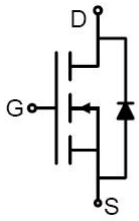
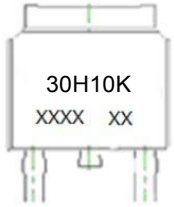
N-Channel Trench Power MOSFET

General Description

The 30H10K uses advanced trench technology to provide excellent RDS(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.



Schematic Diagram



Marking and pin Assignment

TO-252(DPAK) top view

Features

- VDS = 30V,ID =100A
  RDS(ON) < 4.2mΩ @
  VGS =10V RDS(ON) <
  7mΩ @ VGS =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% ΔVds TESTED!

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
30H10K	30H10K	TO-252	325mm	16mm	2500

Table 1. Absolute Maximum Ratings (T_A=25℃)

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	30	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Tc=25℃)	100	A
	Drain Current-Continuous(Tc=100℃)	70	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed **(Note 1)**	400	A
PD	Maximum Power Dissipation(Tc=25℃)	88	W
	Maximum Power Dissipation(Tc=100℃)	44	W
EAS	Avalanche energy **(Note 2)**	320	mJ
TJ,TSTG	Operating Junction and Storage Temperature Range	-55 To 175	℃

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature Notes 2.EAS condition: TJ=25℃,VDD=20V,VG=10V, RG=25Ω

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
RθJC	Thermal Resistance, Junction-to-Case	-	1.7	℃/W

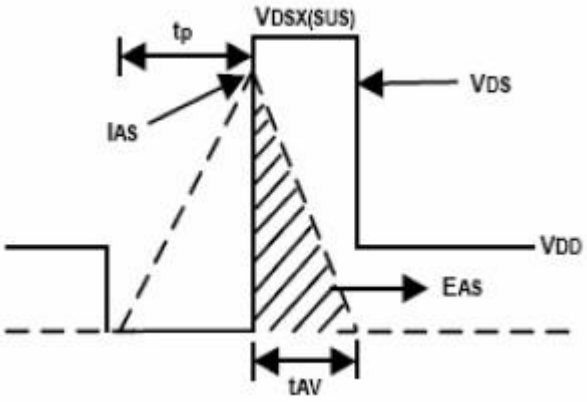
Table 3. Electrical Characteristics (TA=25℃unless otherwise noted)

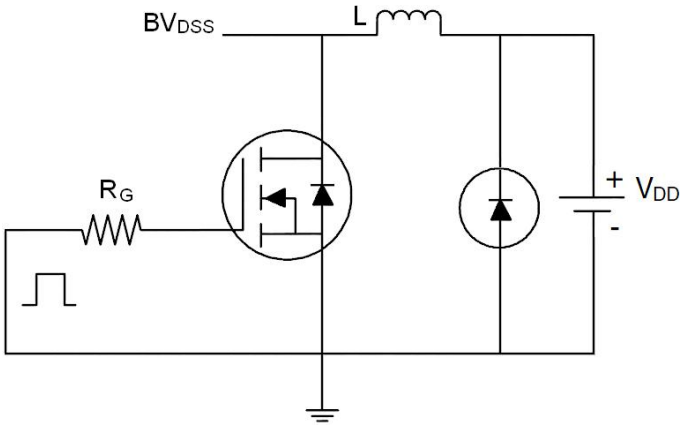
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	30			V
IDSS	Zero Gate Voltage Drain Current	VDS=30V,VGS=0V			1	μA
IGSS	Gate-Body Leakage Current	VGS=±20V,VDS=0V			±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=250μA	1	1.5	2.5	V
gFS	Forward Transconductance	VDS=5V,ID=15A		30		S
RDS(ON)	Drain-Source On-State Resistance	VGS=10V, ID=20A		3.6	4.2	mΩ
		VGS=5V, ID=15A		4.6	7	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=15V,VGS=0V, f=1.0MHz		2600		pF
Coss	Output Capacitance			412		pF
Crss	Reverse Transfer Capacitance			300		pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz		3.3		Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V, VDS=15V, RL=0.75Ω,RGEN=3Ω		13		nS
tr	Turn-on Rise Time			16		nS
td(off)	Turn-Off Delay Time			40		nS
tf	Turn-Off Fall Time			14		nS
Qg	Total Gate Charge	VGS=10V, VDS=15V, ID=14A		58		nC
Qgs	Gate-Source Charge			7		nC
Qgd	Gate-Drain Charge			18		nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)				100	A
VSD	Forward on Voltage**(Note 1)**	VGS=0V,IS=20A			1.2	V

Notes 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

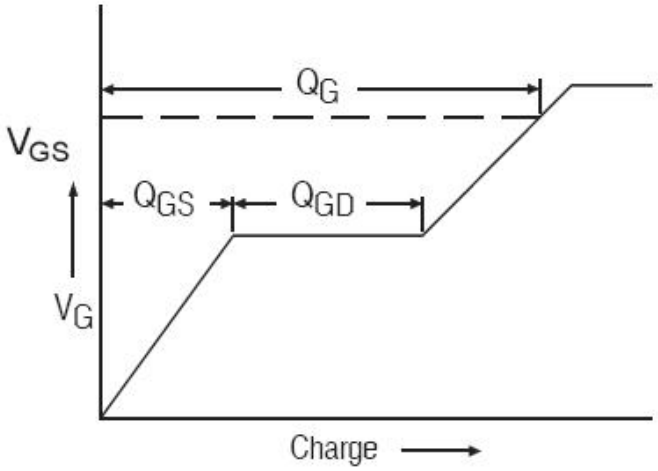
Test Circuit

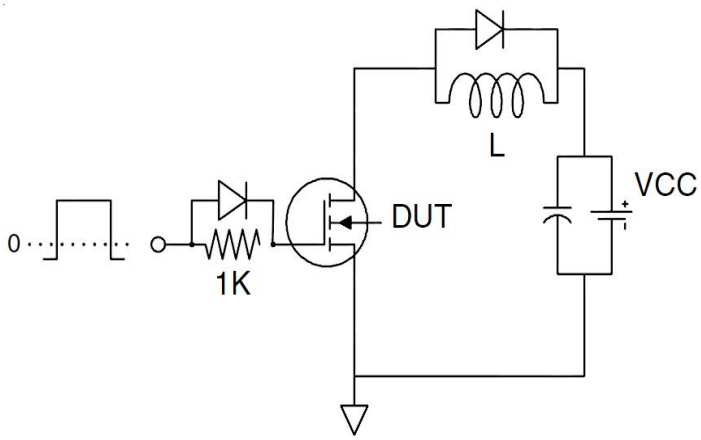
1) E_{AS} Test Circuits



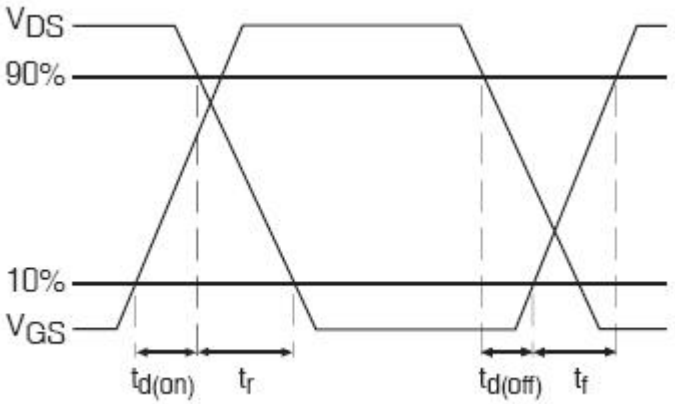


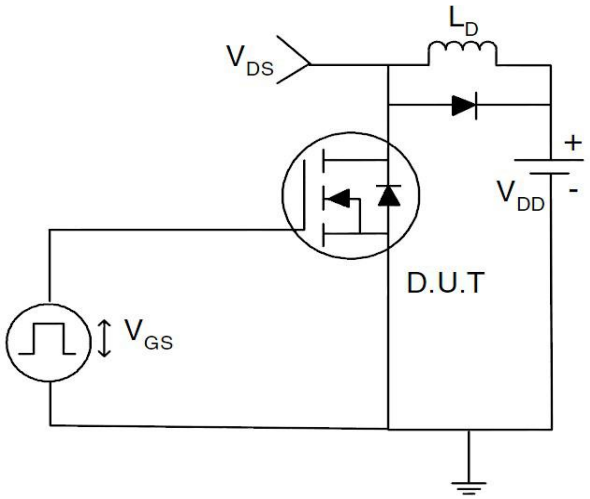
2) Gate Charge Test Circuit:





3) Switch Time Test Circuit：





TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS(Curves)

Figure 1. Output Characteristics

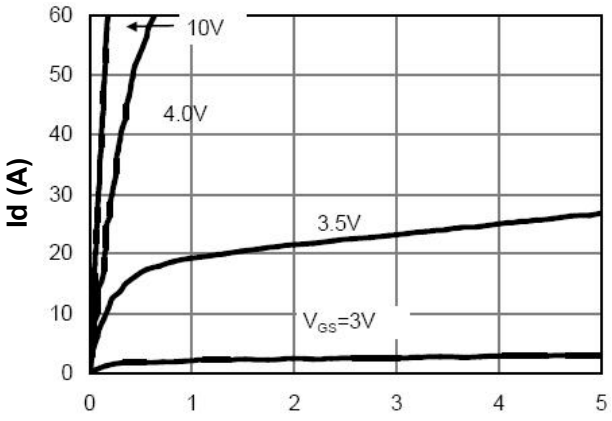


Figure 2. Transfer Characteristics

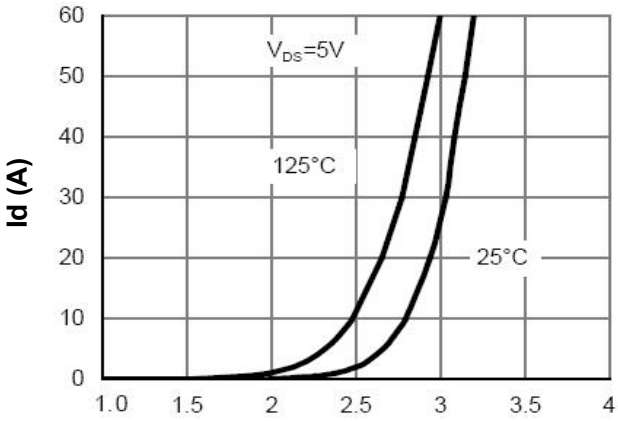


Figure 3. Max BV_{DSS} vs Junction Temperature

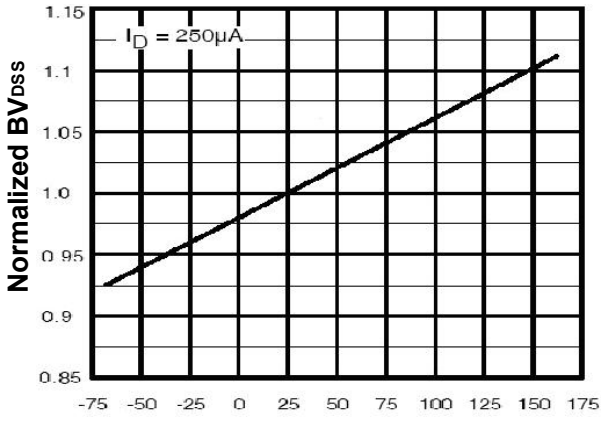


Figure 4. Drain Current

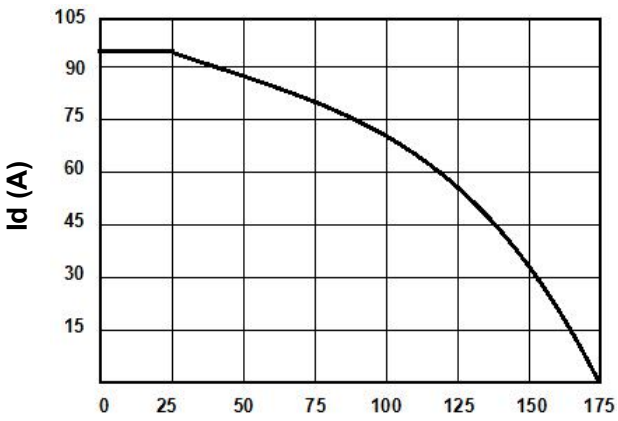


Figure 5. $V_{GS(th)}$ vs Junction Temperature

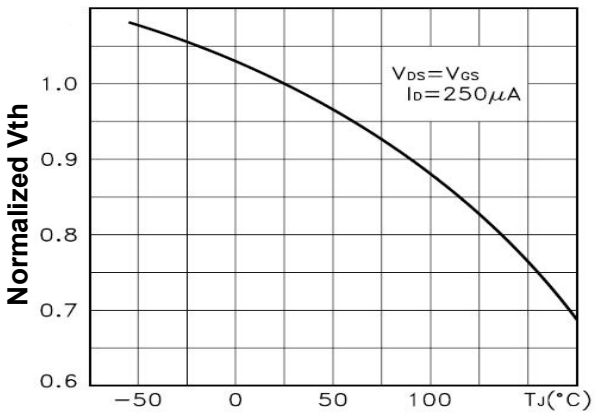


Figure 6. $R_{DS(ON)}$ vs Junction Temperature

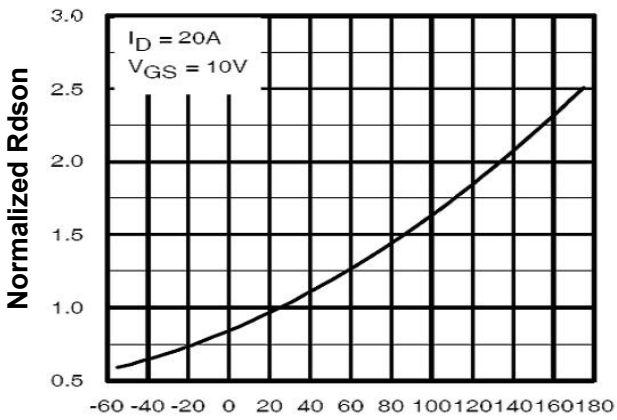


Figure 7. Gate Charge Waveforms

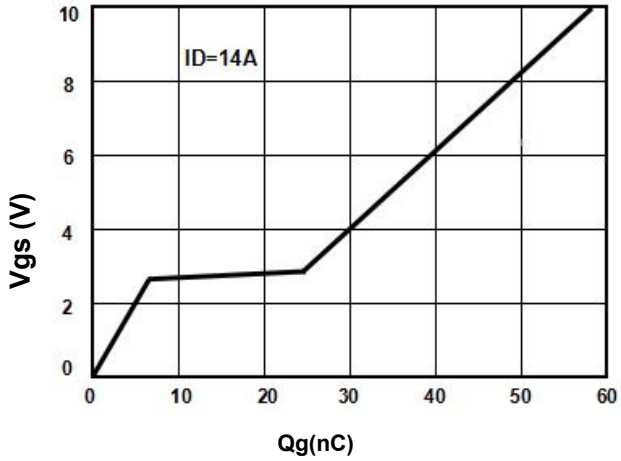


Figure 8. Capacitance

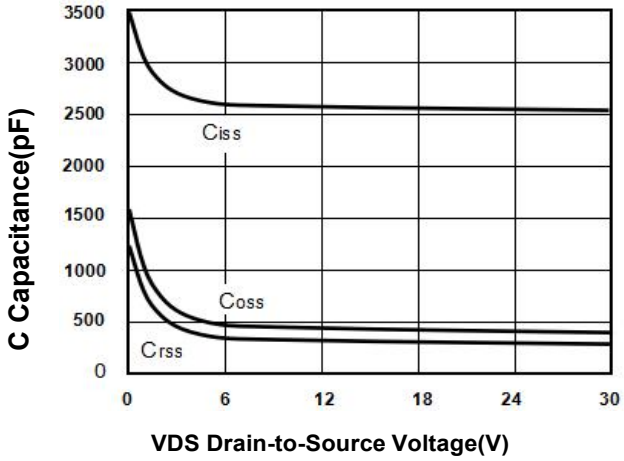


Figure 9. Body-Diode Characteristics

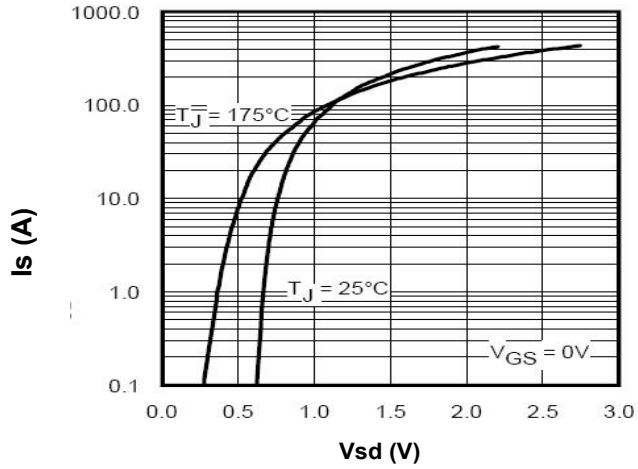


Figure 10. Maximum Safe Operating Area

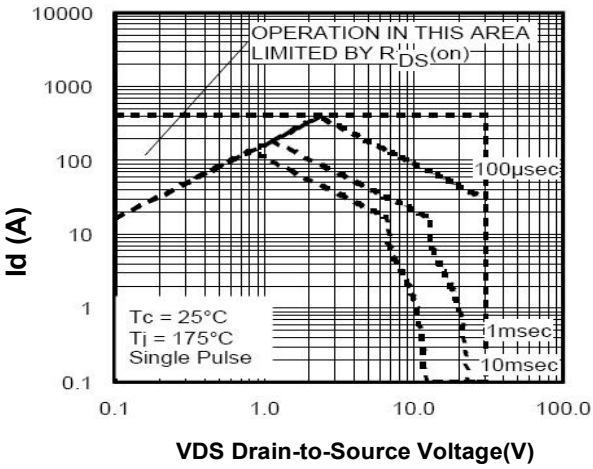
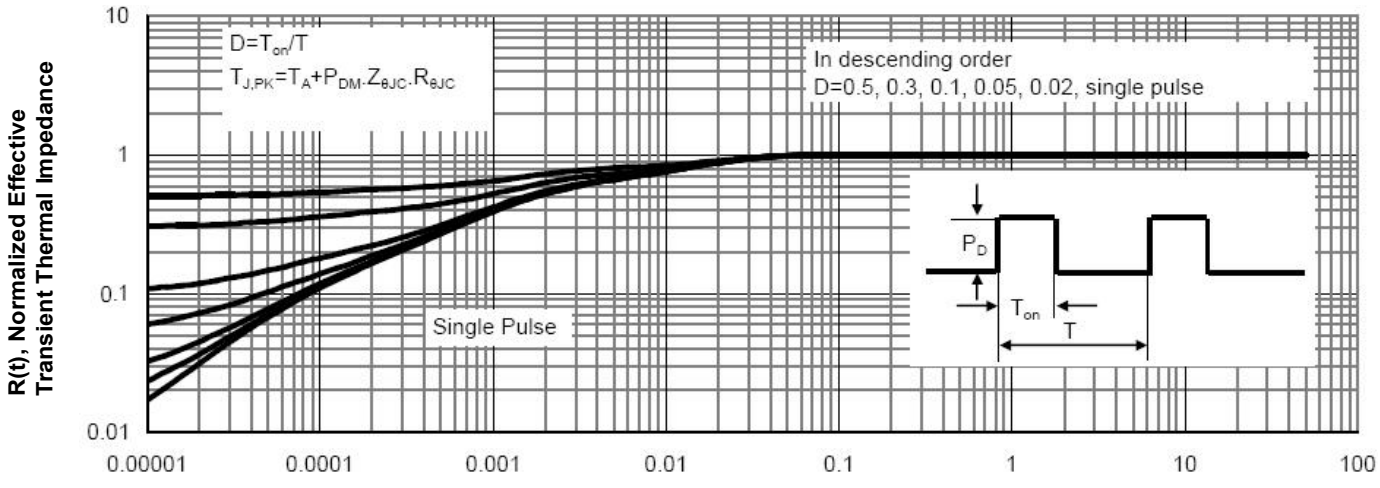
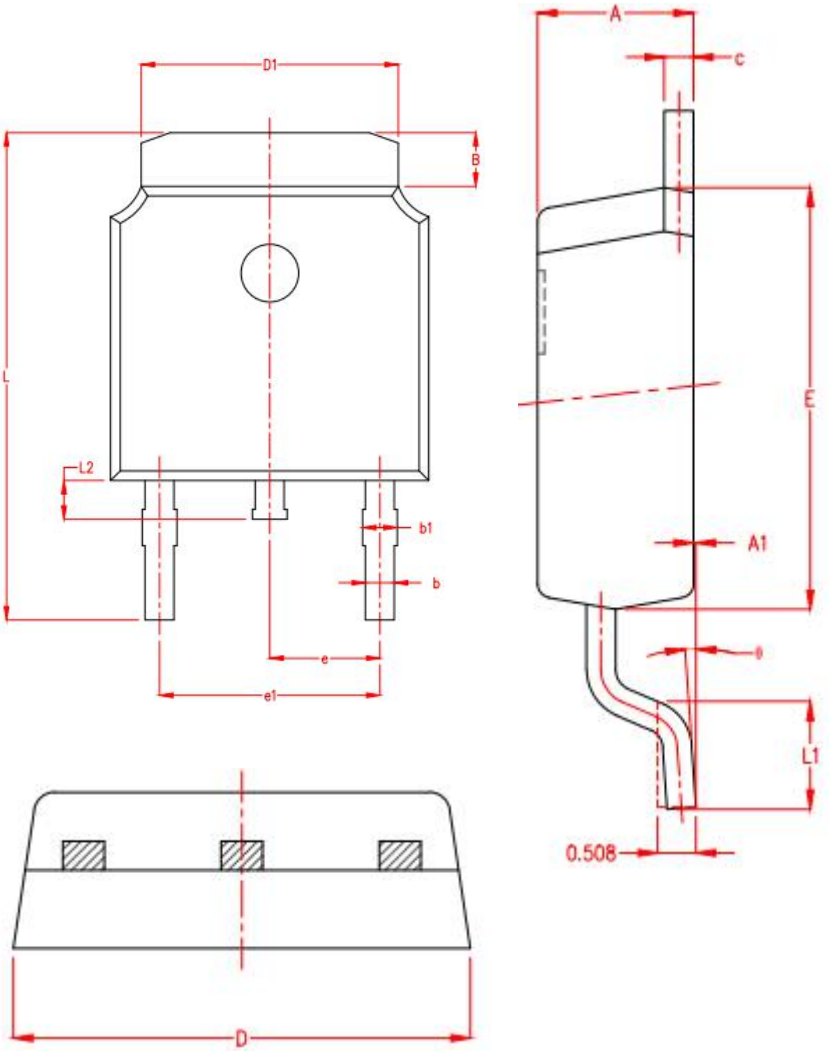


Figure 11. Normalized Maximum Transient Thermal Impedance



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°