



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

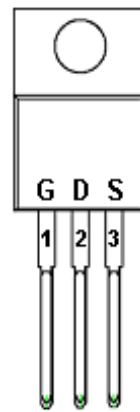
- ◆ 100V/65A, $R_{DS(ON)}=14m\Omega@V_{GS}=10V$
- ◆ Super high density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ TO-220-3L/TO-263-2L/TO-252-2L package design

APPLICATIONS

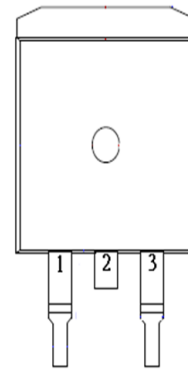
- DC/DC Converter
- Load Switch
- SMPS Secondary Side Synchronous Rectifier
- Power Tool
- Motor Control

PIN CONFIGURATION

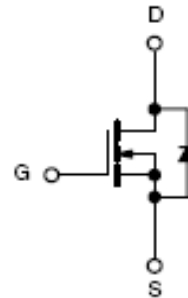
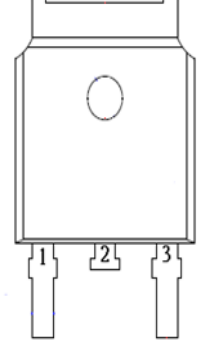
TO-220-3L



TO-263-2L



TO-252-2L



PART MARKING

TO-220-3L



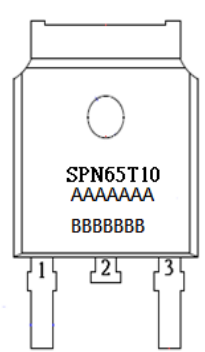
AAAAA: Wafer lot no
BBBBBB : date code

TO-263-2L



AAAAA: Wafer lot no
BBBBBB : date code

TO-252-2L



A: Lot Code
B: Date Code



SPN65T10

N-Channel Enhancement Mode MOSFET

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	A
		TA=70°C	45	
Pulsed Drain Current	I _{DM}	260	A	
Power Dissipation@ Tc=25°C	P _D	TO-220/TO-263	104	W
Power Dissipation@ Tc=25°C		TO-252	93	
Avalanche Energy with Single Pulse (T _J =25°C , L = 1mH , I _{AS} = 22A , V _{DS} =100V.)	E _{AS}	240	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



SPN65T10

N-Channel Enhancement Mode MOSFET

ELECTRICAL CHARACTERISTICS

(TA=25°C Unless otherwise noted)

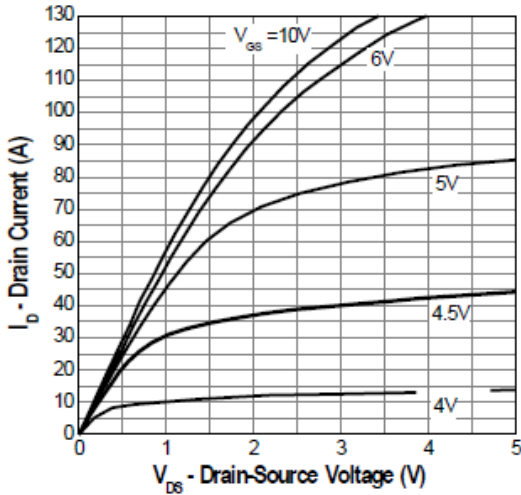
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	100			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0		4.0	
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage 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		



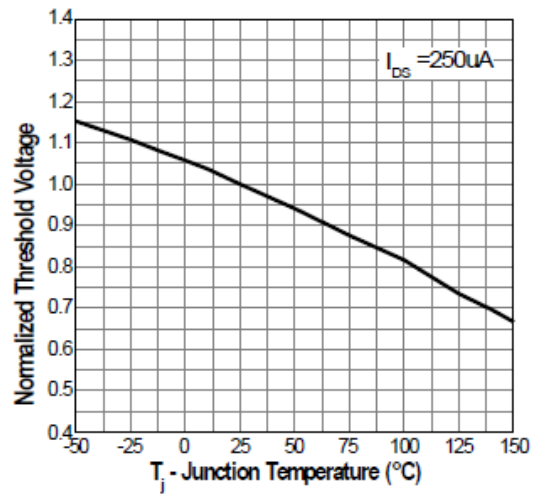
SPN65T10 N-Channel Enhancement Mode MOSFET

TYPICAL CHARACTERISTICS

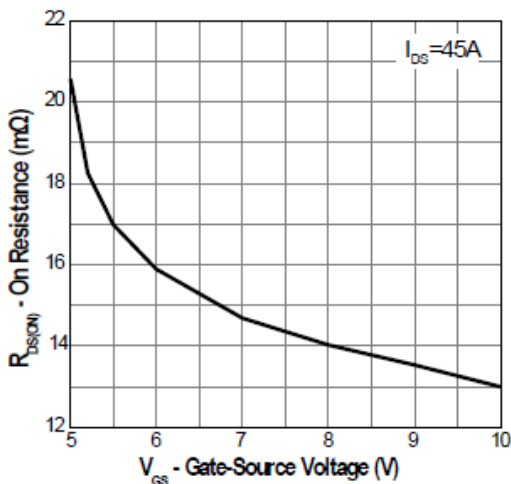
Output Characteristics



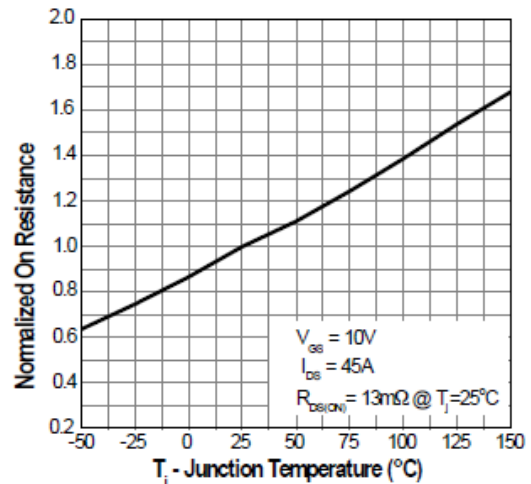
Gate Threshold Voltage vs. Temperature



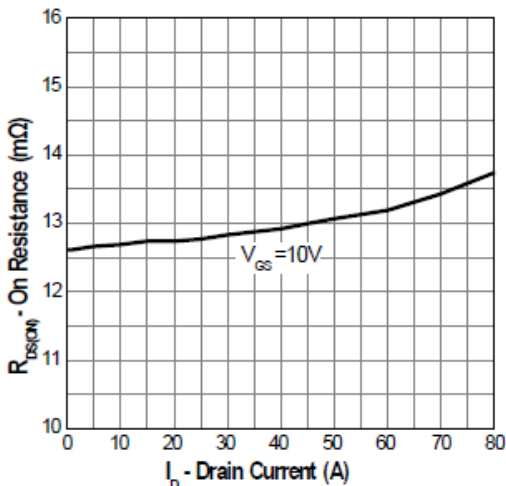
On-Resistance vs. Gate-Source Voltage



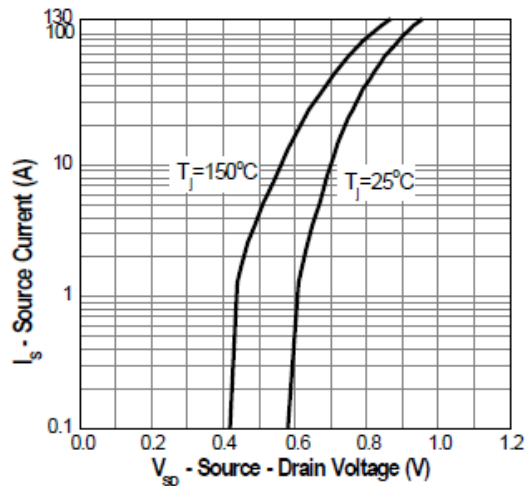
On-Resistance vs. Temperature



On-Resistance vs. Drain Current



Source-Drain Diode Forward Characteristics

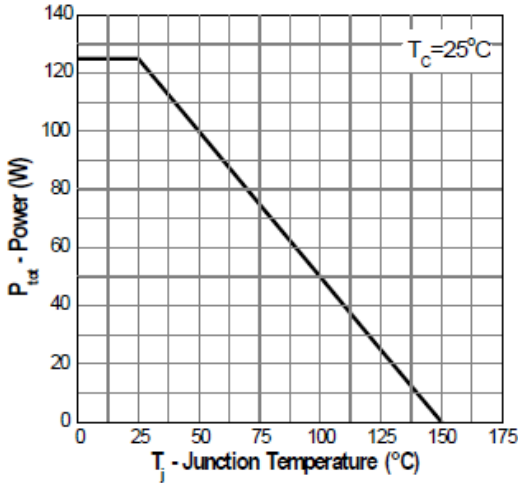




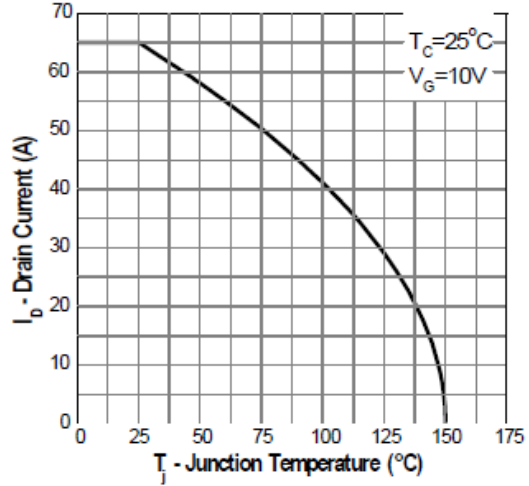
SPN65T10 N-Channel Enhancement Mode MOSFET

TYPICAL CHARACTERISTICS

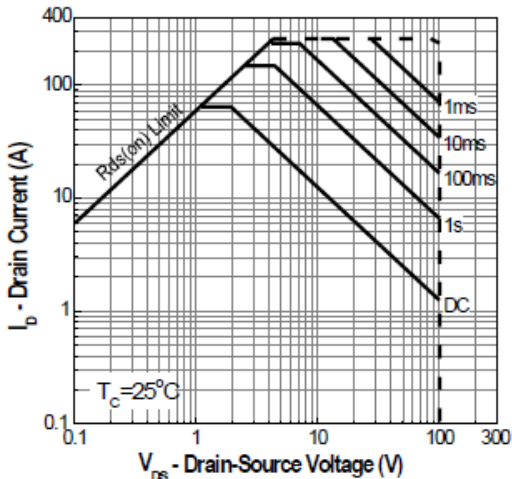
Power Dissipation



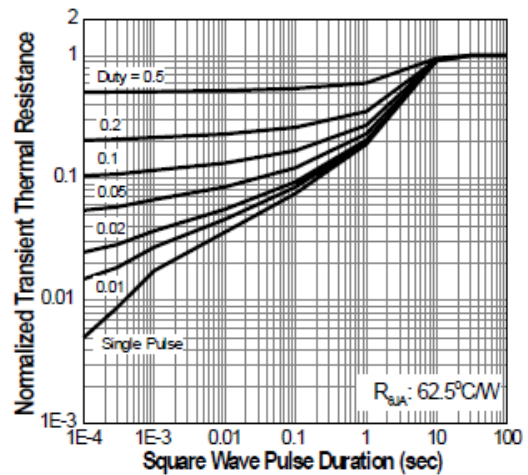
Drain Current vs. Temperature



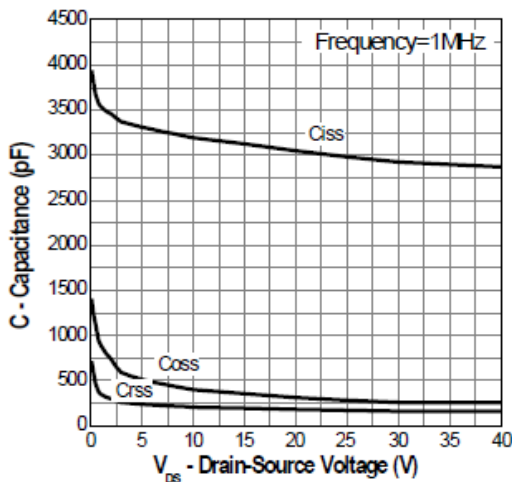
Safe Operation Area



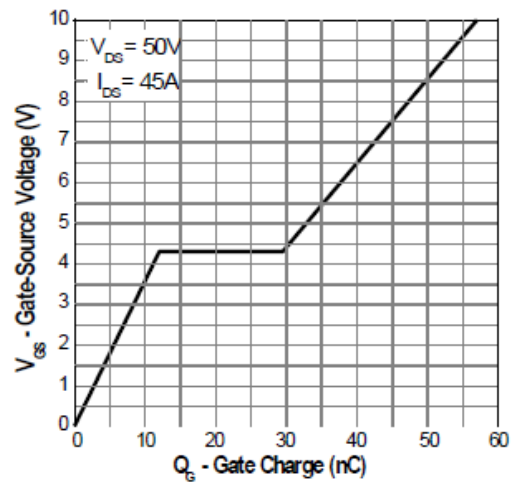
Transient Thermal Impedance



Capacitance Characteristics



Gate-Charge Characteristics

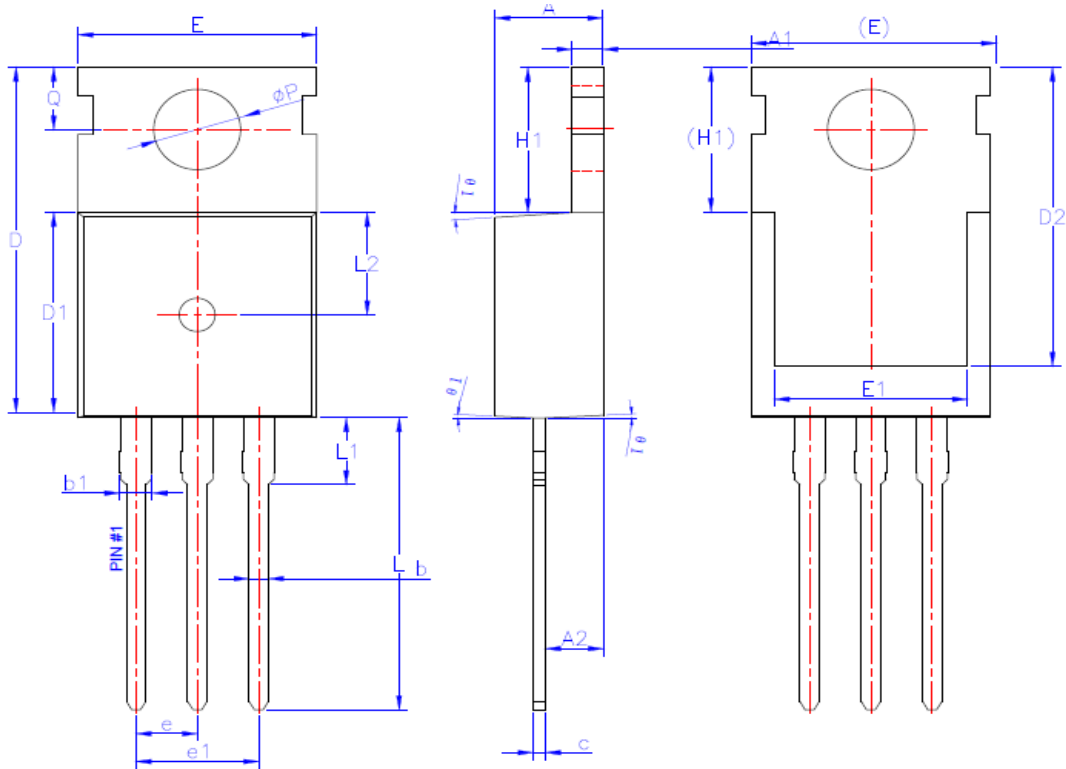




SPN65T10

N-Channel Enhancement Mode MOSFET

TO-220-3L PACKAGE OUTLINE



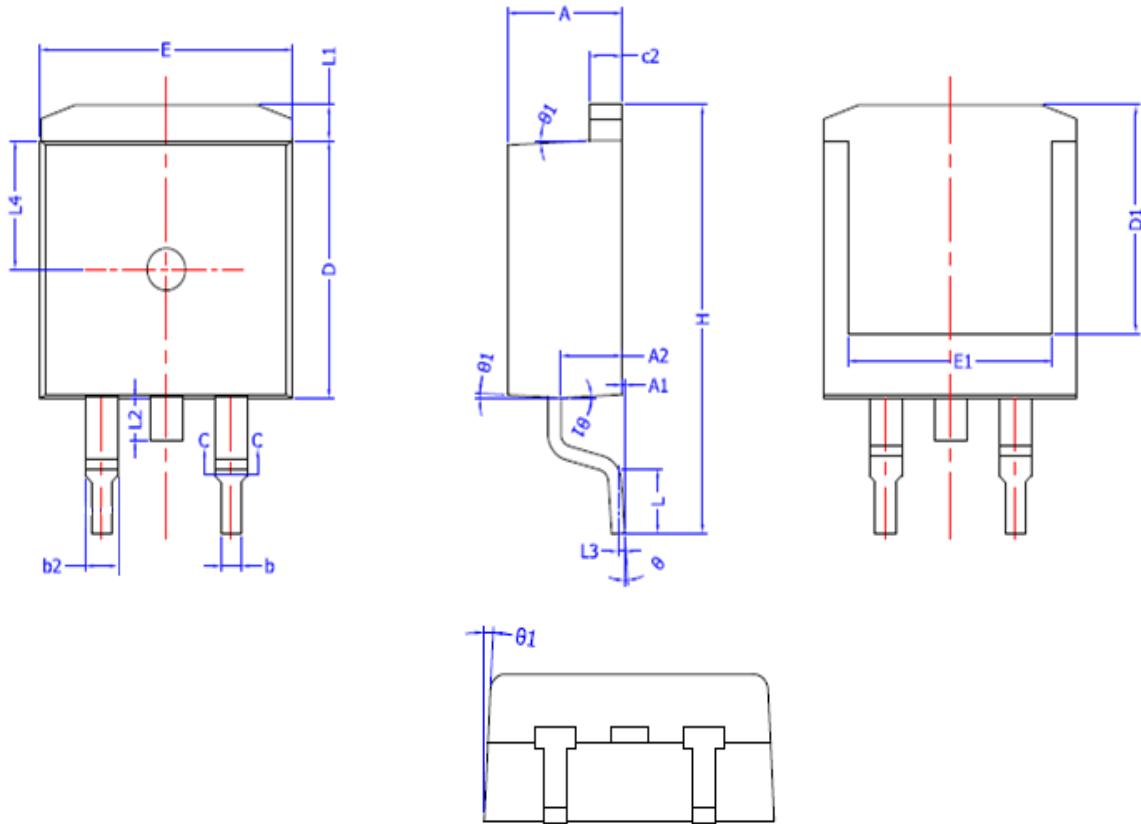
SYMBOL	MIN	NOM	MAX
A	4.40	4.50	4.60
A1	1.27	1.30	1.33
A2	2.30	2.40	2.50
b	0.70	0.60	0.90
b1	-	-	1.40
c	0.45	0.50	0.60
D	15.30	15.70	16.10
D1	9.10	9.20	9.30
D2	13.10	-	13.70
E	9.70	9.90	10.20
E1	7.80	8.00	8.20
e	2.54BSC		
e1	5.08BSC		
H1	6.30	6.50	6.70
L	12.78	13.08	13.38
L1	-	-	3.50
L2	4.6REF		
ϕP	3.55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



SPN65T10

N-Channel Enhancement Mode MOSFET

TO-263-2L PACKAGE OUTLINE



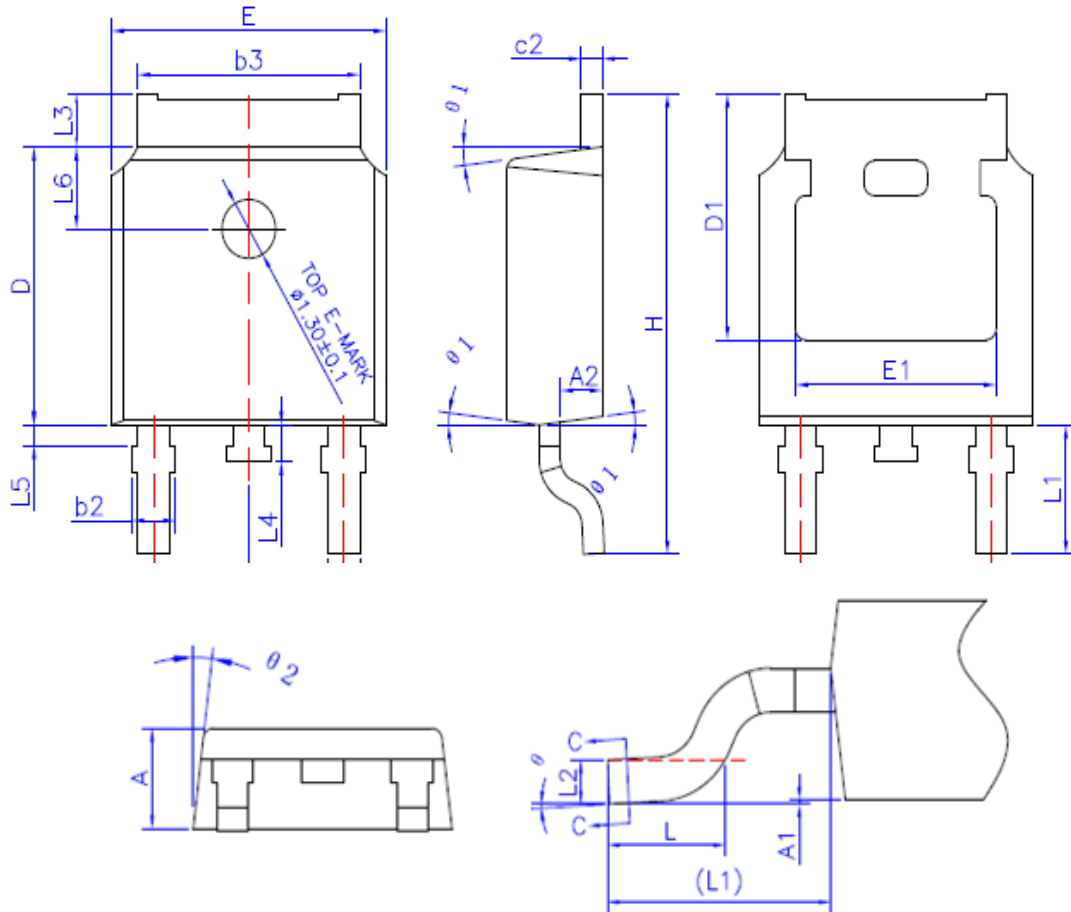
SYMBOL	MIN	NOM	MAX
A	4.40	4.50	4.60
A1	0.00	0.10	0.25
A2	2.20	2.40	2.60
b	0.71	-	0.91
b2	1.17	--	1.37
c	0.47	--	0.60
c2	1.25	1.30	1.35
D	9.10	9.20	9.30
D1	8.00	--	--
E	9.80	9.90	10.00
E1	7.80	--	--
e	2.54BSC		
H	14.90	15.30	15.70
L	2.00	2.30	2.60
L1	1.12	1.27	1.42
L2	--	--	1.75
L3	0.25BSC		
L4	4.60 REF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



SPN65T10

N-Channel Enhancement Mode MOSFET

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°



SPN65T10

N-Channel Enhancement Mode MOSFET

Information provided is alleged to be exact and consistent. SYNC Power Corporation presumes no responsibility for the penalties of use of such information or for any violation of patents or other rights of third parties which may result from its use. No license is granted by allegation or otherwise under any patent or patent rights of SYNC Power Corporation. Conditions mentioned in this publication are subject to change without notice. This publication surpasses and replaces all information previously supplied. SYNC Power Corporation products are not authorized for use as critical components in life support devices or systems without express written approval of SYNC Power Corporation.

© The SYNC Power logo is a registered trademark of SYNC Power Corporation

© 2017 SYNC Power Corporation – Printed in Taiwan – All Rights Reserved

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>