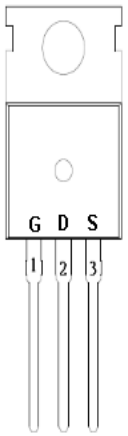
SPN68T10
N-Channel Enhancement Mode MOSFET

DESCRIPTION
The SPN68T10 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.

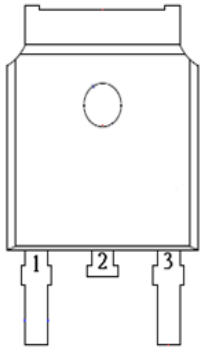
APPLICATIONS
- DC/DC Converter
- Load Switch
- SMPS Secondary Side Synchronous Rectifier
- Power Tool
- Motor Control

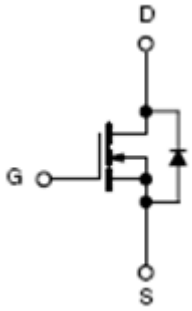
FEATURES
- 100V/68A,$R_{DS(ON)}$=14mΩ@V_{GS}=10V
- Super high density cell design for extremely low $R_{DS\ (ON)}$
- Exceptional on-resistance and maximum DC current capability
- TO-220-3L and TO-252-2L package design

PIN CONFIGURATION
TO-220-3L

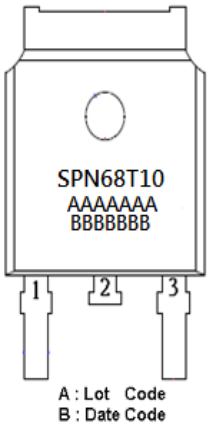


TO-252-2L





PART MARKING

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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
SPN68T10T220TGB	TO-220-3L	SPN68T10
SPN68T10T252RGB	TO-252-2L	SPN68T10

※ SPN68T10T220TGB : Tube ; Pb – Free ; Halogen – Free
※ SPN68T10T252RGB : Tape Reel ; Pb – Free ; Halogen – Free

ABSOULTE MAXIMUM RATINGS

(T_A=25℃ Unless otherwise noted)

Parameter		Symbol	Typical	Unit
Drain-Source Voltage		V_{DSS}	100	V
Gate –Source Voltage		V_{GSS}	±20	V
Continuous Drain Current(Silicon Limited)	T_C=25℃	I_D	75	A
	T_C=70℃		60	
Pulsed Drain Current		I_{DM}	301	A
Power Dissipation@ T_C=25℃		P_D	166.7	W
Avalanche Energy with Single Pulse (Tj=25℃, L=0.1mH , I_{AS}=15A , V_{DD}=25V , V_{GS}=10V)		EAS	113	mJ
Operating Junction Temperature		T_J	-55/150	℃
Storage Temperature Range		T_{STG}	-55/150	℃
Thermal Resistance-Junction to Case (TO-220-3L)		$R_{\theta JC}$	1.2	℃/W
Thermal Resistance-Junction to Case (TO-252-2L)		$R_{\theta JC}$	1.35	℃/W

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

SPN68T10
N-Channel Enhancement Mode MOSFET

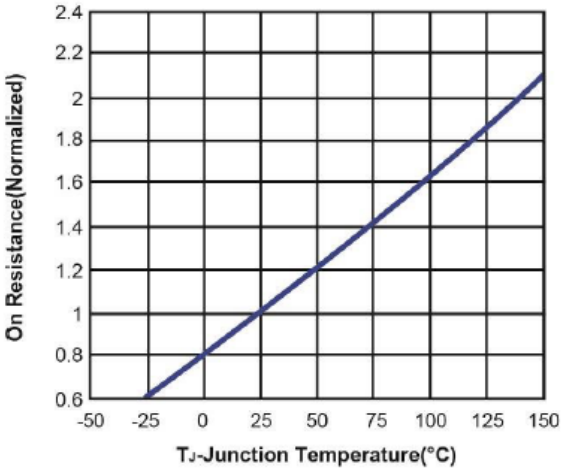
ELECTRICAL CHARACTERISTICS

(T_A=25℃ Unless otherwise noted)

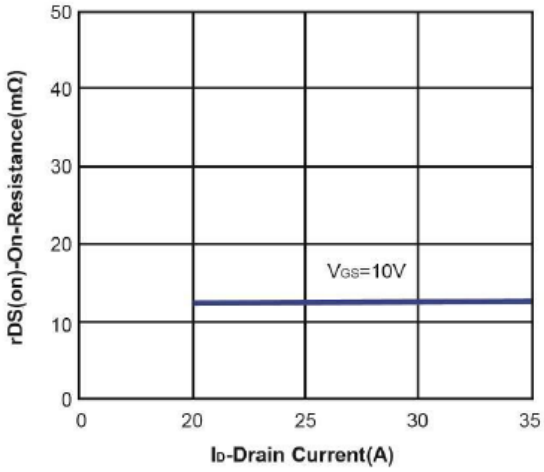
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=250uA	100			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	2.0		4.0	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=80V,V_{GS}=0V T_J = 25℃			1	uA
		V_{DS}=80V,V_{GS}=0V T_J = 55℃			5	
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=30A		12.5	14	mΩ
Diode Forward Voltage	V_{SD}	I_S=1A,V_{GS}=0V		0.6	1.2	V
Dynamic						
Total Gate Charge	Q_g(10V)	V_{DS}=50V,V_{GS}=10V I_D=11.5A		40		nC
Gate-Source Charge	Q_{gs}			9		
Gate-Drain Charge	Q_{gd}			6		
Input Capacitance	C_{iss}	V_{DD}=30V,V_{GS}=0V f=1MHz		2342		pF
Output Capacitance	C_{oss}			702		
Reverse Transfer Capacitance	C_{rss}			38		
Turn-On Time	$t_{d(on)}$	V_{DD}=50V, I_D=30A,V_{GS}=10V R_G=6Ω		8.4		nS
	t_r			30.3		
Turn-Off Time	$t_{d(off)}$			25.4		
	t_f			12.8		

TYPICAL CHARACTERISTICS

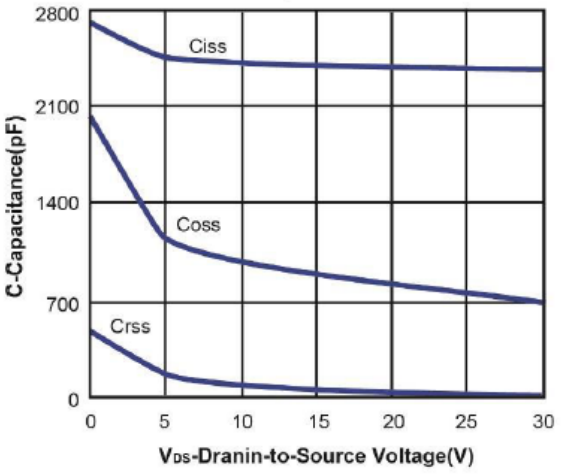
On Resistance vs. Junction Temperature



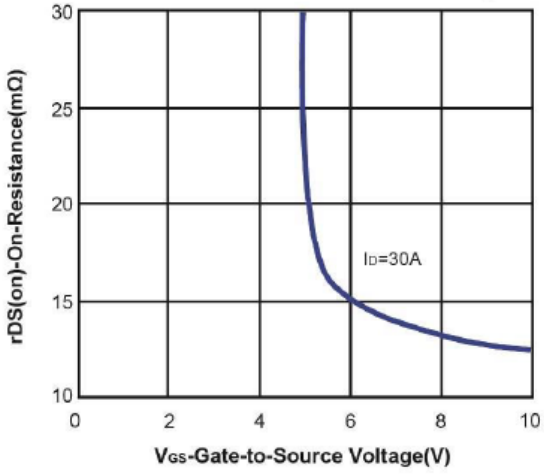
On Resistance vs. Drain Current



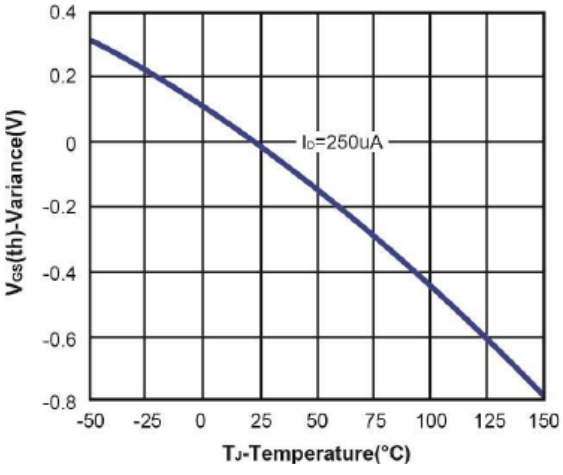
Capacitance



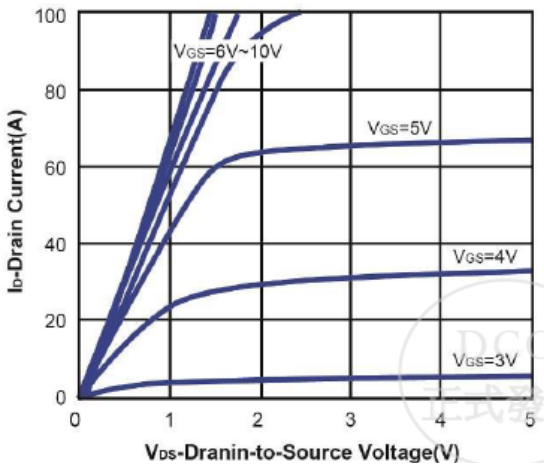
On Resistance vs. Gate-to-Source Voltage



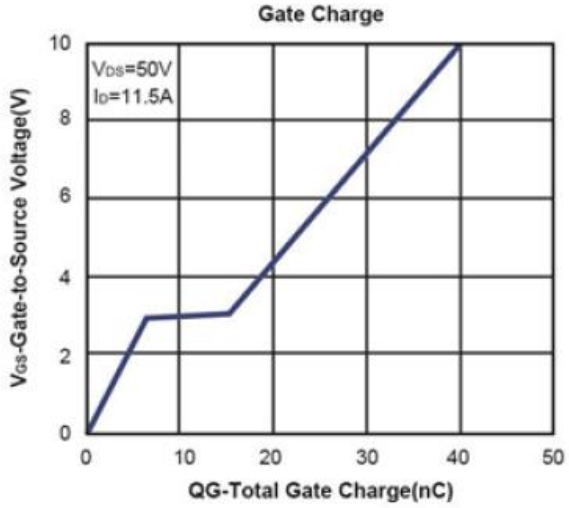
Threshold Voltage

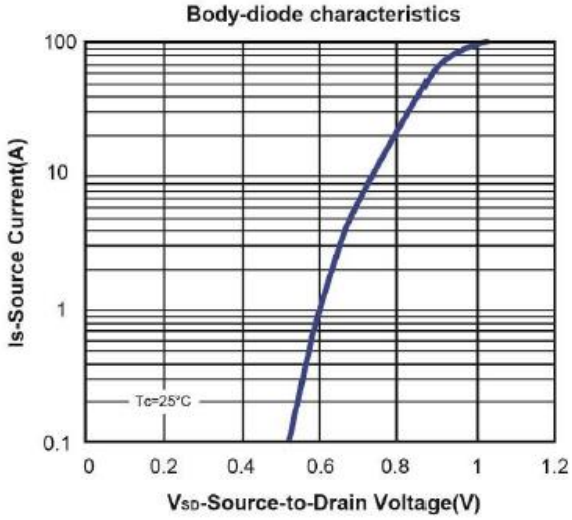


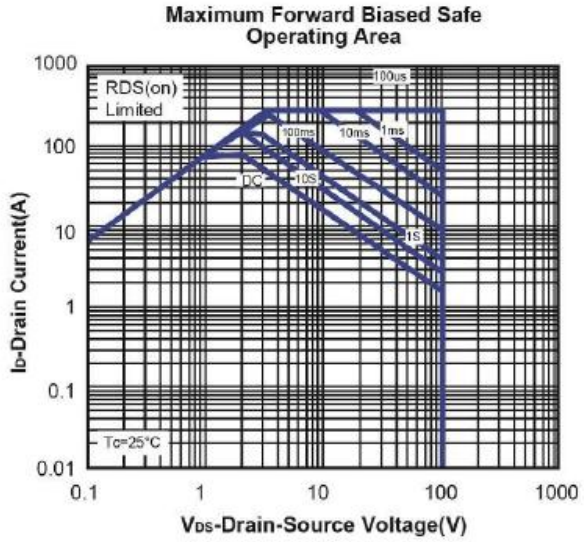
On-Region Characteristics



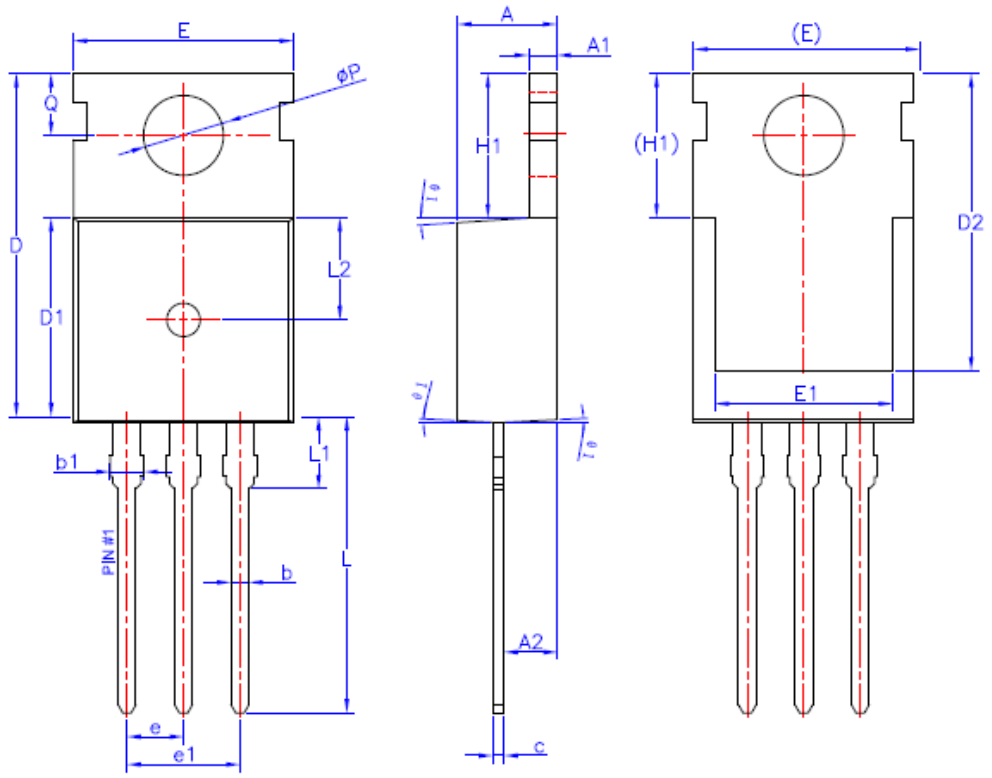
TYPICAL CHARACTERISTICS





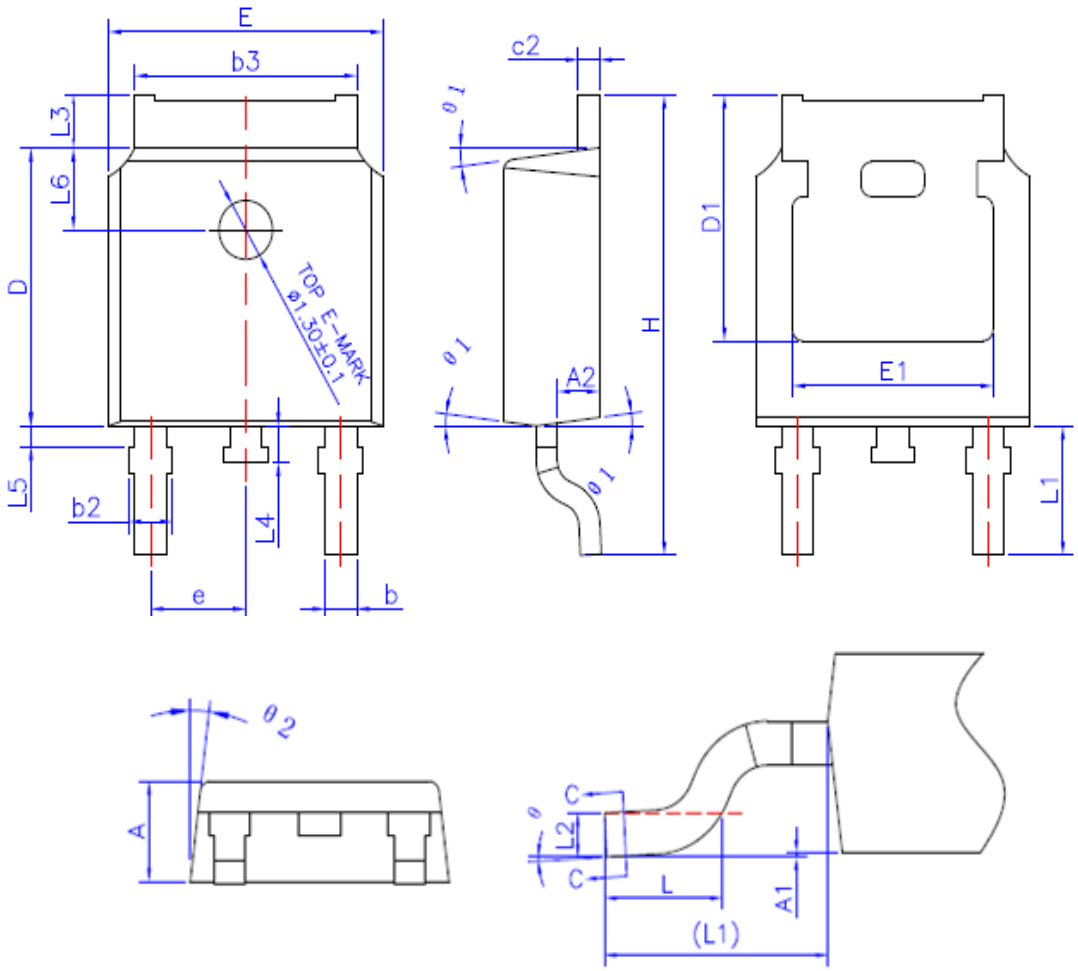


TO-220-3L PACKAGE OUTLINE



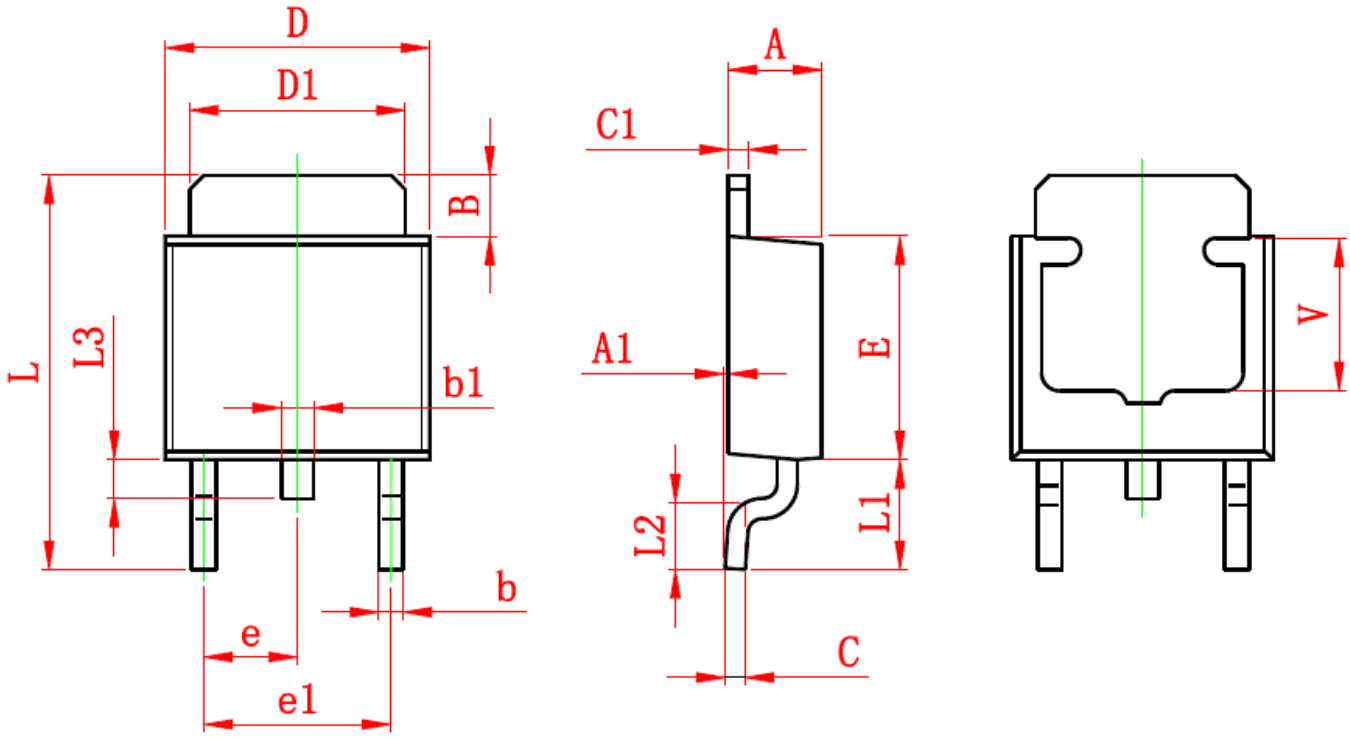
SYMBOL	MIN	NOM	MAX
A	4.40	4.50	4.60
A1	1.27	1.30	1.33
A2	2.30	2.40	2.50
b	0.70	–	0.90
b1	1.42	–	1.57
c	0.45	0.50	0.60
D	15.30	15.70	16.10
D1	9.10	9.20	9.30
D2	13.10	–	13.70
E	9.70	9.90	10.20
E1	7.80	8.00	8.20
e	2.54BSC		
e1	5.08BSC		
H1	6.30	6.50	6.70
L	12.78	13.08	13.38
L1	–	–	3.50
L2	4.60REF		
ØP	3.55	3.60	3.65
Q	2.73	–	2.87
θ1	1°	3°	5°

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°
θ 1	5°	7°	9°
θ 2	5°	7°	9°

TO-252-2L 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	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	9.500	9.900	0.374	0.390
L1	2.550	2.900	0.100	0.114
L2	1.400	1.780	0.055	0.070
L3	0.600	0.900	0.024	0.035
V	3.800 REF.		0.150 REF.	

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