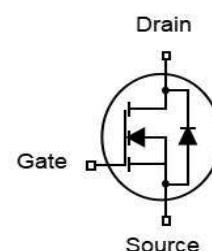


## Features

- N-Channel
- Low gate Charge
- Low reverse transfer capacitance
- Fast switching capability
- Improved dv/dt capability
- 100% EAS Tested

$V_{DS}$	70	V
$R_{DS(on),TYP}@ V_{GS}=10V$	7	m $\Omega$
$I_D$	80	A

### TO-252



Part ID	Package Type	Marking	Packing
ZT070N07D	TO-252	ZT070N07D	2500pcs/reel

### Absolute Maximum Ratings $T_A=25^\circ\text{C}$ , unless otherwise specified

Symbol	Parameter	Rating	Unit	
<b>Common Ratings (<math>T_C=25^\circ\text{C}</math> Unless Otherwise Noted)</b>				
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V	
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	70	V	
$T_J$	Maximum Junction Temperature	150	$^\circ\text{C}$	
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$	
$I_{DM}$	Drain Current-Continuous@ Current-Pulsed	$T_C=25^\circ\text{C}$ 320	A	
<b>Mounted on Large Heat Sink</b>				
$I_D$	Drain Current-Continuous	$T_C=25^\circ\text{C}$	80	A
		$T_C=100^\circ\text{C}$	56	A
$P_D$	Maximum Power Dissipation	125	W	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	1.0	$^\circ\text{C/W}$	
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62.5	$^\circ\text{C/W}$	
<b>Drain-Source Avalanche Ratings</b>				
EAS	Avalanche Energy, Single Pulsed (Note 1)	196	mJ	

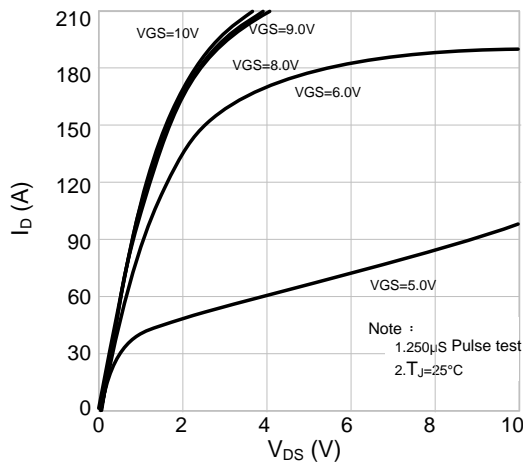
**Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)**

Symbol	Parameter	Condition	Min	Typ	Max	Unit
<b>Static Electrical Characteristics @ T<sub>J</sub>=25°C (unless otherwise stated)</b>						
V(BR)DSS	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	70	--	--	V
IDSS	Zero Gate Voltage Drain Current	V <sub>DS</sub> =70V, V <sub>GS</sub> =0V	--	--	1	μA
IGSS	Gate-Body Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2.0	--	4.0	V
RDS(on)	Drain-Source On-State Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =40A	--	7.0	9.0	mΩ
<b>Dynamic Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
Ciss	Input Capacitance	V <sub>DS</sub> =35V, V <sub>GS</sub> =0V, f=1MHz	--	2812	--	pF
Coss	Output Capacitance		--	198	--	pF
Crss	Reverse Transfer Capacitance		--	132	--	pF
Rg	Gate Resistance	f=1MHz	--	4.5	--	Ω
Qg	Total Gate Charge	V <sub>DD</sub> =56V, I <sub>D</sub> =40A, V <sub>GS</sub> =10V	--	53	--	nC
Qgs	Gate-Source Charge		--	15	--	nC
Qgd	Gate-Drain Charge		--	15	--	nC
Vplateau	Gate plateau voltage		--	5.4	--	V
<b>Switching Characteristics (Note 2)</b>						
Td(on)	Turn-on Delay Time	V <sub>DD</sub> =35V, I <sub>D</sub> =40A, R <sub>G</sub> =4.7Ω, V <sub>GS</sub> =10V	--	14	--	ns
Tr	Turn-on Rise Time		--	40	--	ns
Td(off)	Turn-Off Delay Time		--	55	--	ns
Tf	Turn-Off Fall Time		--	20	--	ns
<b>Source- Drain Diode Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
IS	Diode Forward Current (Note 3)		--	--	80	A
VSD	Forward on voltage	I <sub>S</sub> =40A, V <sub>GS</sub> =0V	--	--	1.4	V
Trr	Reverse Recovery Time	T <sub>J</sub> =25°C, I <sub>S</sub> =40A, V <sub>GS</sub> =0V, di/dt=100A/μs	--	21	--	ns
Qrr	Reverse Recovery Charge		--	0.02	--	μC
I <sub>RRM</sub>	Peak Reverse Recovery Current		--	1.8	--	A

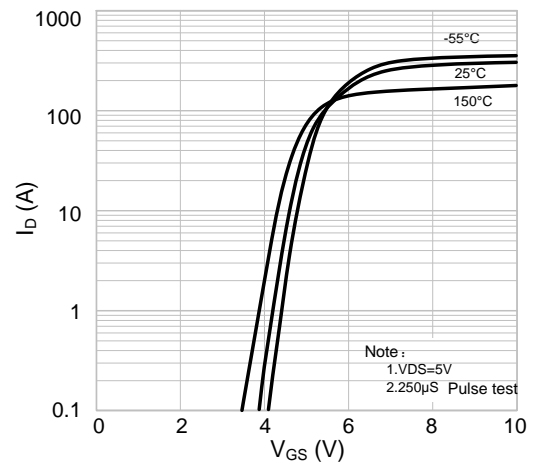
**Notes:**

1. L=0.5mH, I<sub>AS</sub>=28A, R<sub>G</sub>=25Ω, V<sub>DD</sub>=56V, Start T<sub>J</sub>=25°C.
2. Pulse test: pulse width ≤ 300μs, Duty Cycle ≤ 2%.
3. Basically not affected by the operating temperature.

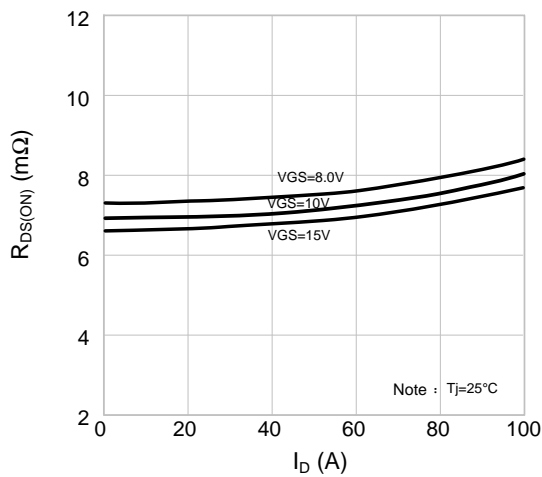
**Typical Characteristics**  $T_J = 25^\circ\text{C}$ , unless otherwise noted



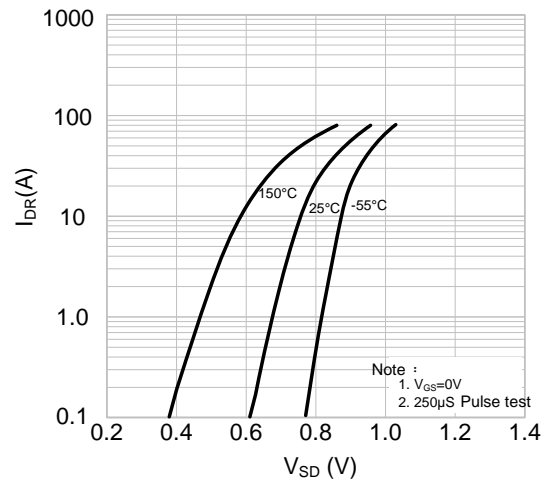
**Figure 1 Output Characteristics**



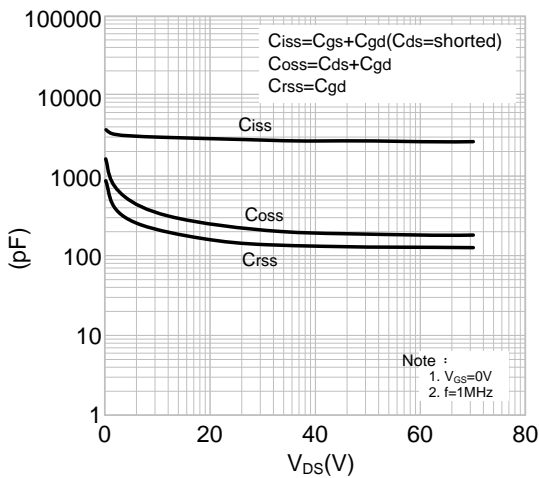
**Figure 4 Transfer Characteristics**



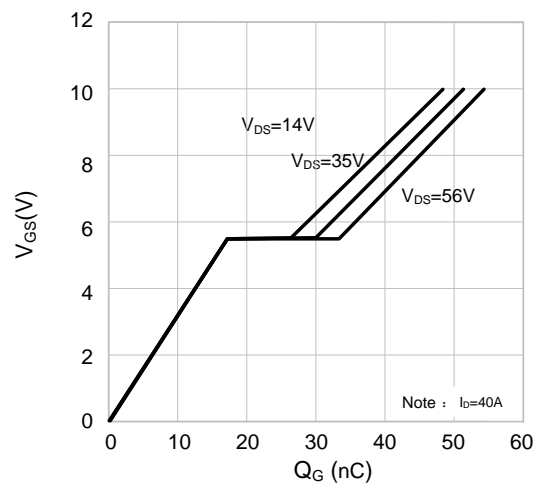
**Figure 2 Rdson VS Drain Current**



**Figure 5 Body Diode Forward Voltage Drop VS Source Current and Temperature**



**Figure 3 Capacitance vs Vds**



**Figure 6 Gate Charge**

Typical Characteristics  $T_J = 25^\circ\text{C}$ , unless otherwise noted

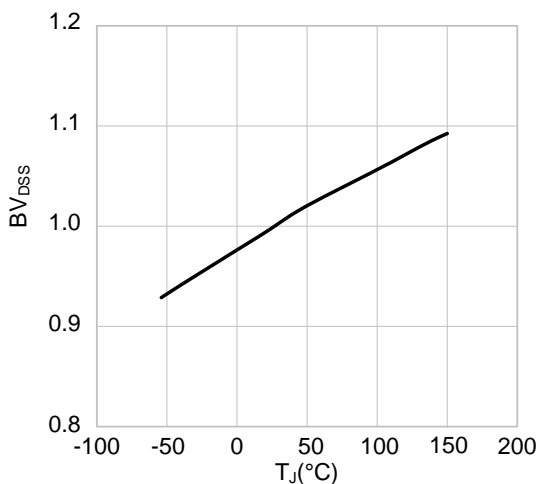


Figure 7 Breakdown Voltage VS Temperature Characteristic

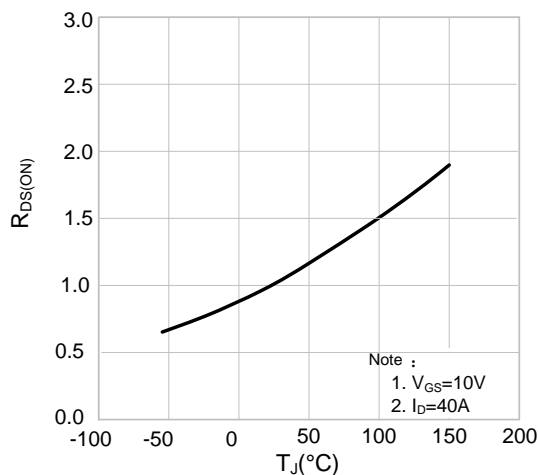


Figure 10  $R_{DS(on)}$  VS Temperature Characteristic

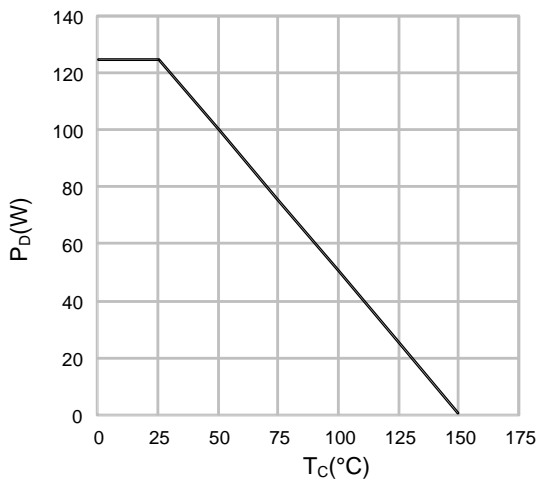


Figure 8 Power Dissipation VS Case Temperature

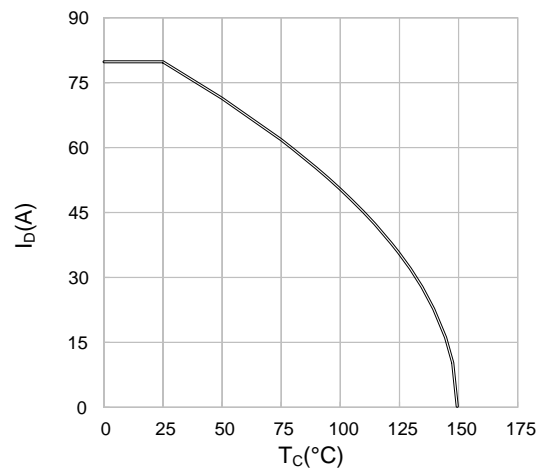


Figure 11 Drain Current VS Case Temperature

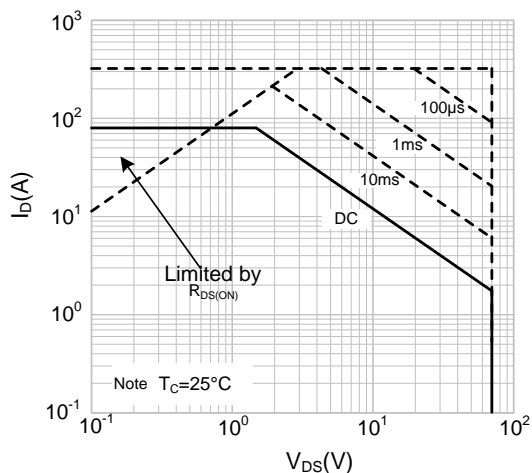


Figure 9 Safe Operation Area

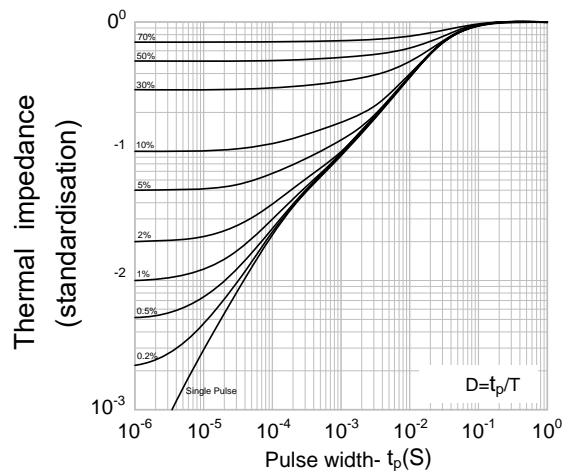
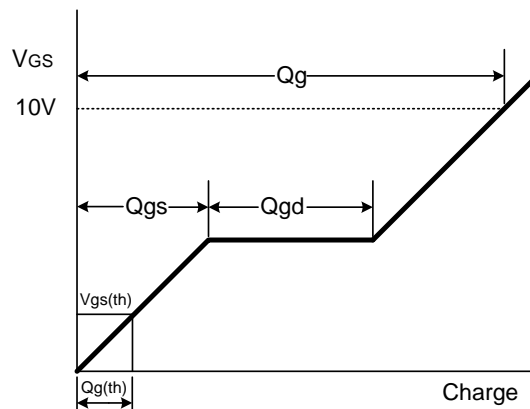
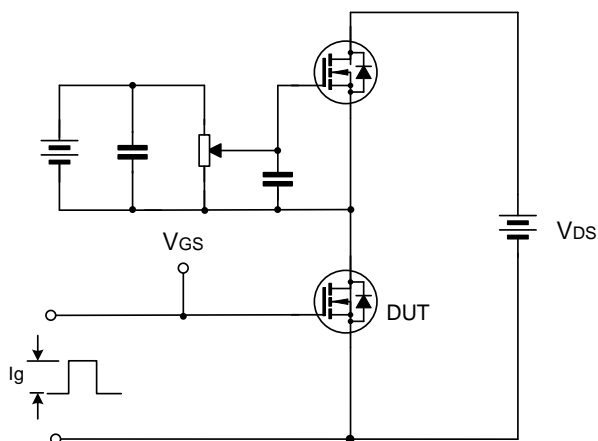
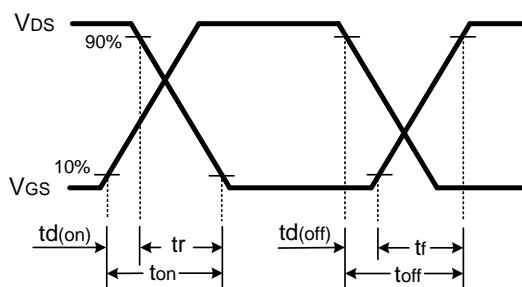
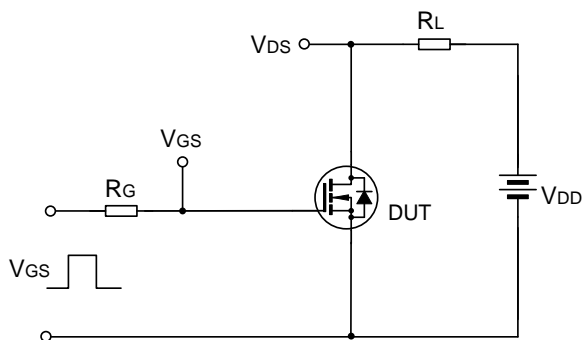


Figure 12 Transient Heat Value Reactance VS Pulse Width

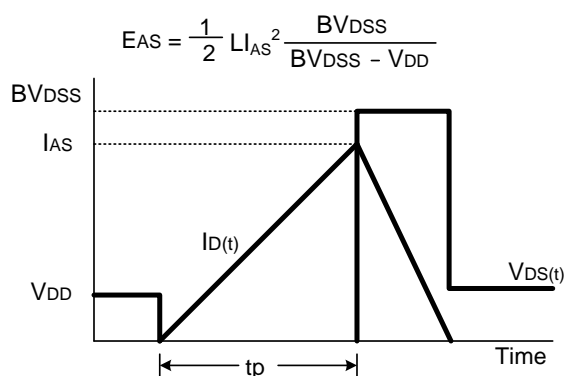
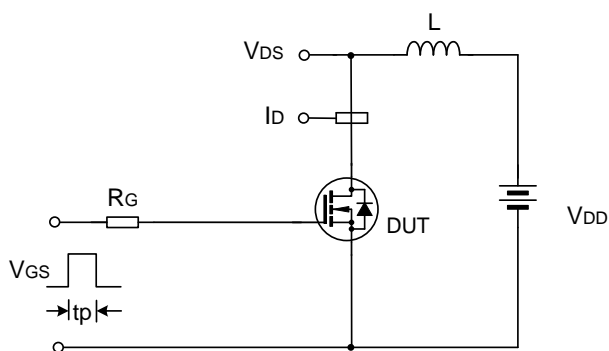
## Test Circuit and Waveform



Gate Charge Test Circuit & Waveform

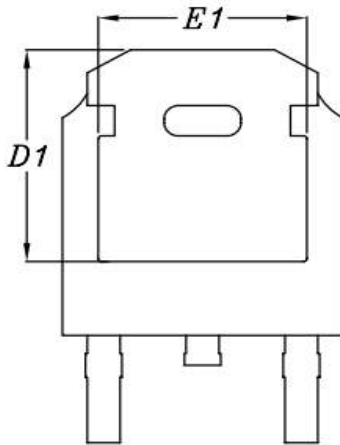
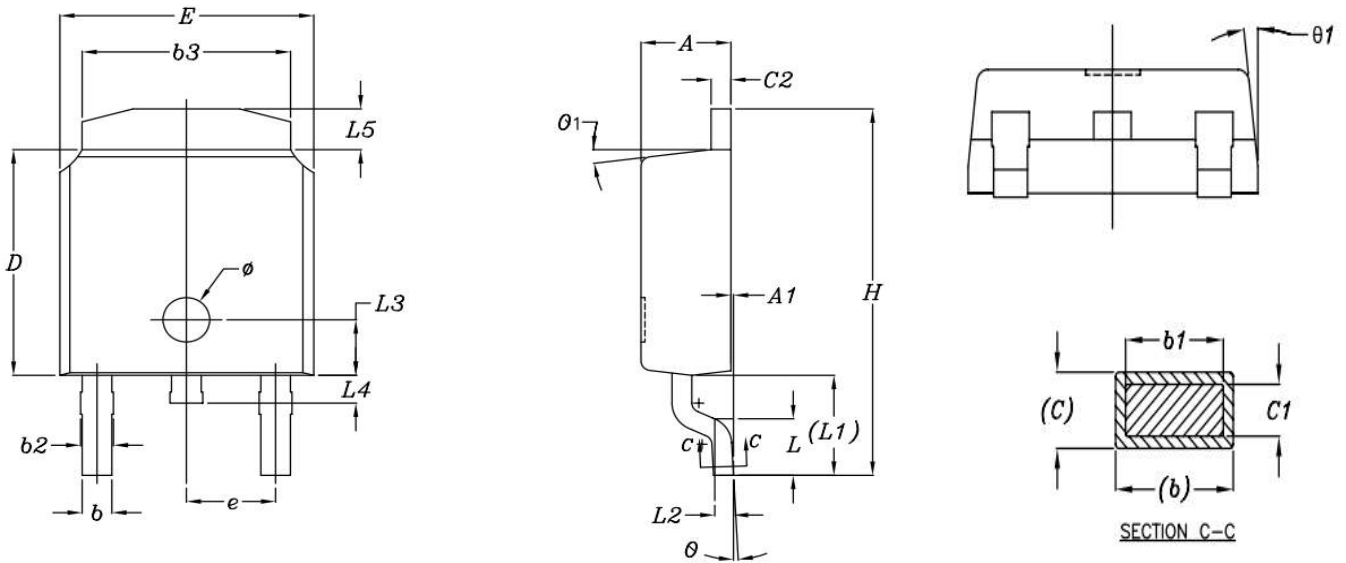


Resistive Switching Test Circuit & Waveforms

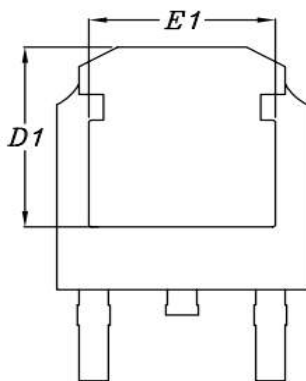


Unclamped Inductive Switching Circuit & Waveforms

## TO-252 Package Information



Option(1)  
Standard PAD



Option(2)  
Large PAD

I T E M	DIMENSIONS			
	MILLMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.18	2.39	0.086	0.094
A1	—	0.13	—	0.005
b	0.70	0.89	0.028	0.035
b1	0.70	0.86	0.028	0.034
b2	0.76	1.14	0.030	0.045
b3	4.95	5.46	0.195	0.215
c	0.46	0.61	0.018	0.024
c1	0.41	0.56	0.016	0.022
c2	0.46	0.89	0.018	0.035
D	5.97	6.22	0.235	0.245
D1	5.21	—	0.205	—
E	6.35	6.73	0.250	0.265
E1	4.32	—	0.170	—
e	2.29 BSC		0.090 BSC	
H	9.40	10.41	0.370	0.410
L	1.40	1.78	0.055	0.070
L1	2.60	2.90	0.102	0.114
L2	0.51 BSC		0.020 BSC	
L3	1.65	1.95	0.065	0.077
L4	0.60	0.90	0.024	0.035
L5	0.89	1.27	0.035	0.050
∅	1*	5*	1*	5*
∅1	7* REF		7* REF	
∅	1.20 REF		1.20 REF	

## Customer Service

Sales and Service:

[zj@ztasemi.com](mailto:zj@ztasemi.com)