KJ011N045T

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☑ Trench Power SGT technology
- ☑ Low Gate Charge
- ☑ Very low on-resistance $R_{DS(ON)}$

1.2 Applications

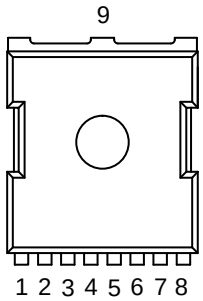
- ☑ Power Tool appliances
- ☑ High power inverter system
- ☑ BMS appliances

1.3 Quick reference

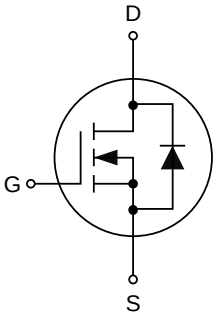
- ☑ BV ≥ 45 V
- ☑ $R_{DS(ON)}$ ≤ 1.15 mΩ @V_{GS} = 10 V
- ☑ P_D ≤ 240 W
- ☑ I_D ≤ 300 A

2. Pin Description

Pin	Description
1	Gate
2,3,4,5,6,7,8	Source
9	Drain



Top View
TOLL-8L



3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	T_A=25℃	-	45	V
V_{GS}	Gate-Source Voltage	T_A=25℃	-	±20	V
I_D	Continuous Drain Current	T_C=25℃, V_{GS}=10 V	-	300	A
		T_C=100℃, V_{GS}=10 V	-	182	A
I_{DM} *	Pulsed Drain Current	T_A=25℃, V_{GS}=10 V	-	725	A
I_{AS} *	Avalanche Current		-	46	A
E_{AS} **	Single Pulsed Avalanche Energy	L=0.5 mH	-	780	mJ
P_D	Drain Power Dissipation	T_C=25℃	-	240	W
	-Derating Factor		-	2	W/℃
T_J, T_{stg}	Operating Junction and Storage Temperature Range		-55	150	℃
$R_{\theta JA}$ *	Thermal Resistance-Junction to Ambient, Steady-State		-	50	℃/W
$R_{\theta JC}$	Thermal Resistance-Junction to Case, Steady-State		-	1.0	

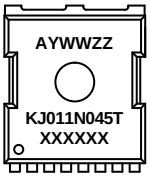
Notes:

* Single pulse width limited by maximum junction temperature.

** T_J=25℃,V_{DD}=40 V,V_{GS}=10 V, L=1.0 mH, R_g=2 Ω

*** The power dissipation P_D is based on T_J(MAX) =150℃, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

4. Marking Information

Product Name	Marking
KJ011N045T	

5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity (pcs)
KJ011N045T	**TOLL-8L**	**13"**	**24 mm**	**2000**

Note: KUAIJIEXIN defines “Green” as lead-free (RoHS compliant) and halogen free (Br or Cl does not exceed 900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight; Follow IEC 61249-2-21 and IPC/JEDEC J-STD-020C)

6. Electrical Characteristics (T_A=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0 V, I_{DS}=250 μA	45	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250 μA	1	1.5	2	V
I_{DSS}	Zero Gate Voltage Source Current	V_{DS}=45 V, V_{GS}=0 V,T_J=25℃	-	-	1	μA
		V_{DS}=45 V, V_{GS}=0 V,T_J=100℃	-	-	100	
I_{GSS}	Gate-Body Leakage Current	V_{DS}=0 V, V_{GS}=±20 V	-	-	±100	nA
$R_{DS(ON)}$ [a]	Drain-Source On-Resistance	V_{GS}=10 V, I_{DS}=50 A	-	1.0	1.15	mΩ
		V_{GS}=6 V, I_{DS}=50 A	-	1.15	1.35	mΩ
g_{FS}	Forward Transconductance	V_{DS}=10 V, I_D=10 A	-	60	-	S
V_{SD} [a]	Diode Forward Voltage	I_{SD}=20 A, V_{GS}=0 V	-	-	1.2	V
I_S	Maximum Body-Diode Continuous Current		-	-	300	A
Dynamic Characteristics [b]						
C_{iss}	Input Capacitance	V_{DS}=20 V, V_{GS}=0 V, Frequency=1 MHz	-	7542	-	pF
C_{oss}	Output Capacitance		-	1176	-	
C_{rss}	Reverse Transfer Capacitance		-	1167	-	
Switching Parameters [b]						
Q_g	Total Gate Charge	V_{DS}=20 V, V_{GS}=10 V, I_{DS}=65 A	-	84	-	nC
Q_{gs}	Gate-Source Charge		-	30	-	
Q_{gd}	Gate-Drain Charge		-	17	-	
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=15 V, V_{GS}=10 V, R_G=1.6 Ω, I_D=65 A	-	12	-	ns
t_r	Turn-on Rise Time		-	48	-	
$t_{d(off)}$	Turn-off Delay Time		-	24	-	
t_f	Turn-off Fall Time		-	9.2	-	
t_{rr}	Body Diode Reverse Recovery Time	V_{GS}=0 V, I_F=60 A, dI_{SD}/dt=100 A/μs	-	24	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	44	-	nC

Notes:

a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.

b. Guaranteed by design, not subject to production testing.

7. Typical Electrical and Thermal Characteristics

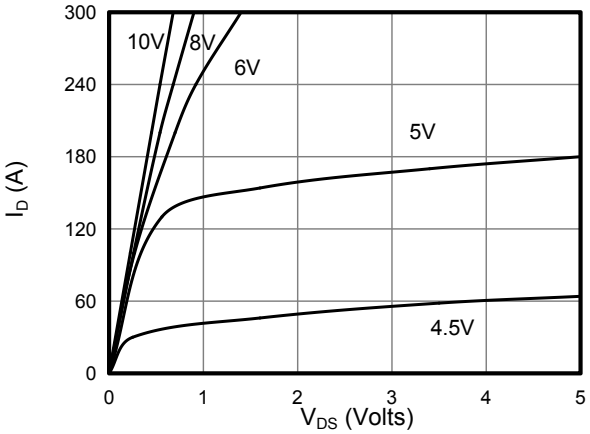


Figure 1: On-Region Characteristics

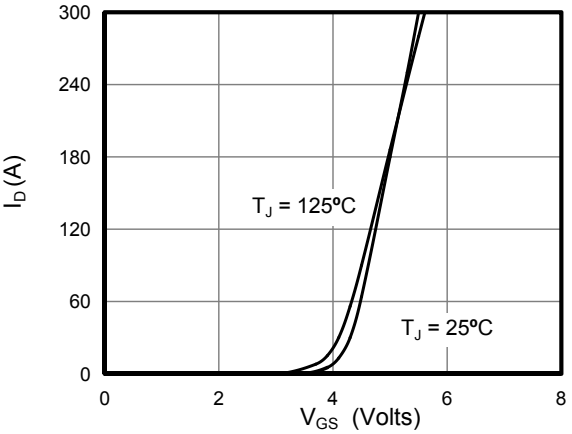


Figure 2: Transfer Characteristics

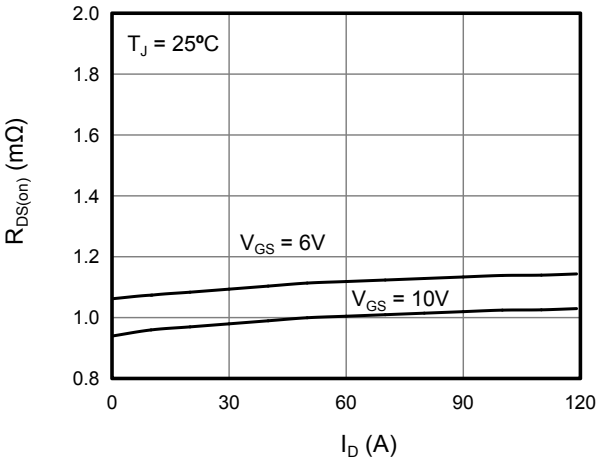


Figure 3: On-Resistance vs. Drain Current

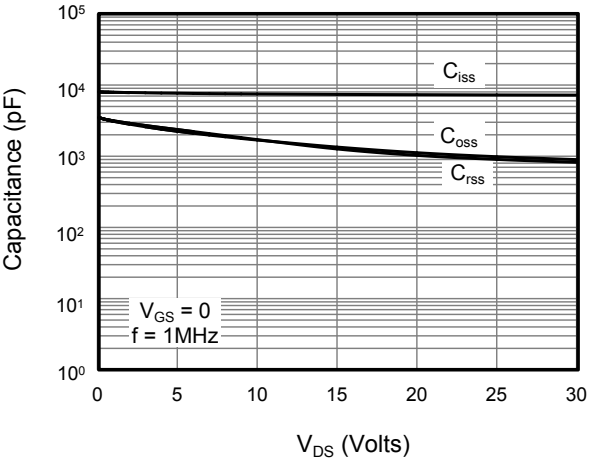


Figure 4: Capacitance Characteristics

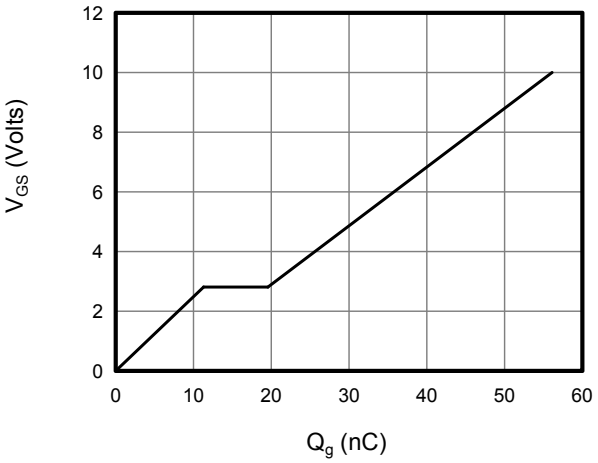


Figure 5: Gate Charge Characteristics

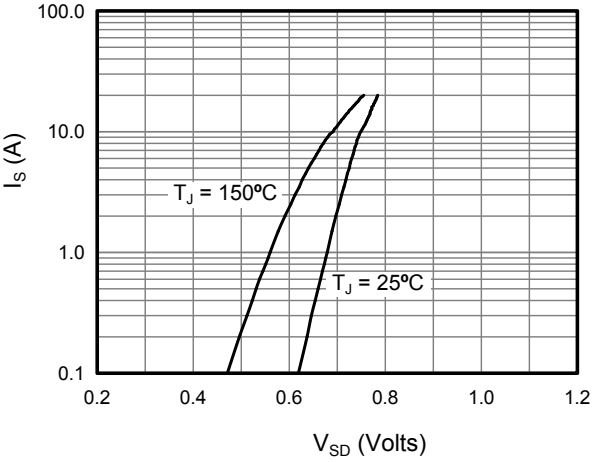


Figure 6: Body Diode Forward Voltage

7. Typical Characteristics(cont.)

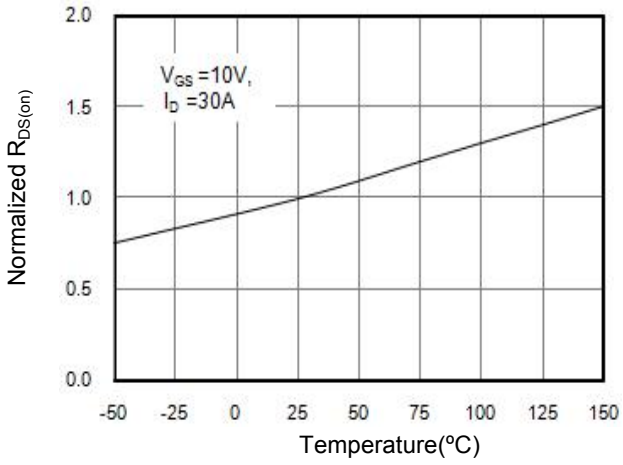


Figure 7: On-Resistance vs. Junction Temperature

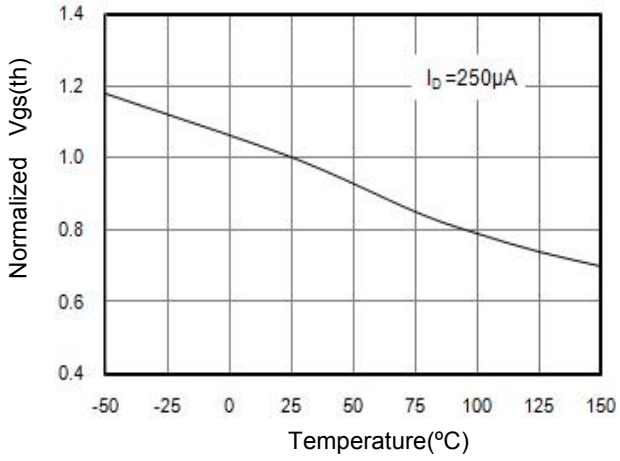


Figure 8: Vgs(th) vs. Junction Temperature

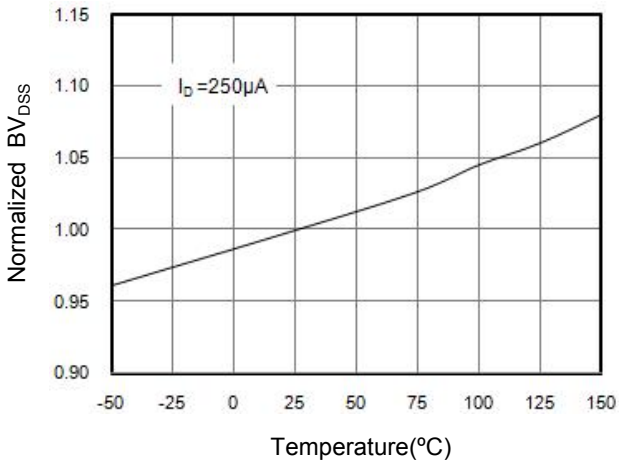


Figure 9: BV_{DSS} vs. Junction Temperature

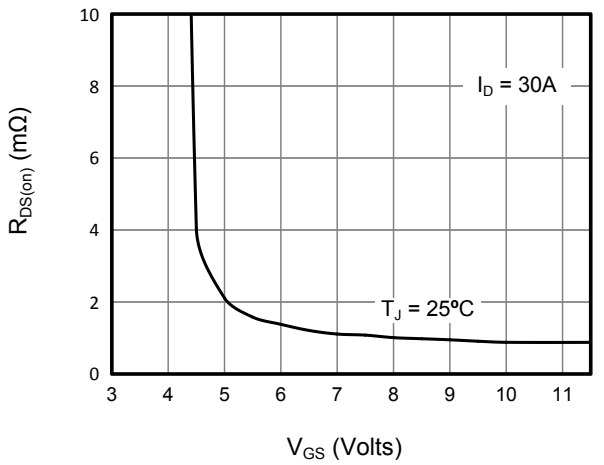


Figure 10: On-Resistance vs. Gate-Source Voltage

Figure A：Gate Charge Test Circuit and Waveforms

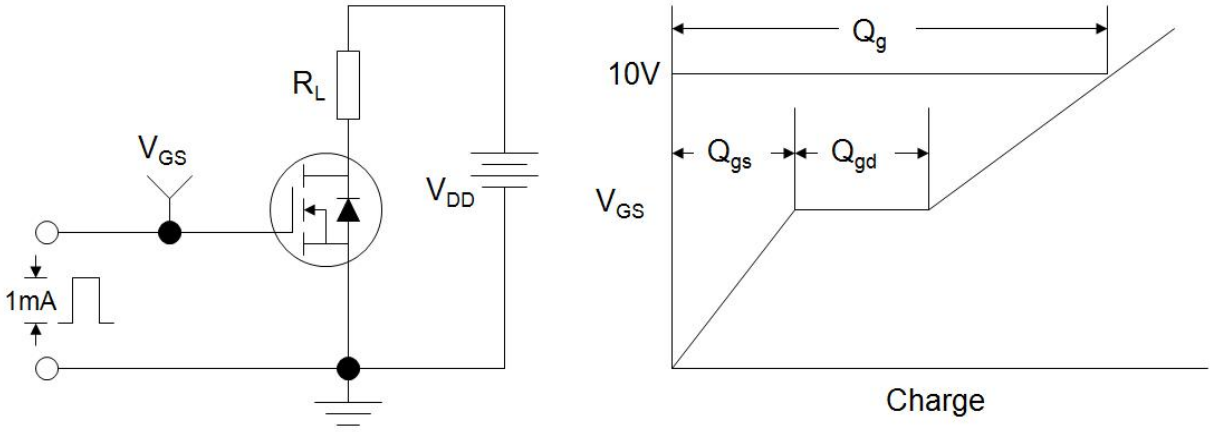


Figure B：Resistive Switching Test Circuit and Waveforms

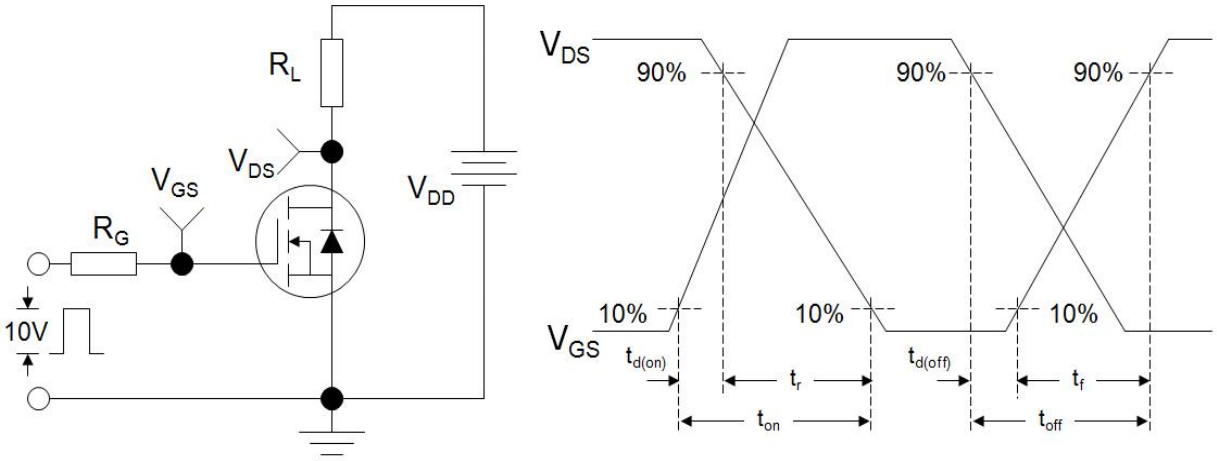
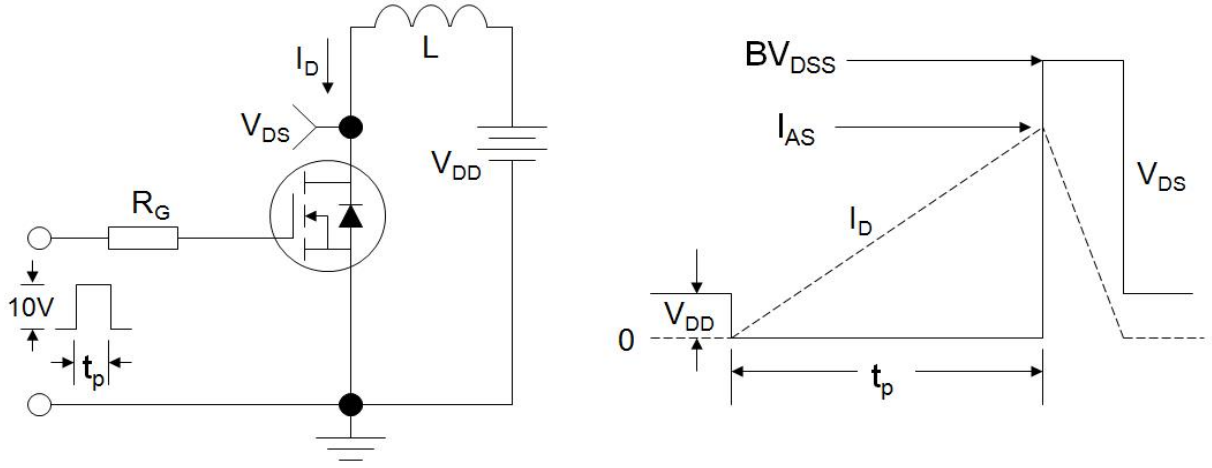
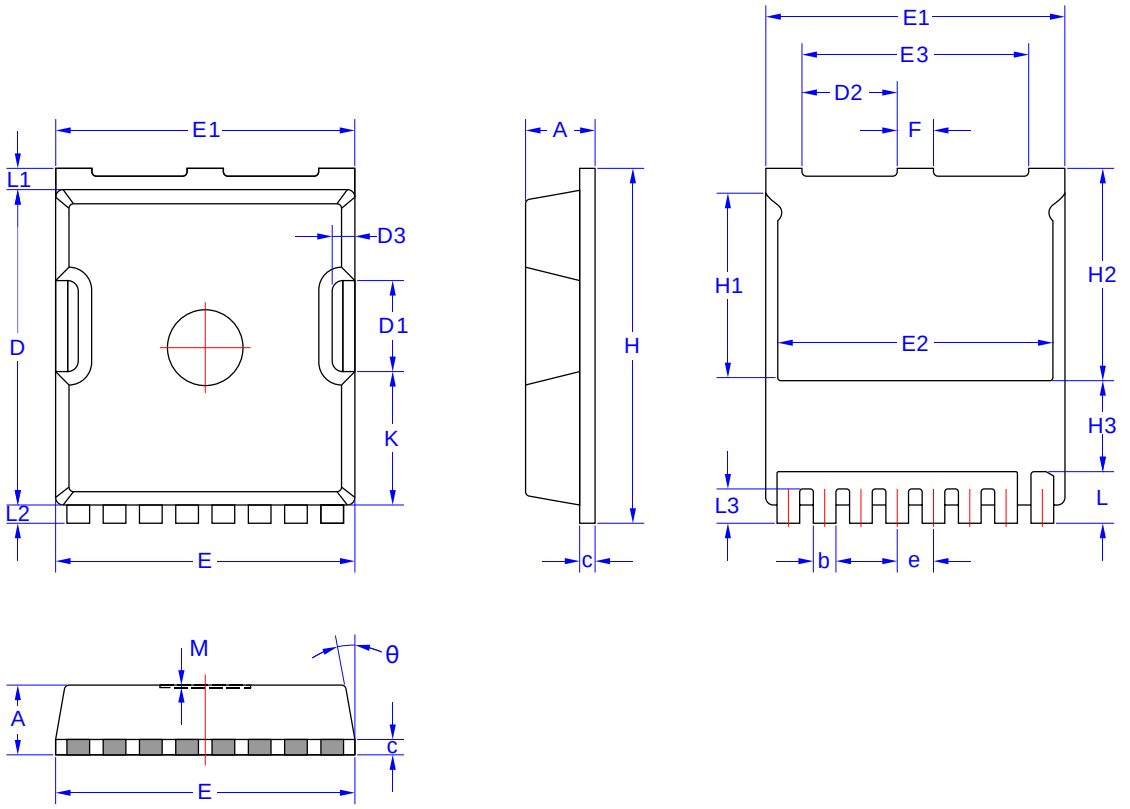


Figure C：Unclamped Inductive Switching (UIS) Test Circuit and Waveforms



8. Package Dimensions

TOLL-8L Package



Symbol	Dimensions in Millimeters		
	MIN.	NOM.	MAX.
A	2.20	2.30	2.40
b	0.65	0.75	0.85
c		0.508 REF	
D	10.25	10.40	10.55
D1	2.85	3.00	3.15
D2	2.95	3.10	3.25
D3		0.75 REF	
E	9.75	9.90	10.05
E1	9.65	9.80	9.95
E2	8.95	9.10	9.25
E3	7.25	7.40	7.55
e		1.20 BSC	

Symbol	Dimensions in Millimeters		
	MIN.	NOM.	MAX.
F	1.05	1.20	1.35
H	11.55	11.70	11.85
H1	6.03	6.18	6.33
H2	6.85	7.00	7.15
H3		3.00 BSC	
K	4.25	4.40	4.55
L	1.55	1.70	1.85
L1	0.55	0.70	0.85
L2	0.45	0.60	0.75
L3	1.00	1.15	1.30
M		0.08 REF	
θ	8°	10°	12°