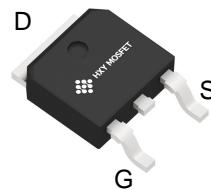




## Description

The PJD5NA50\_L2\_00001 can be used in various power switching circuit for system miniaturization and higher efficiency. The package form is TO-252-2L, which accords with the RoHS standard.



TO-252-2L

## General Features

$V_{DS} = 500V$   $I_D = 5A$

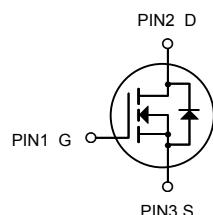
$R_{DS(ON)} < 1.3\Omega$  @  $V_{GS}=10V$

## Application

PWM Application

Load switch

Power Management



N-Channel MOSFET

## Ordering Information

Product ID	Pack	Brand	Qty(PCS)
PJD5NA50_L2_00001	TO-252-2L	HXY MOSFET	2500

## Absolute Maximum Ratings ( $T_c=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	500	V
$V_{GS}$	Gate-Source Voltage	$\pm 30$	V
$I_D@T_c=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	5	A
$I_D@T_c=100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	3	A
$I_{DM}$	Pulsed Drain Current	20	A
EAS	Single Pulse Avalanche Energy	137	mJ
$P_D@T_c=25^\circ C$	Total Power Dissipation	83	W
$T_{STG}$	Storage Temperature Range	-55 to 150	°C
$T_J$	Operating Junction Temperature Range	-55 to 150	°C
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	33	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case	1.5	°C/W



**Electrical Characteristics (T<sub>J</sub>=25°C, unless otherwise noted)**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	I <sub>D</sub> = 250μA, V <sub>GS</sub> = 0V	500	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = 500V, V <sub>GS</sub> = 0V	-	-	1.0	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±30V	-	-	±100	nA
<b>On Characteristics</b>						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	2	3.4	3.6	V
R <sub>DS(ON)</sub>	Static Drain-Source ON-Resistance <sup>(4)</sup>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 2.5A	-	1.30	1.50	Ω
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 25V, f = 1MHz	-	582	-	pF
C <sub>oss</sub>	Output Capacitance		-	42	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	4	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> = 0 to 10V V <sub>DS</sub> = 250V, I <sub>D</sub> = 2A	-	14	-	nC
Q <sub>gs</sub>	Gate Source Charge		-	3.3	-	nC
Q <sub>gd</sub>	Gate Drain("Miller") Charge		-	4	-	nC
<b>Switching Characteristics</b>						
t <sub>d(on)</sub>	Turn-On Delay Time	V <sub>GS</sub> = 10V, V <sub>DD</sub> = 240V I <sub>D</sub> = 2A, R <sub>GEN</sub> = 24Ω	-	12	-	ns
t <sub>r</sub>	Turn-On Rise Time		-	17	-	ns
t <sub>d(off)</sub>	Turn-Off Delay Time		-	45	-	ns
t <sub>f</sub>	Turn-Off Fall Time		-	25	-	ns
<b>Drain-Source Diode Characteristics and Max Ratings</b>						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current	V <sub>GS</sub> = 0V, I <sub>S</sub> = 5A	-	-	5	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	20	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	I <sub>F</sub> = 5A, di/dt = 100A/us	-	-	1.2	V
trr	Body Diode Reverse Recovery Time		-	340	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	2.9	-	μC

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

2. E<sub>AS</sub> condition: Starting T<sub>J</sub>=25C, V<sub>DD</sub>=50V, V<sub>G</sub>=10V, R<sub>G</sub>=25ohm, L=10mH, I<sub>AS</sub>=5.3A

3. R<sub>0JA</sub> is measured with the device mounted on a minimum recommended pad of 2oz copper FR4 PCB

4. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.



## Typical Characteristics

Figure 1: Output Characteristics

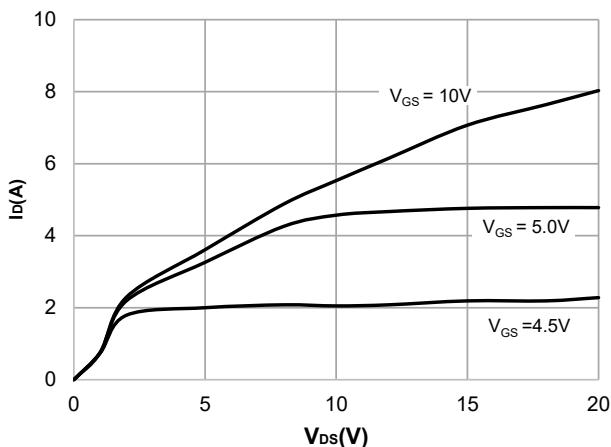


Figure 2: Typical Transfer Characteristics

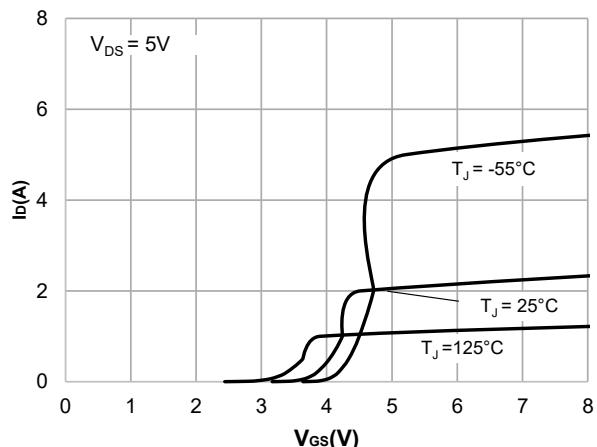


Figure 3: On-resistance vs. Drain Current

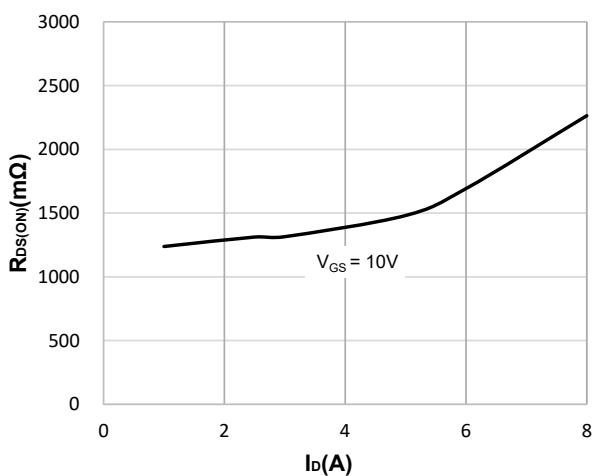


Figure 4: Body Diode Characteristics

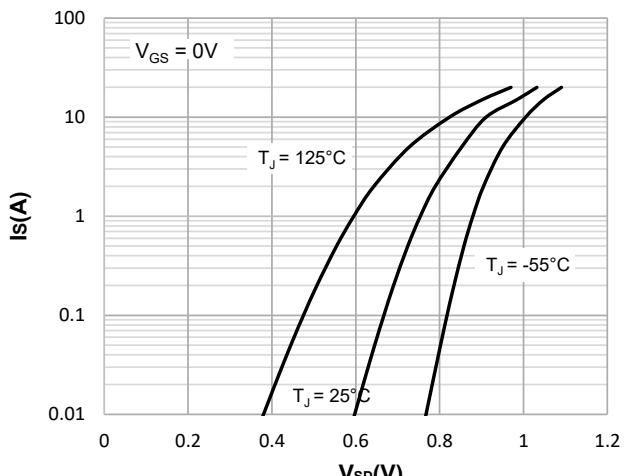


Figure 5: Gate Charge Characteristics

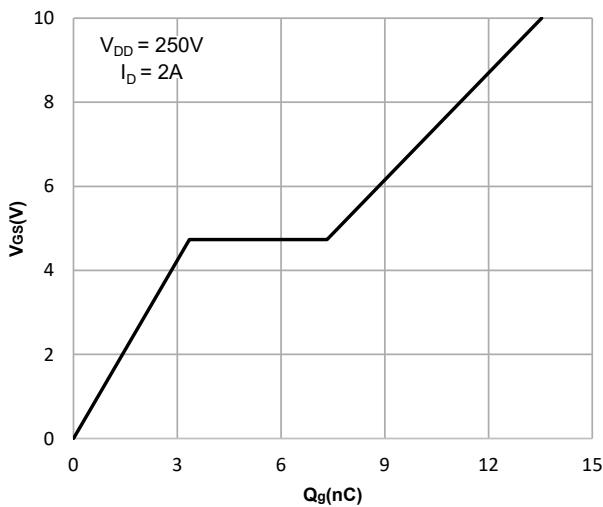


Figure 6: Capacitance Characteristics

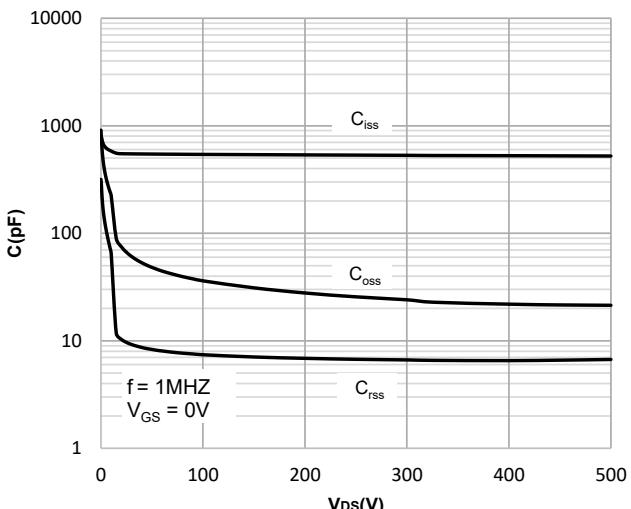




Figure 7: Normalized Breakdown voltage vs. Junction Temperature

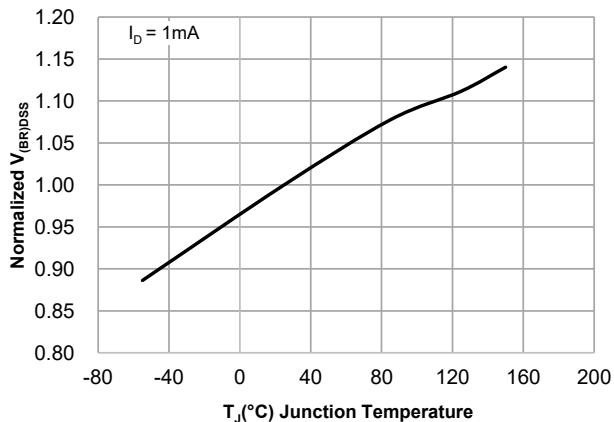


Figure 8: Normalized on Resistance vs. Junction Temperature

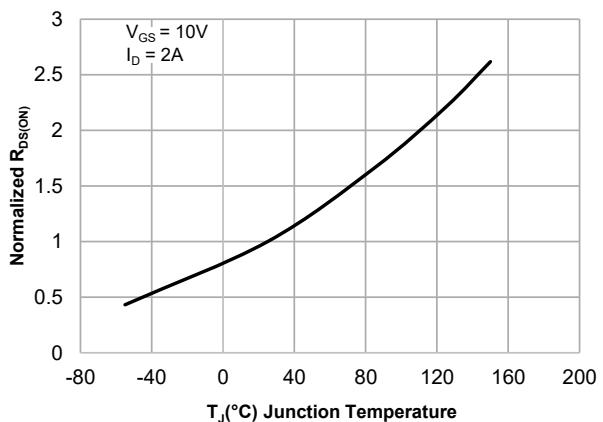


Figure 9: Maximum Safe Operating Area

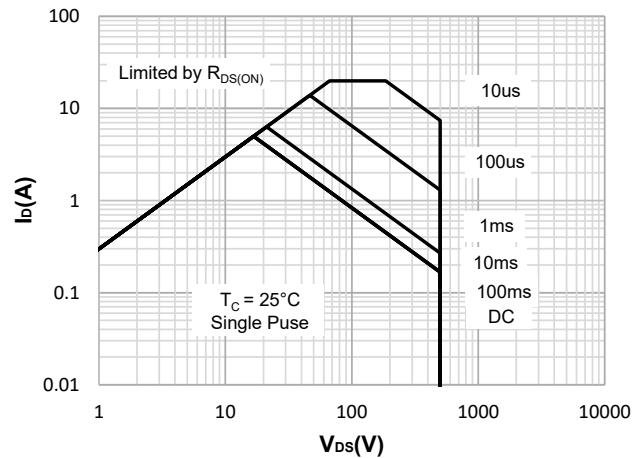


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

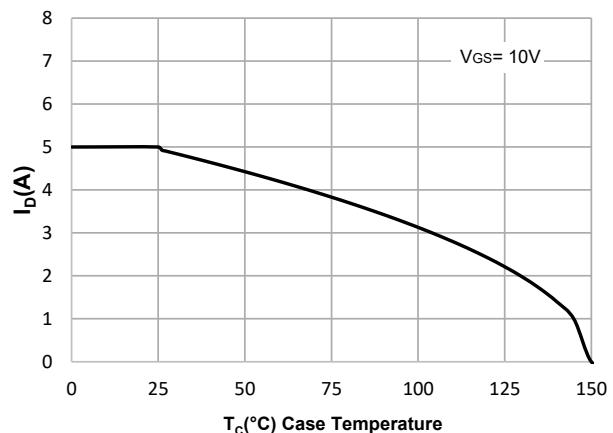


Figure 11: Normalized Maximum Transient Thermal Impedance

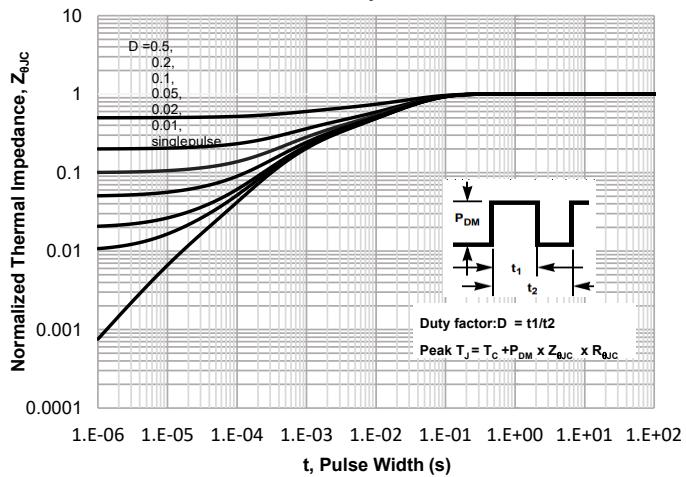
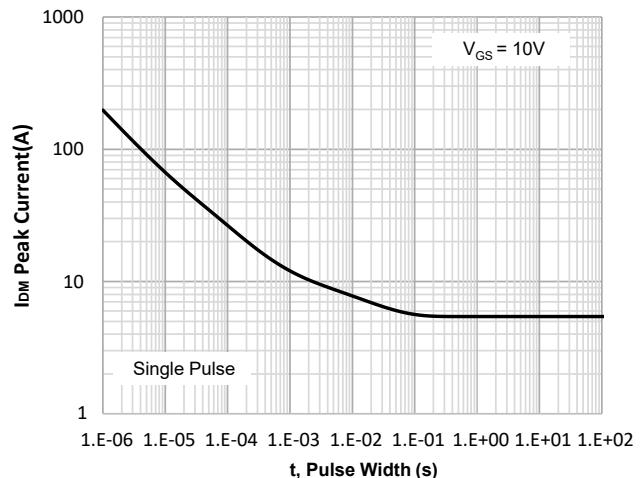


Figure 12: Peak Current Capacity





## Test Circuit

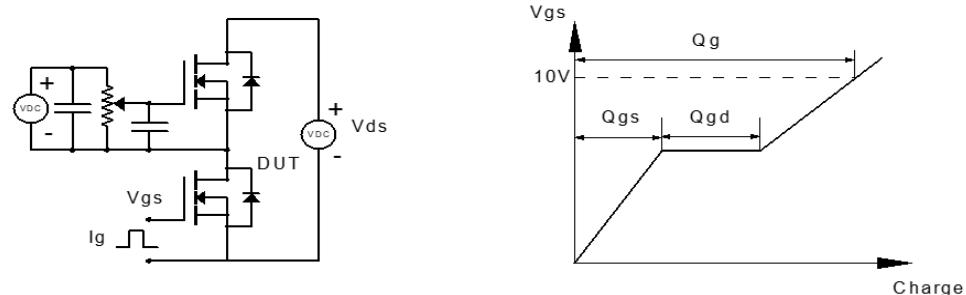


Figure 1: Gate Charge Test Circuit & Waveform

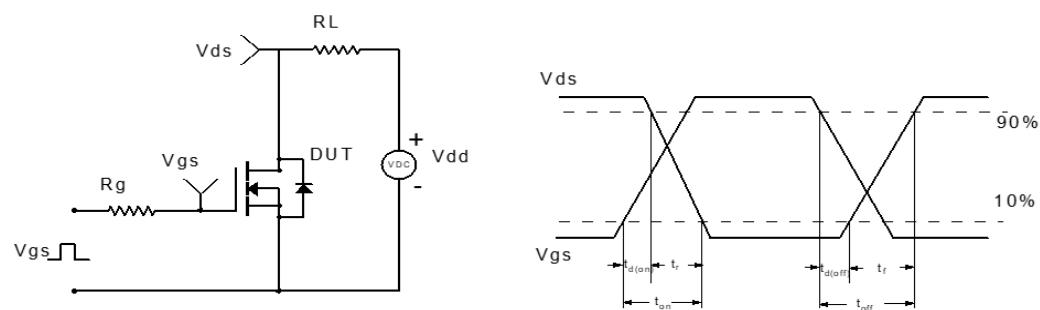


Figure 2: Resistive Switching Test Circuit & Waveform

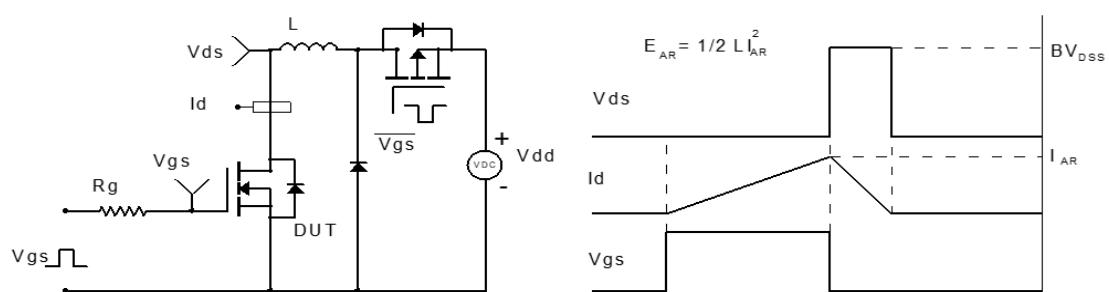


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

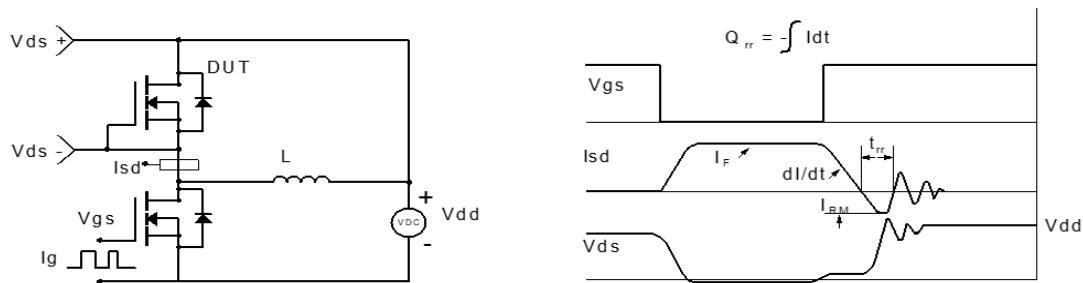
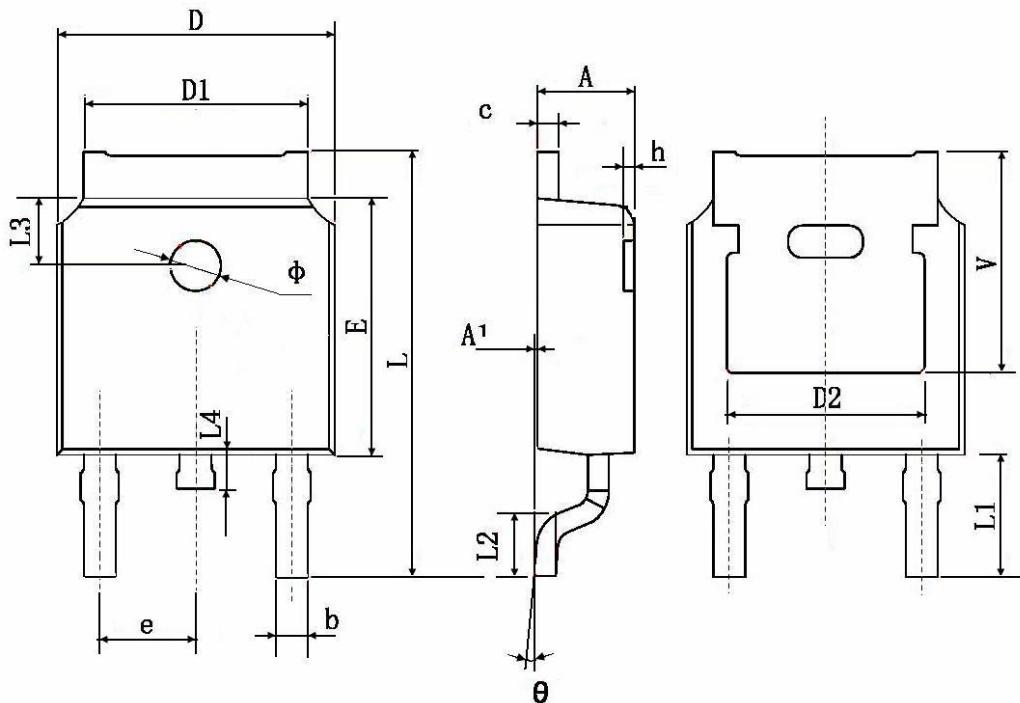


Figure 4: Diode Recovery Test Circuit & Waveform



## TO-252-2L Package Information



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	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	0.483 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	



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