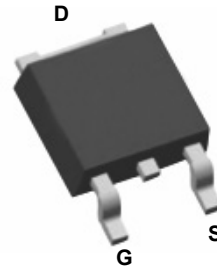
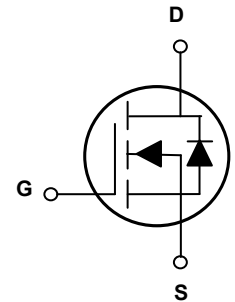


Main Product Characteristics

BV_{DSS}	700V
$R_{DS(ON)}$	390m Ω
I_D	11.5A



TO-252(DPAK)



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for high efficiency switched mode power supplies
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



Description

The GSJD7012 utilizes the latest techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supply and a wide variety of other applications.

Absolute Maximum Ratings ($T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage ($V_{GS}=0V$)	V_{DS}	700	V
Gate-Source Voltage ($V_{DS}=0V$), AC ($f>1$ Hz)	V_{GS}	± 30	V
Drain Current-Continuous ($T_C=25^\circ\text{C}$)	I_D	11.5	A
Drain Current-Continuous ($T_C=100^\circ\text{C}$)		7	
Drain Current-Pulsed ¹	I_{DM}	46	A
Single Pulse Avalanche Energy ²	E_{AS}	144	mJ
Repetitive Avalanche Energy, t_{AR} Limited by T_{Jmax} ¹	E_{AR}	0.5	mJ
Avalanche Current ¹	I_{AR}	6	A
Power Dissipation ($T_C=25^\circ\text{C}$)	P_D	101	W
Power Dissipation-Derate above 25°C		0.97	
Drain Source Voltage Slope, $V_{DS} \leq 480V$,	dv/dt	50	V/ns
Reverse Diode dv/dt , $V_{DS} \leq 480V, I_{SD} < I_D$	dv/dt	15	V/ns
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.24	$^\circ\text{C}/\text{W}$
Operating Junction Temperature Range	T_J	-55 To +150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 To +150	$^\circ\text{C}$

Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On/Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	700	-	-	V
Zero Gate Drain-Source Leakage Current	I_{DSS}	$V_{DS}=700V, V_{GS}=0V, T_C=25^\circ\text{C}$	-	0.05	1	μA
		$V_{DS}=700V, V_{GS}=0V, T_C=125^\circ\text{C}$	-	-	100	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=7A$	-	330	390	m Ω
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	3	3.5	4	V
Dynamic and Switching Characteristics						
Total Gate Charge	Q_g	$V_{DS}=480V, I_D=11.5A, V_{GS}=10V$	-	19	-	nC
Gate-Source Charge	Q_{gs}		-	6	-	
Gate-Drain Charge	Q_{gd}		-	6.5	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=420V, R_G=3\Omega, V_{GS}=10V, I_D=5.5A$	-	12	-	nS
Turn-On Rise Time	t_r		-	9	-	
Turn-Off Delay Time	$t_{d(off)}$		-	61	70	
Turn-Off Fall Time	t_f		-	11	14	
Input Capacitance	C_{iss}	$V_{DS}=50V, V_{GS}=0V, F=1\text{MHz}$	-	870	-	pF
Output Capacitance	C_{oss}		-	54	-	
Reverse Transfer Capacitance	C_{rss}		-	1.8	-	
Source- Drain Diode Characteristics						
Source-Drain Current (Body Diode)	I_{SD}	$T_C=25^\circ\text{C}$	-	-	11.5	A
Pulsed Source-Drain Current (Body Diode)	I_{SDM}		-	-	46	A
Forward On Voltage	V_{SD}	$V_{GS}=0V, I_{SD}=11.5A, T_J=25^\circ\text{C}$	-	0.9	1.2	V
Reverse Recovery Time	t_{rr}	$I_F=5.8A, di/dt=100A/\mu s, T_J=25^\circ\text{C}$	-	220	-	nS
Reverse Recovery Charge	Q_{rr}		-	2.2	-	μC
Peak Reverse Recovery Current	I_{rrm}		-	19	-	A

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. $V_{DD}=50V, V_G=10V, R_G=25\Omega$, starting $T_J=25^\circ\text{C}$.

Typical Electrical and Thermal Characteristic Curves

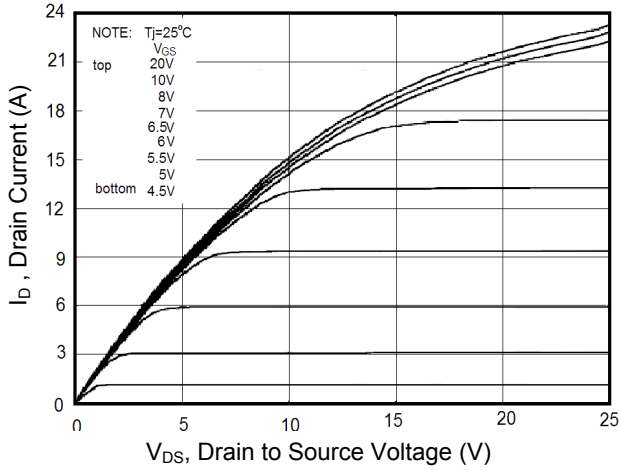


Figure 1. Output Characteristics

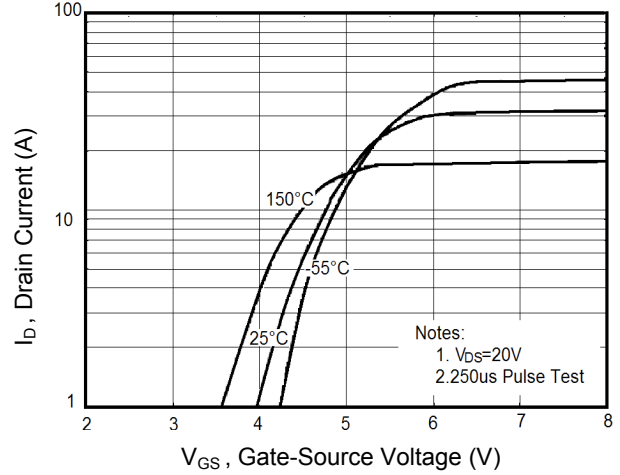


Figure 2. Transfer Characteristics

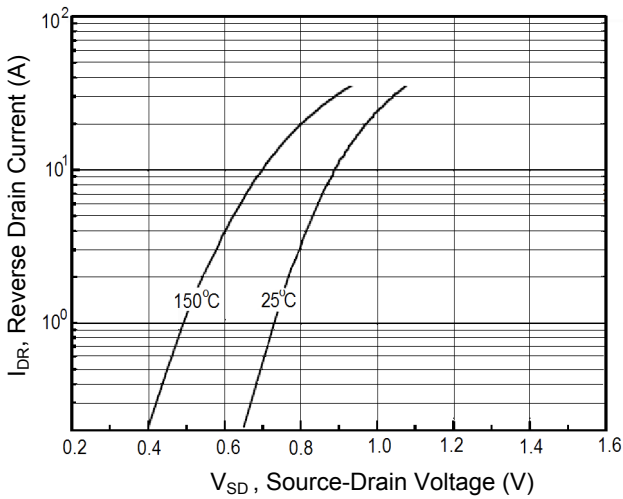


Figure 3. Source-Drain Diode Forward Voltage

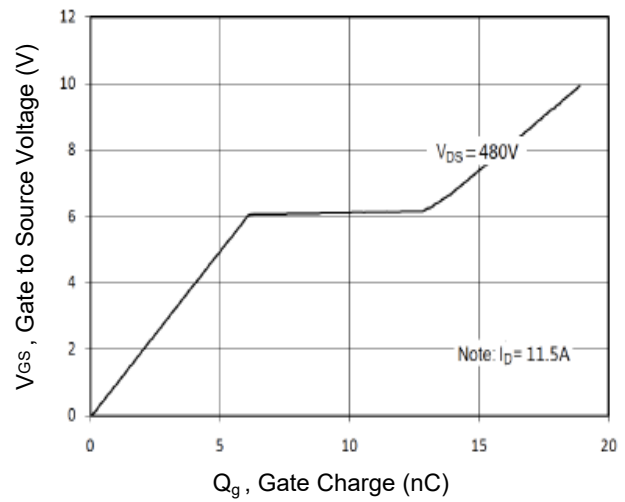


Figure 4. Gate Charge Waveform

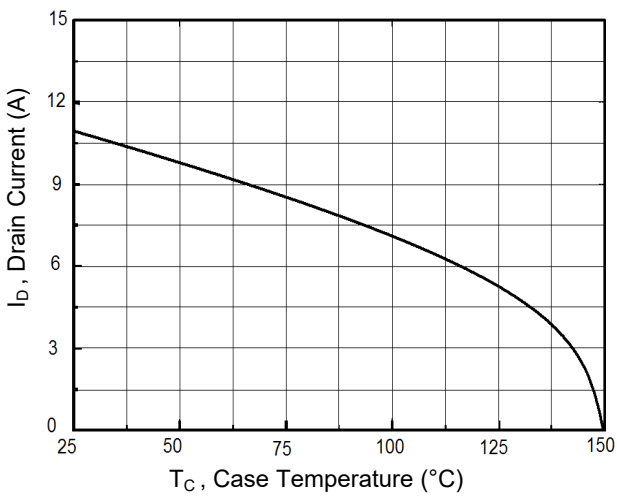


Figure 5. Drain Current vs. T_c

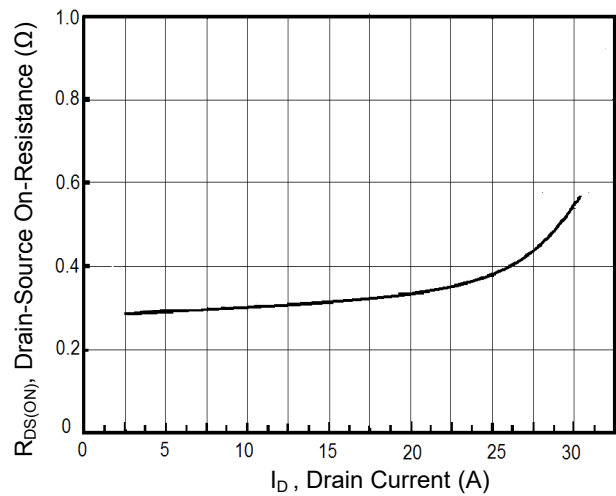


Figure 6. Static Drain-source on Resistance

Typical Electrical and Thermal Characteristic Curves

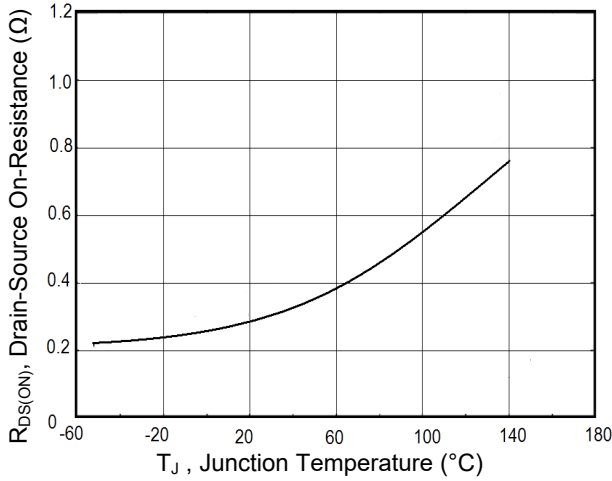


Figure 7. $R_{DS(ON)}$ vs Junction Temperature

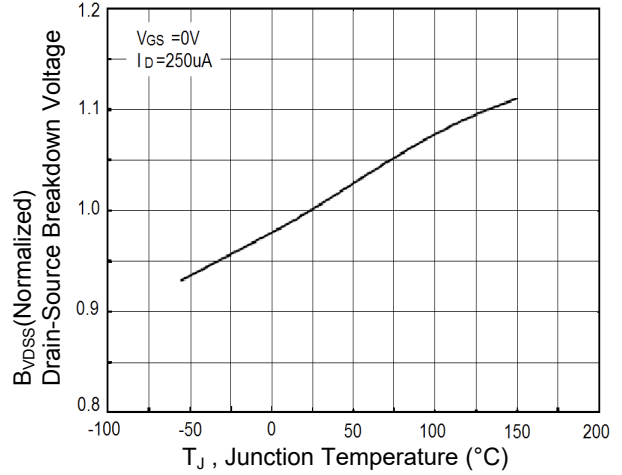


Figure 8. BV_{DSS} vs Junction Temperature

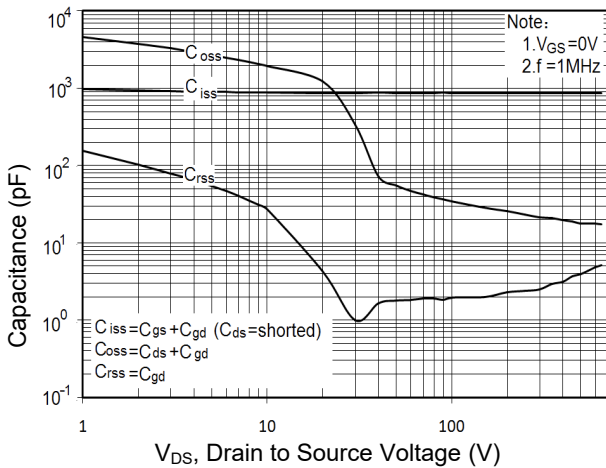


Figure 9. Capacitance

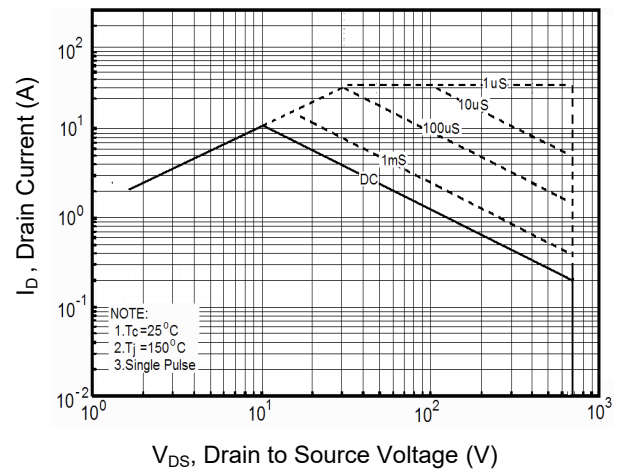


Figure 10. Safe Operation Area

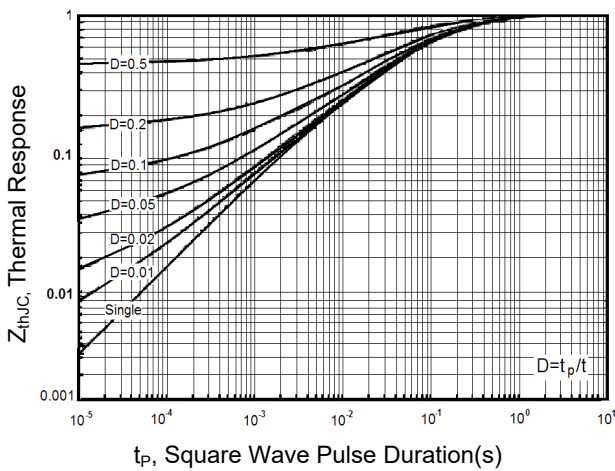


Figure 11. Transient Thermal Impedance

Typical Electrical and Thermal Characteristic Curves

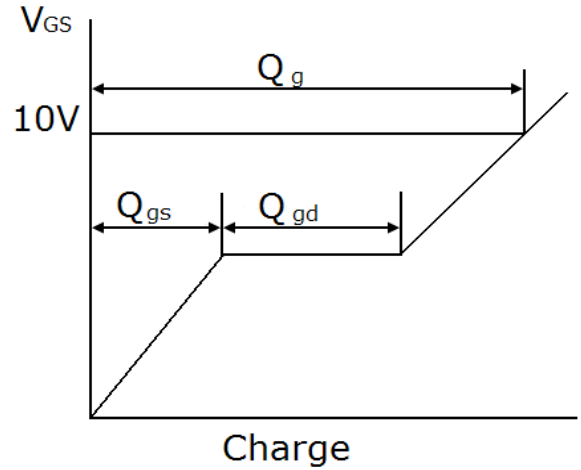
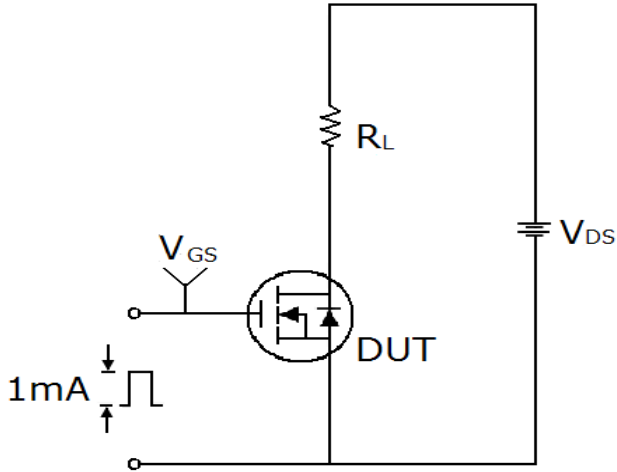


Figure 12. Gate Charge Test Circuit & Waveform

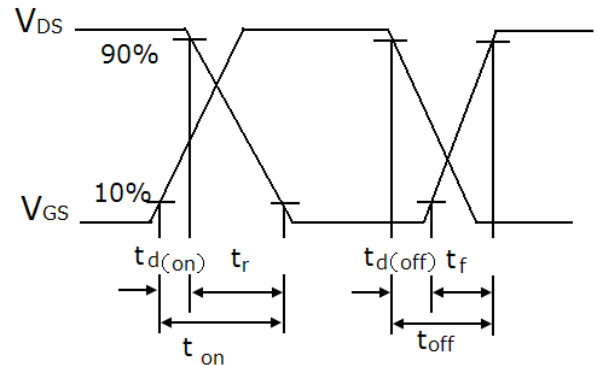
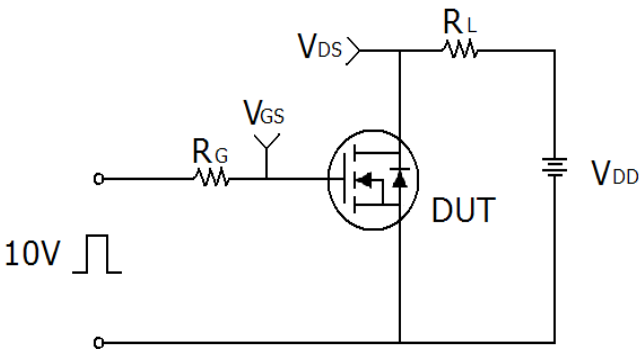


Figure 13. Switching Time Waveform

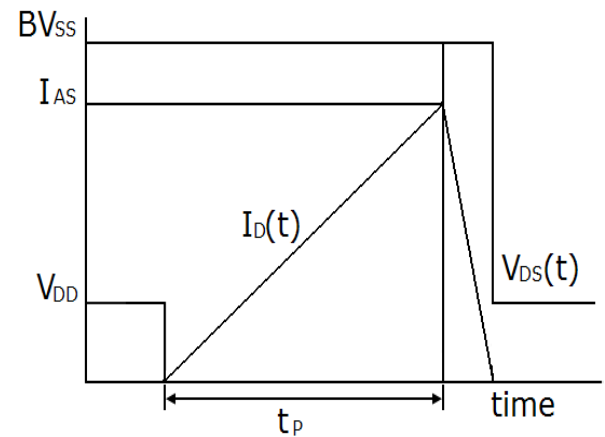
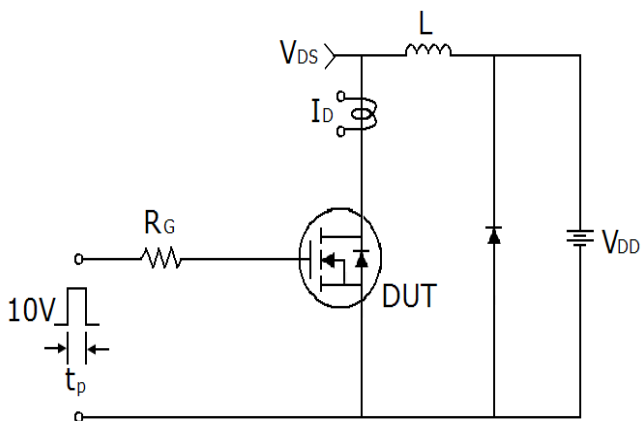
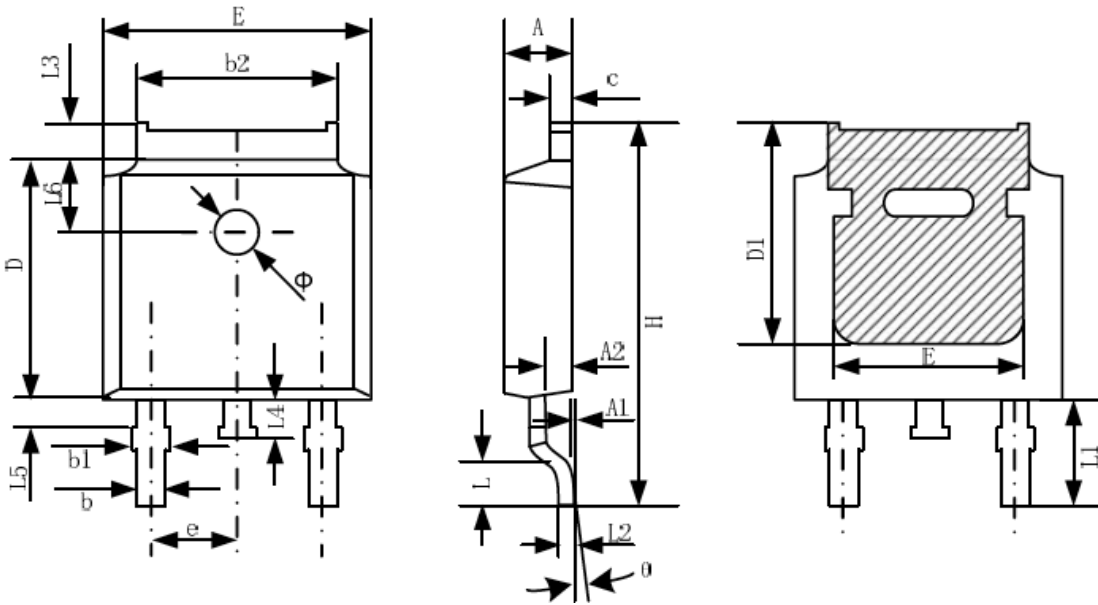


Figure 14. Unclamped Inductive Switching Test Circuit & Waveforms

Package Outline Dimensions TO-252(DPAK)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.20	2.38	0.087	0.094
A1	0.00	0.10	0.000	0.004
A2	0.90	1.10	0.035	0.043
b	0.72	0.85	0.028	0.033
b1	0.72	0.90	0.028	0.035
b2	5.13	5.46	0.202	0.215
c	0.47	0.60	0.019	0.024
D	6.00	6.20	0.236	0.244
D1	5.25	-	0.207	-
E	6.50	6.70	0.256	0.264
E1	4.70	-	0.185	-
e	2.19	2.39	0.086	0.094
H	9.80	10.40	0.386	0.409
L	1.40	1.70	0.055	0.067
L1	2.90 REF		0.114 REF	
L2	0.508 BSC		0.020 BSC	
L3	0.90	1.25	0.035	0.049
L4	0.60	1.00	0.024	0.039
L5	0.15	0.75	0.006	0.030
L6	1.80 REF		0.071 REF	
Φ	1.20	1.40	0.047	0.055
θ	0°	8°	0°	8°