Voltage vs. Temperature



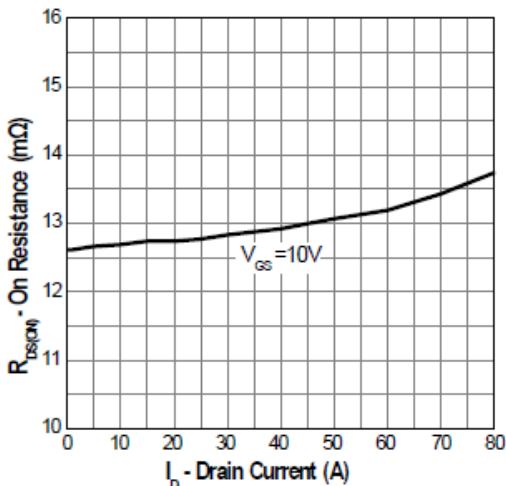
On-Resistance vs. Gate-Source Voltage



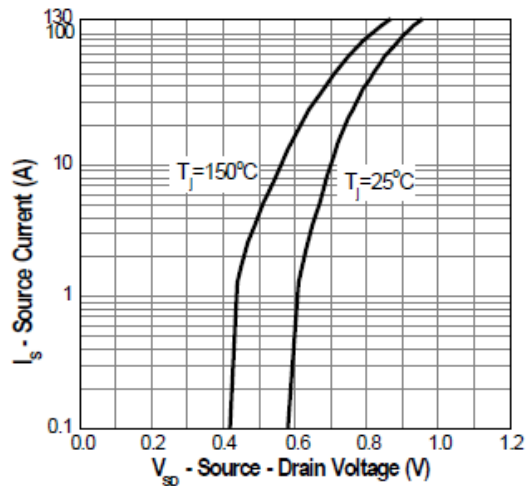
On-Resistance vs. Temperature



On-Resistance vs. Drain Current



Source-Drain Diode Forward Characteristics

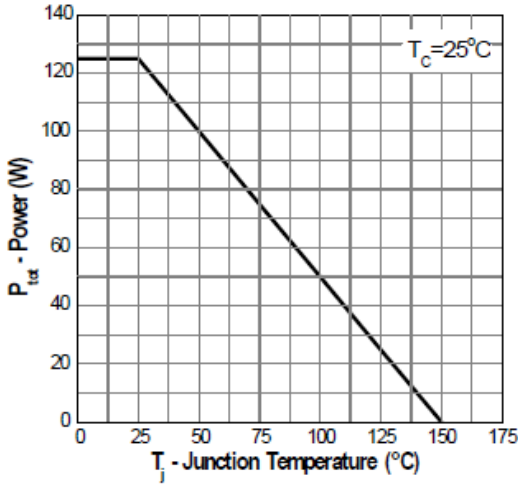




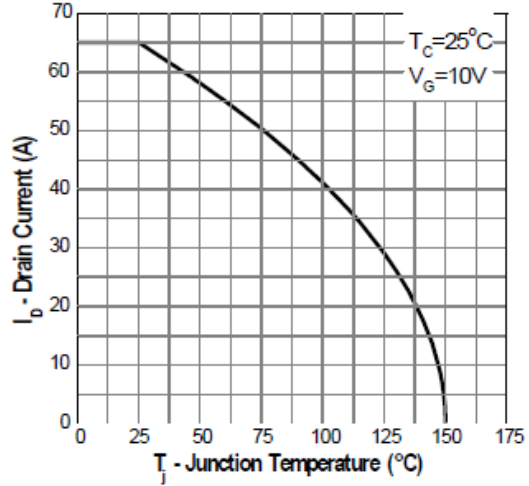
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TYPICAL CHARACTERISTICS

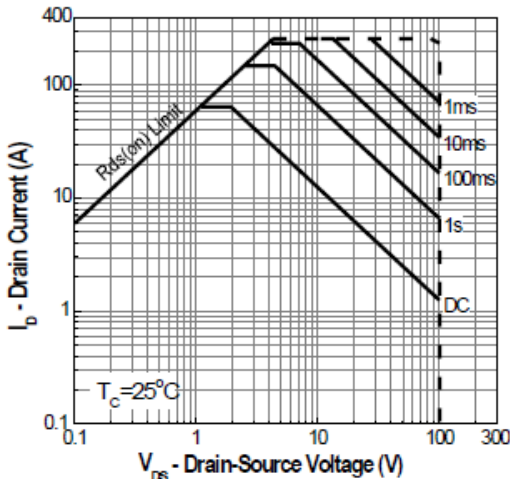
Power Dissipation



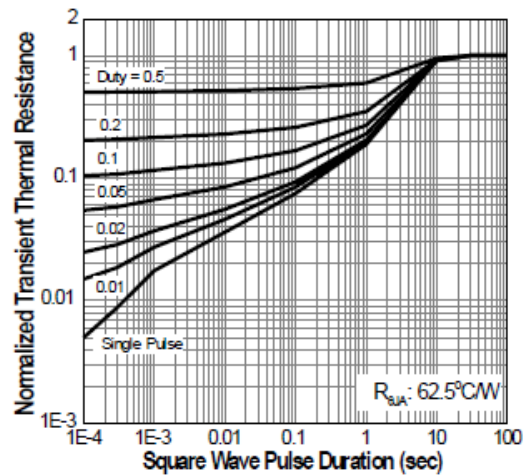
Drain Current vs. Temperature



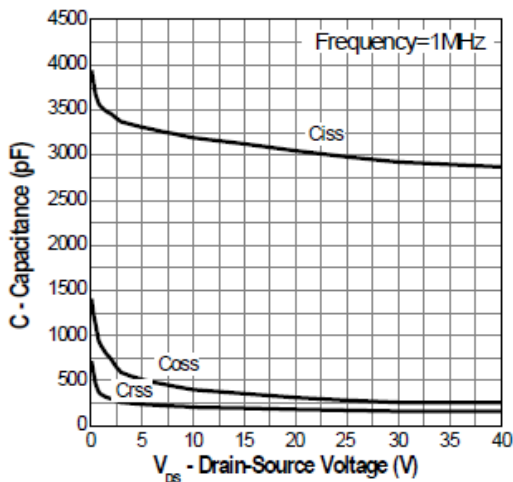
Safe Operation Area



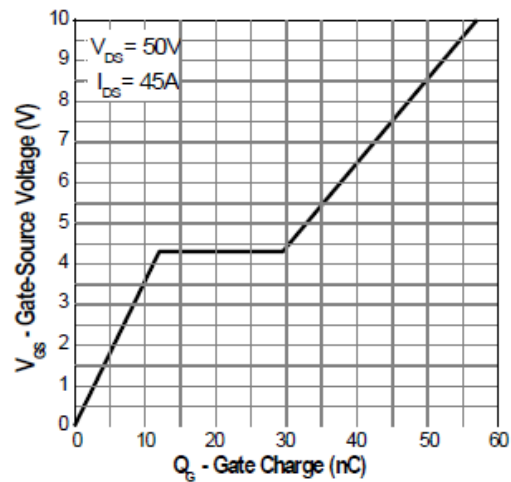
Transient Thermal Impedance



Capacitance Characteristics



Gate-Charge Characteristics

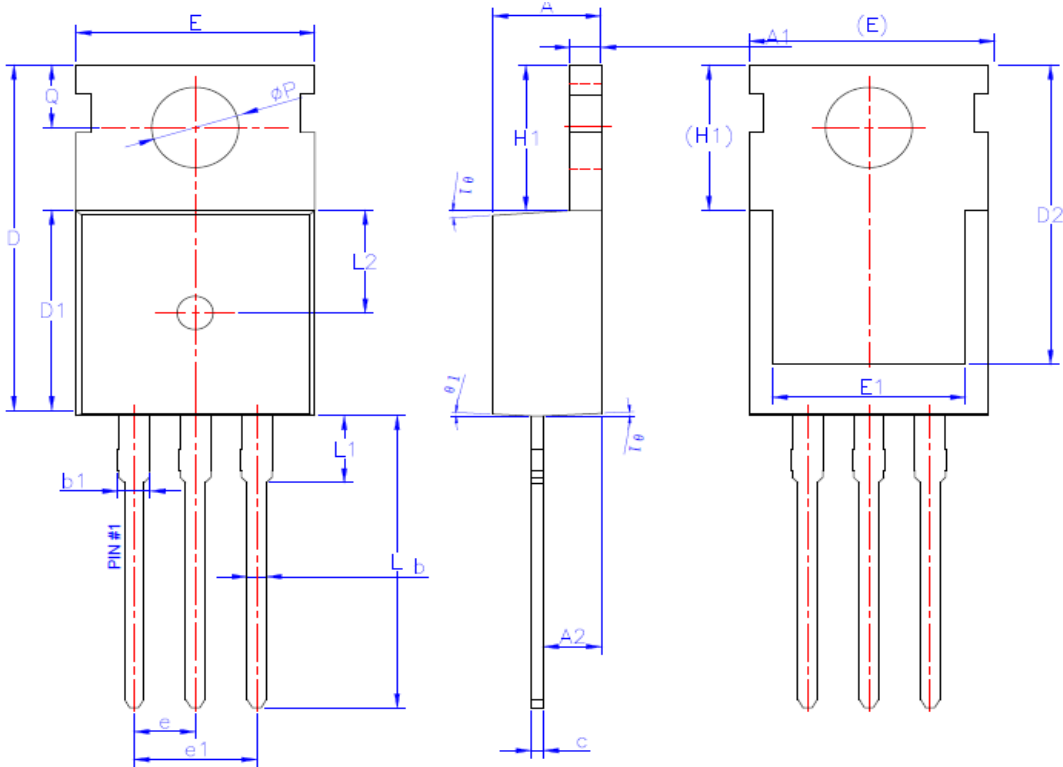




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TO-220-3L PACKAGE OUTLINE



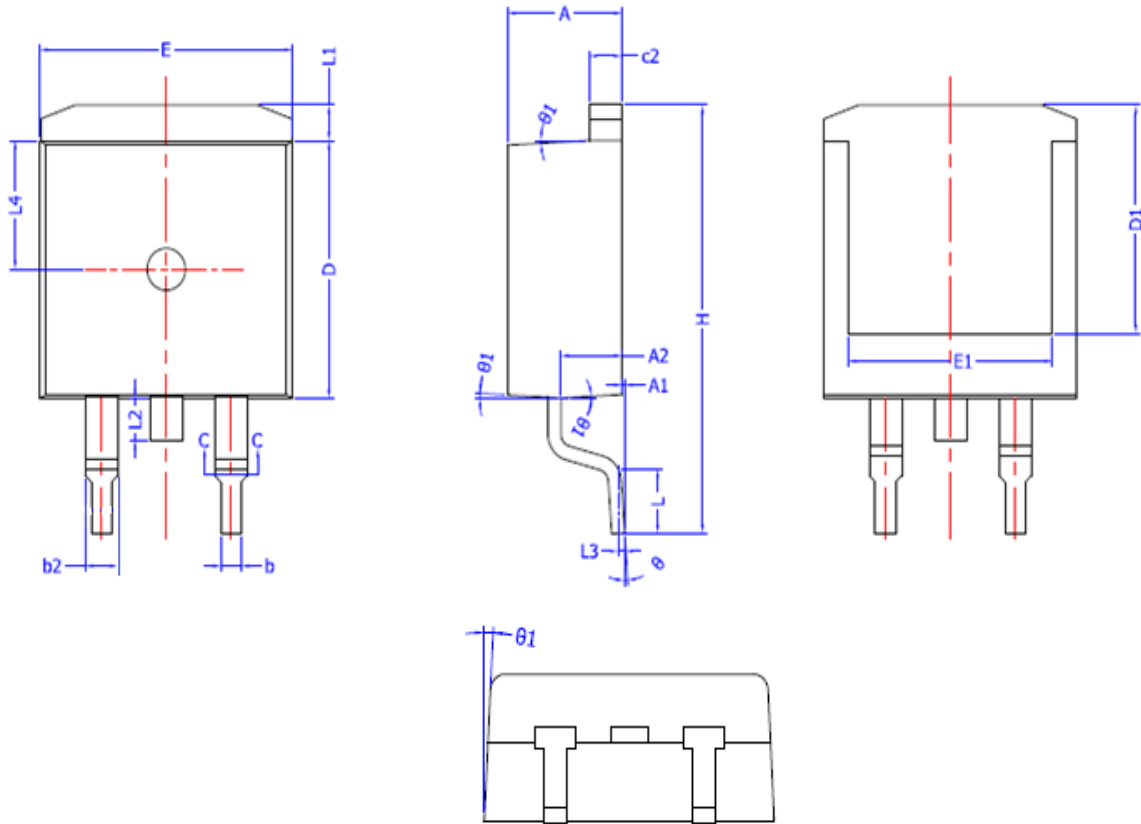
SYMBOL	MIN	NOM	MAX
A	4.40	4.50	4.60
A1	1.27	1.30	1.33
A2	2.30	2.40	2.50
b	0.70	0.60	0.90
b1	-	-	1.40
c	0.45	0.50	0.60
D	15.30	15.70	16.10
D1	9.10	9.20	9.30
D2	13.10	-	13.70
E	9.70	9.90	10.20
E1	7.80	8.00	8.20
e	2.54BSC		
e1	5.08BSC		
H1	6.30	6.50	6.70
L	12.78	13.08	13.38
L1	-	-	3.50
L2	4.6REF		
ϕP	3.55	3.60	3.65
Q	2.73	-	2.87
$\theta 1$	1°	3°	5°



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TO-263-2L PACKAGE OUTLINE



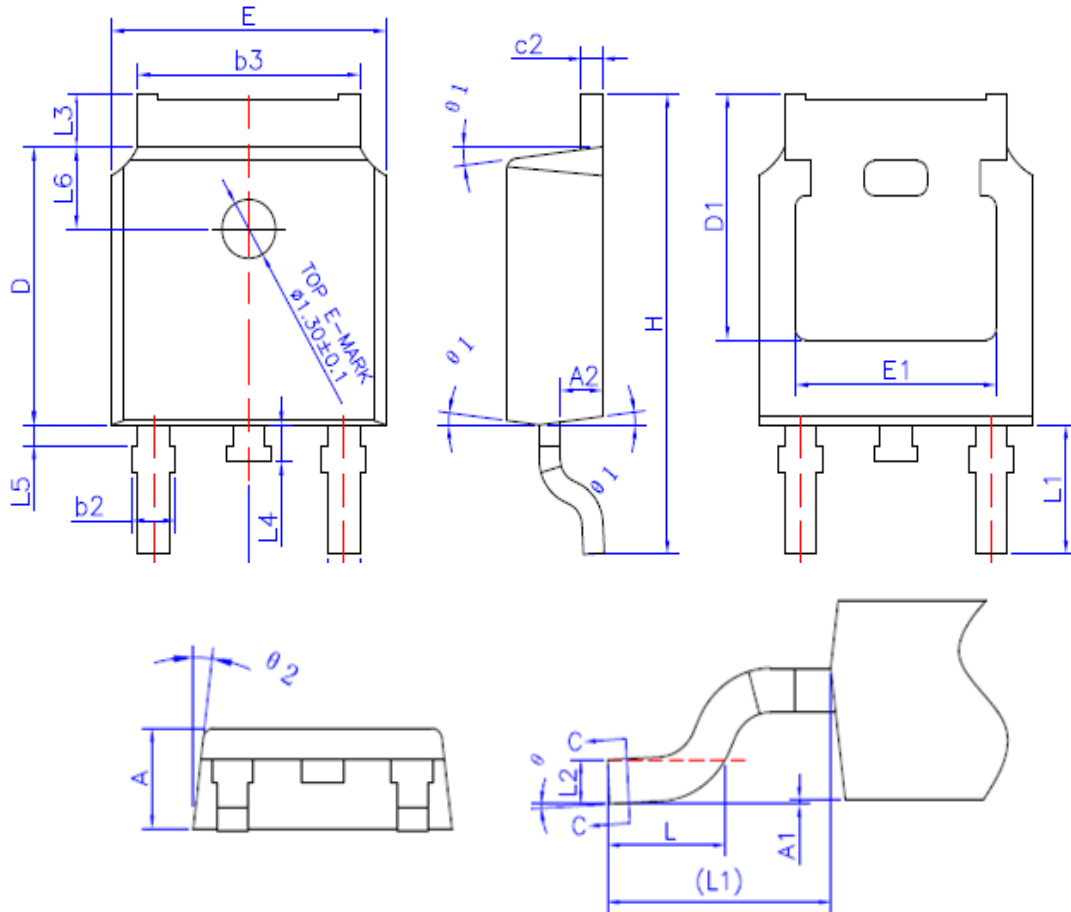
SYMBOL	MIN	NOM	MAX
A	4.40	4.50	4.60
A1	0.00	0.10	0.25
A2	2.20	2.40	2.60
b	0.71	-	0.91
b2	1.17	--	1.37
c	0.47	--	0.60
c2	1.25	1.30	1.35
D	9.10	9.20	9.30
D1	8.00	--	--
E	9.80	9.90	10.00
E1	7.80	--	--
e	2.54BSC		
H	14.90	15.30	15.70
L	2.00	2.30	2.60
L1	1.12	1.27	1.42
L2	--	--	1.75
L3	0.25BSC		
L4	4.60 REF		
θ	0°	--	8°
$\theta 1$	1°	3°	5°



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TO-252-2L PACKAGE OUTLINE



SYMBOL	MIN	NOM	MAX
A	2.20	2.30	2.40
A1	0.00	--	0.15
A2	0.90	1.01	1.10
b	0.72	-	0.85
b2	0.72	--	0.90
b3	5.13	5.33	5.46
c	0.47	--	0.60
c2	0.47	--	0.60
D	6.00	6.10	6.20
D1	5.25	--	--
E	6.40	6.60	6.80
E1	4.70	--	--
e	2.3REF		
H	9.80	10.10	10.40
L	1.40	1.60	1.80
L1	2.90REF		
L2	0.508BSC		
L3	0.90	--	1.25
L4	0.60	0.80	1.00
L5	0.15	--	0.75
L6	1.80REF		
θ	0°	3°	8°
$\theta 1$	5°	7°	9°
$\theta 2$	5°	7°	9°



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