



3060K (文件编号: S&CIC1695)

N-Channel Trench Power MOSFET

General Description

The 3060K uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 5V. This device is suitable for use as a wide variety of applications.

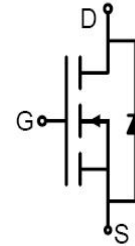
Features

- $V_{DS} = 30V, I_D = 60A$
 $R_{DS(ON)} < 7m\Omega @ V_{GS} = 10V$
 $R_{DS(ON)} < 12m\Omega @ V_{GS} = 5V$
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

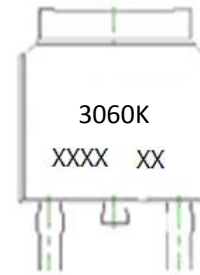
Application

- PWM applications
- Load switch
- Power management

100% UIS TESTED!
100% ΔV_{ds} TESTED!



Schematic Diagram



Marking and pin Assignment



TO-252(DPAK) top view

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
3060K	3060K	TO-252	325mm	16mm	2500

Table 1. Absolute Maximum Ratings ($T_A = 25^\circ C$)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage ($V_{GS} = 0V$)	30	V
V_{GS}	Gate-Source Voltage ($V_{DS} = 0V$)	± 20	V
I_D	Drain Current-Continuous($T_c = 25^\circ C$) (Note 1)	60	A
	Drain Current-Continuous($T_c = 100^\circ C$)	38	A
I_{DM} (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 2)	250	A
PD	Maximum Power Dissipation($T_c = 25^\circ C$)	65	W
	Maximum Power Dissipation($T_c = 100^\circ C$)	33	W
EAS	Avalanche energy (Note 3)	120	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 175	$^\circ C$



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Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
R _{θJC}	Thermal Resistance, Junction-to-Case	-	2.3	°C/W

Table 3. Electrical Characteristics (TA=25°C unless otherwise noted)

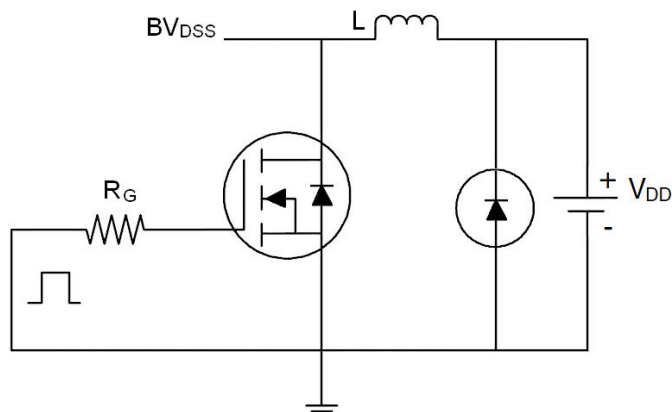
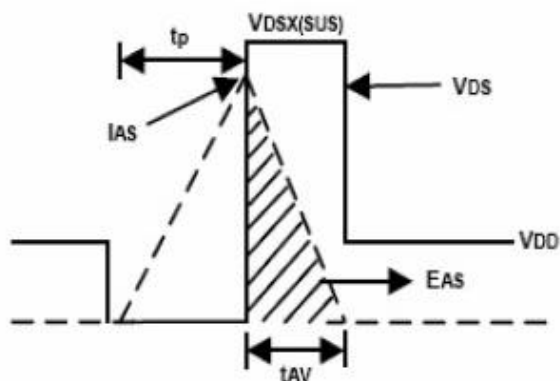
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	30			V
IDSS	Zero Gate Voltage Drain Current	VDS=30V,VGS=0V			1	μA
IGSS	Gate-Body Leakage Current	VGS=±20V,VDS=0V			±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=250μA	1.0	1.5	2.5	V
gFS	Forward Transconductance	VDS=5V,ID=20A		20		S
RDS (ON)	Drain-Source On-State Resistance	VGS=10V, ID=20A(Tc=25℃)		5.5	7.0	mΩ
		VGS=10V, ID=20A (Tc=125℃)		7.3	11	mΩ
		VGS=5V, ID=15A		7.8	12	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=15V,VGS=0V,		1450		pF
Coss	Output Capacitance			230		pF
Crss	Reverse Transfer Capacitance			185		pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz		1.7		Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V, VDS=15V, RL=0.75Ω,RGEN=		9		nS
tr	Turn-on Rise Time			26		nS
td(off)	Turn-Off Delay Time			35		nS
tf	Turn-Off Fall Time			8		nS
Qg	Total Gate Charge	VGS=10V, VDS=25V, ID=14A		35		nC
Qgs	Gate-Source Charge			6		nC
Qgd	Gate-Drain Charge			12		nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)				60	A
VSD	Forward on Voltage	VGS=0V,IS=20A			1.2	V

Notes 1. The maximum current rating is package limited.

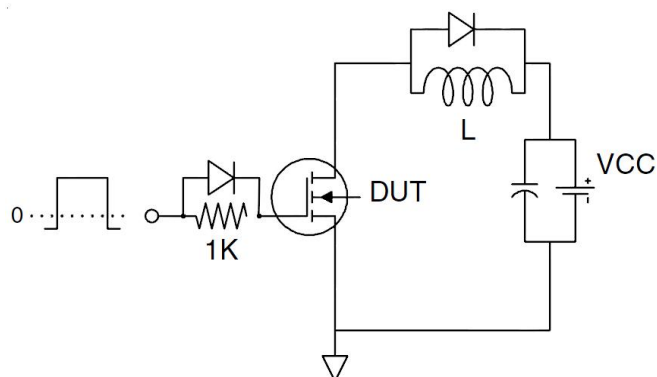
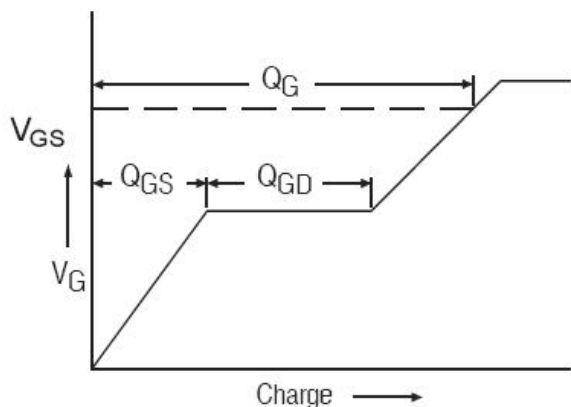
Notes 2. Repetitive Rating: Pulse width limited by maximum junction temperature Notes 3. EAS condition: TJ=25°C, VDD=15V, VG=10V, RG=25Ω

Test Circuit

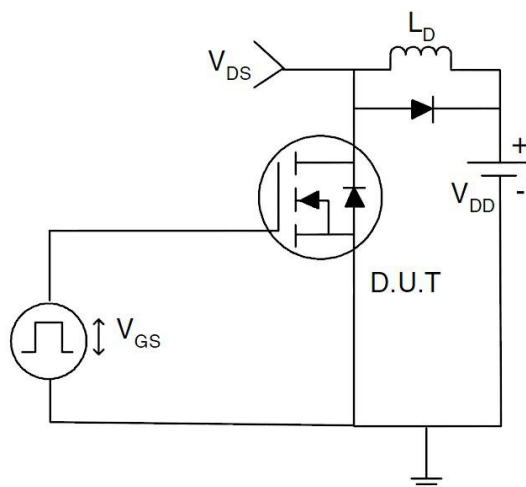
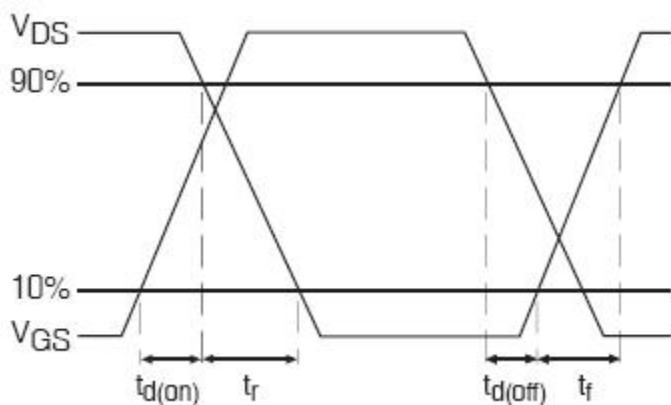
1) E_{AS} Test Circuits



2) Gate Charge Test Circuit:



3) Switch Time Test Circuit:





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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)

Figure 1. Output Characteristics

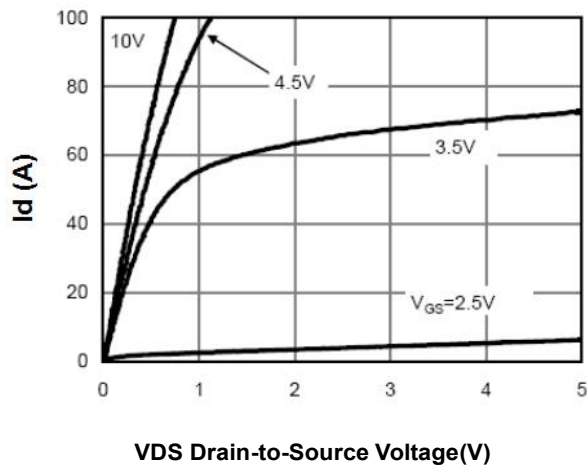


Figure 2. Transfer Characteristics

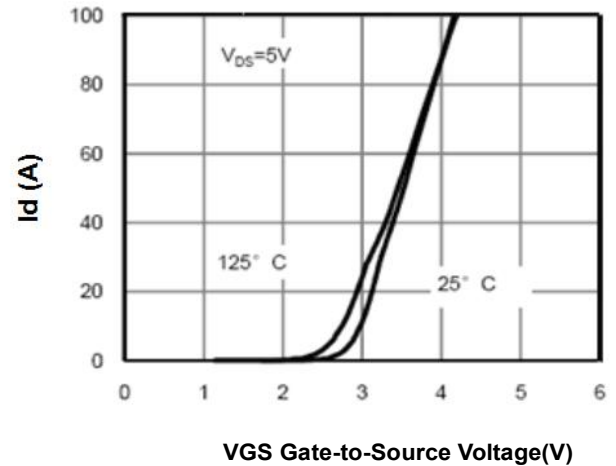


Figure 3. Max BV_{DSS} vs Junction Temperature

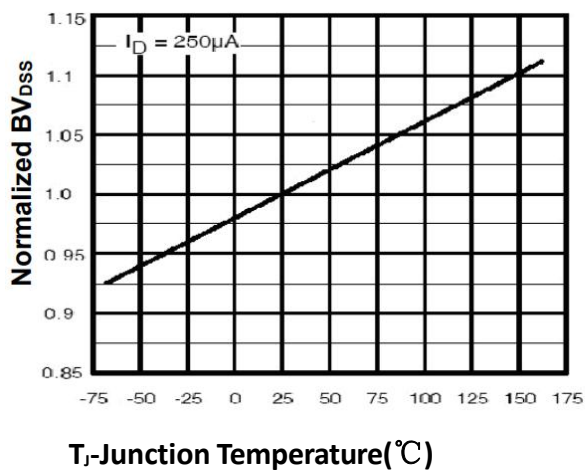


Figure 4. Drain Current

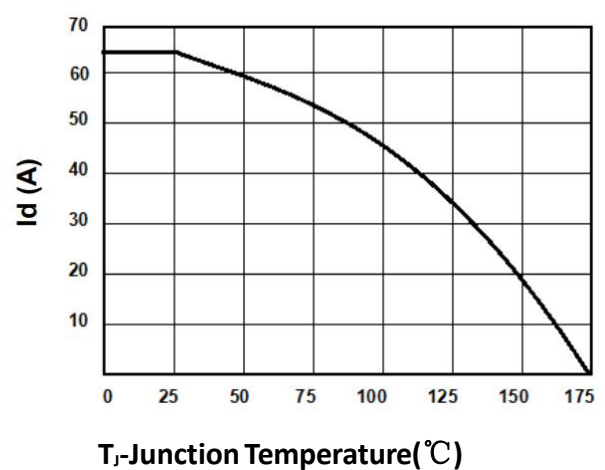


Figure 5. $V_{GS(th)}$ vs Junction Temperature

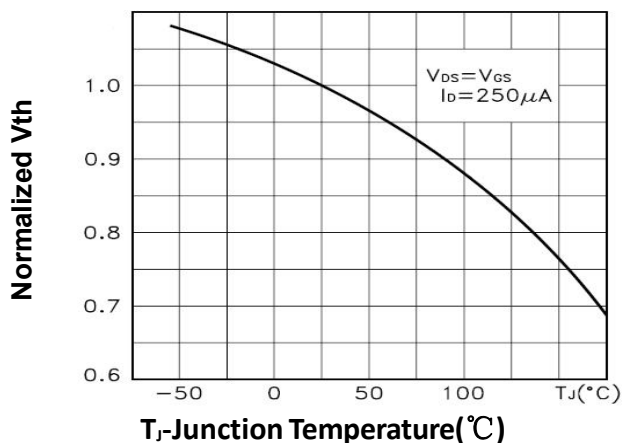
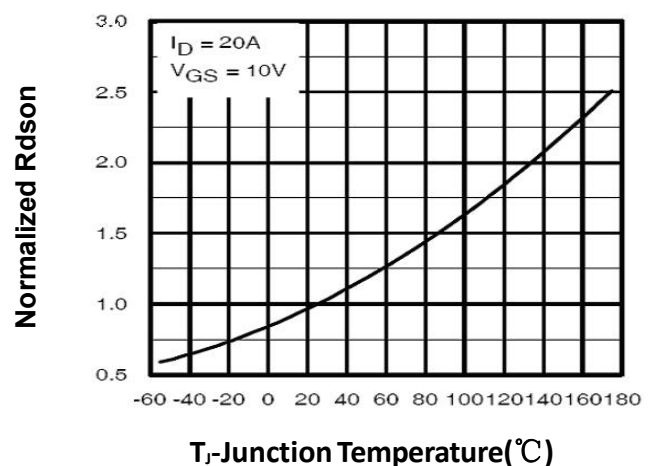


Figure 6. $R_{DS(on)}$ vs Junction Temperature





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Figure 7. Gate Charge Waveforms

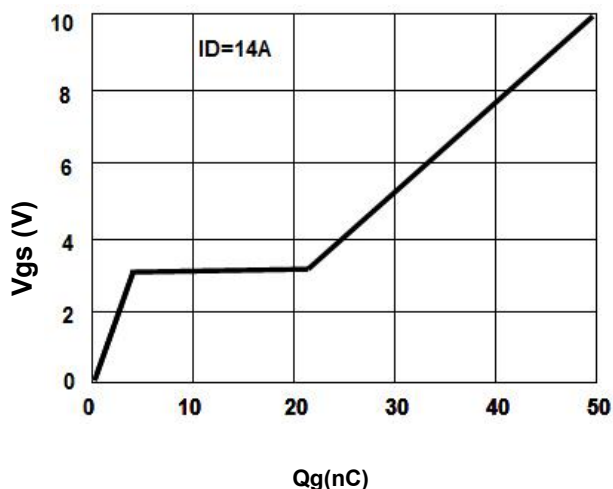


Figure 9. Body-Diode Characteristics

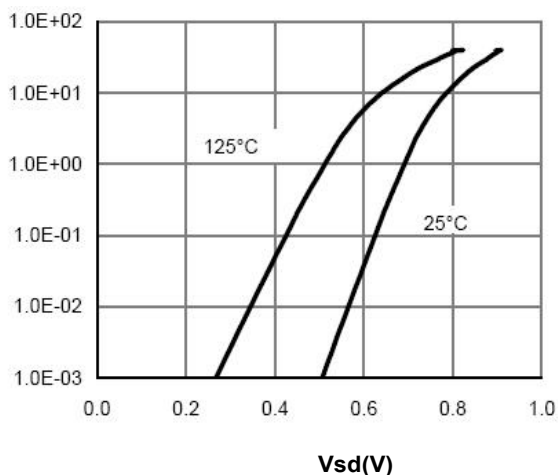


Figure 8. Capacitance

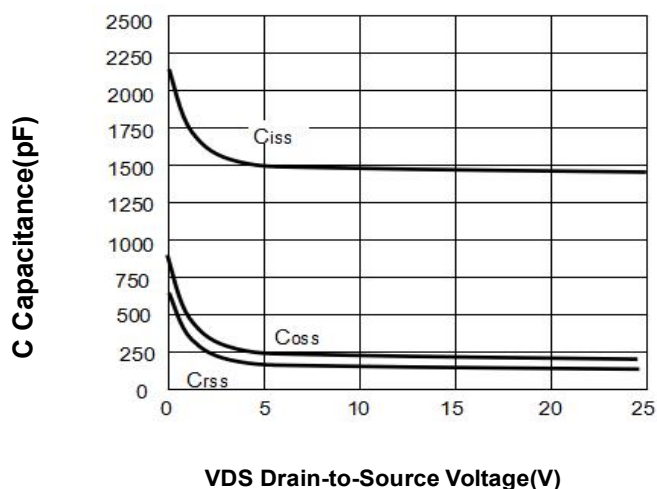


Figure 10. Maximum Safe Operating Area

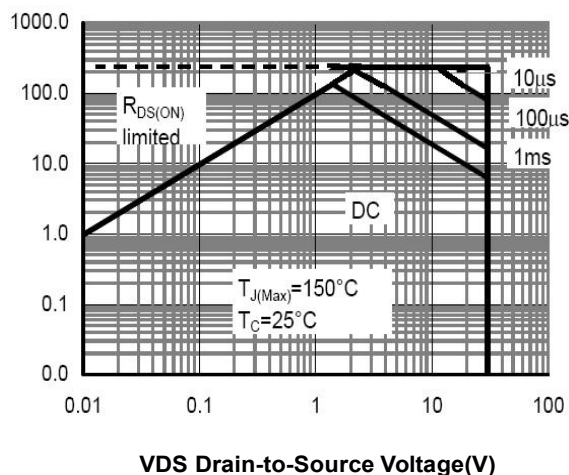
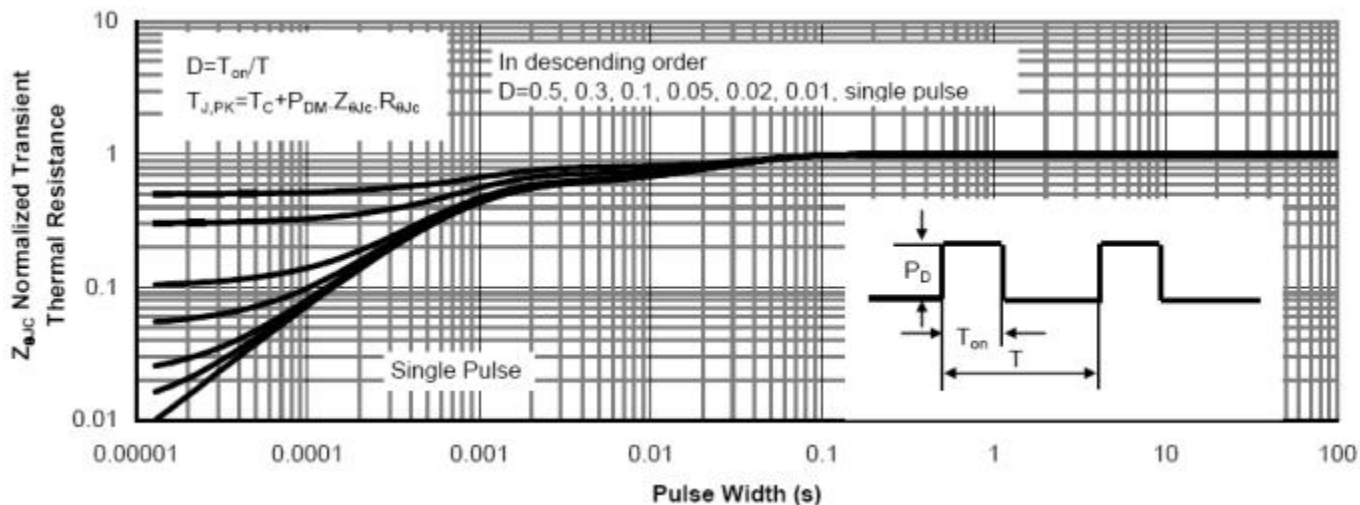


Figure 11. Normalized Maximum Transient Thermal Impedance

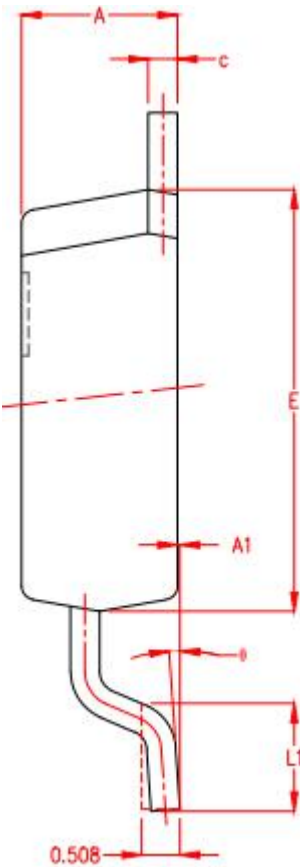
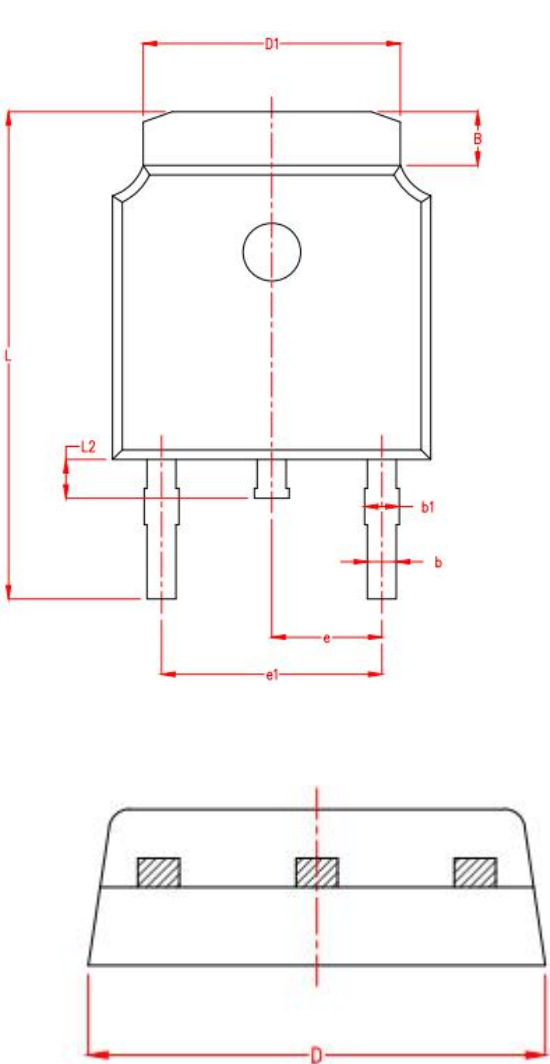




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TO-252 Package Information



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	2.15	2.25	2.35
A1	0.00	0.06	0.12
B	0.96	1.11	1.26
b	0.59	0.69	0.79
b1	0.69	0.81	0.93
c	0.34	0.42	0.50
D	6.45	6.60	6.75
D1	5.23	5.33	5.43
E	5.95	6.10	6.25
e	2.286TYP.		
e1	4.47	4.57	4.67
L	9.90	10.10	10.30
L1	1.40	1.55	1.70
L2	0.60	0.80	1.00
θ	0°	4°	8°