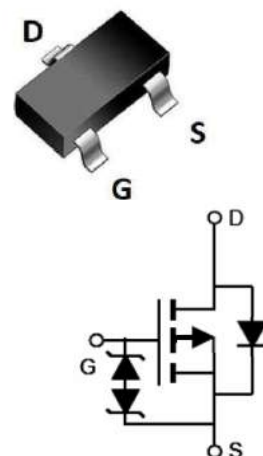


Features

- P-Channel
- Good stability and uniformity
- 100% avalanche tested
- Excellent package for good heat dissipation
- ESD protected

V_{DS}	-20	V
$R_{DS(on),TYP@ V_{GS}=-4.5V}$	30	m Ω
$R_{DS(on),TYP@ V_{GS}=-2.5V}$	36	m Ω
I_D	-4.5	A

SOT-23


Part ID	Package Type	Marking	Packing
ZT3415	SOT-23	3415	3000pcs/Reel

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

Symbol	Parameter	Rating	Unit	
Common Ratings ($T_C=25^\circ\text{C}$ Unless Otherwise Noted)				
V_{GS}	Gate-Source Voltage	± 12	V	
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	-20	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 (Note 1)	$T_C = 25^\circ\text{C}$ -18	A	
Mounted on Large Heat Sink				
I_D	Drain Current-Continuous	$T_C = 25^\circ\text{C}$	-4.2	A
		$T_C = 100^\circ\text{C}$	-2.9	A
ESD	HBM	2000	V	
P_D	Maximum Power Dissipation - Derate above 25°C	$T_C = 25^\circ\text{C}$	1.2	W
		$T_C = 25^\circ\text{C}$	0.53	W/ $^\circ\text{C}$
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	101	$^\circ\text{C/W}$	

Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T_J=25°C (unless otherwise stated)						
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	-20	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-20V, V _{GS} =0V	--	--	-1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±8V, V _{DS} =0V	--	--	±10	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-0.5	-0.7	-0.9	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =-4.5V, I _D =-5A	--	30	38	mΩ
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =-2.5V, I _D =-4A	--	36	49	mΩ
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =-1.8V, I _D =-2A	--	47	65	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated) (Note 3, 4)						
C _{iss}	Input Capacitance	V _{DS} =-10V, V _{GS} =0V, f=1MHz	--	902	--	pF
C _{oss}	Output Capacitance		--	156	--	pF
C _{rss}	Reverse Transfer Capacitance		--	114	--	pF
Q _g	Total Gate Charge	V _{DS} =-10V, I _D =-4A, V _{GS} =-4.5V	--	11.4	--	nC
Q _{gs}	Gate-Source Charge		--	1.3	--	nC
Q _{gd}	Gate-Drain Charge		--	3.4	--	nC
Switching Characteristics (Note 3, 4)						
T _{d(on)}	Turn-on Delay Time	V _{DS} =-10V, I _D =-2A, R _L =2.5Ω, R _G =3Ω, V _{GS} =-4.5V	--	11	--	ns
T _r	Turn-on Rise Time		--	9	--	ns
T _{d(off)}	Turn-Off Delay Time		--	18	--	ns
T _f	Turn-Off Fall Time		--	23	--	ns
Source- Drain Diode Characteristics @ T_J = 25°C (unless otherwise stated)						
I _{SD}	Source-Drain Current (Body Diode)		--	--	-4.5	A
I _{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	-18	A
V _{SD}	Forward on voltage	I _S =-4.0A, V _{GS} =0V	--	--	-1.2	V

Notes:

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. I_{SD} ≤ -4A, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Staring T_J = 25°C
3. Pulse Test : Pulse width ≤ 300us, Duty cycle ≤ 2%
4. Essentially independent of operating temperature

P- Channel Typical Characteristics

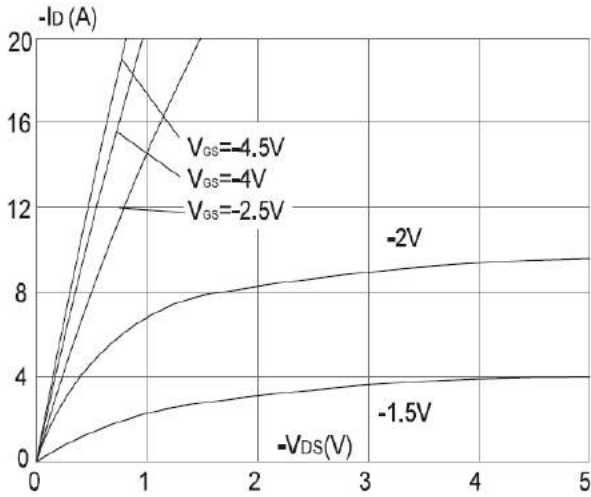


Fig.1 Output Characteristics

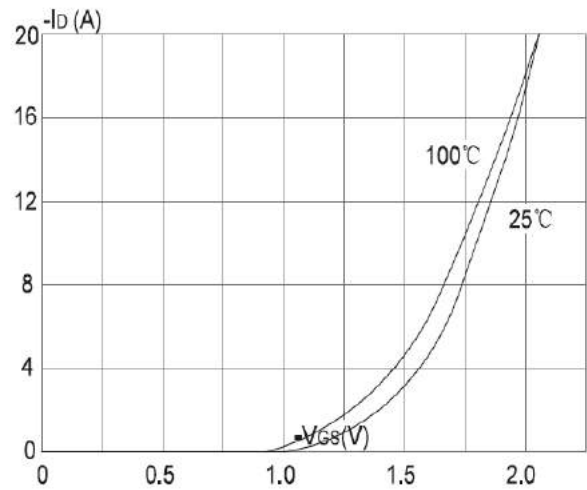


Fig.4 Typical Transfer Characteristics

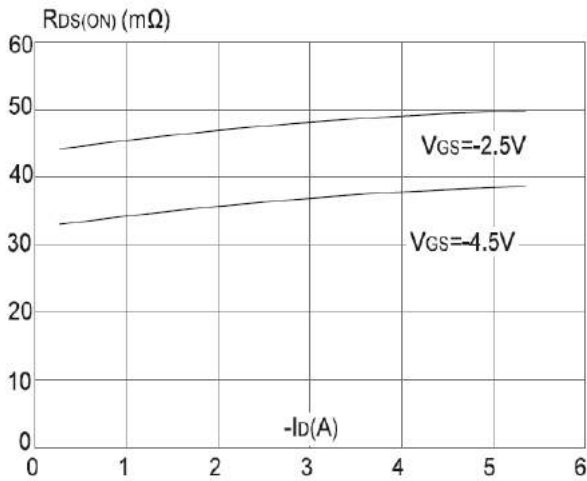


Fig.2 On-resistance vs. Drain Current

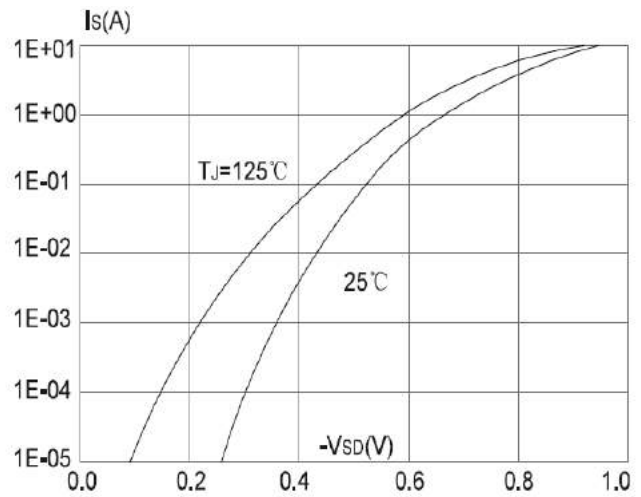


Fig. 5 Body Diode Characteristics

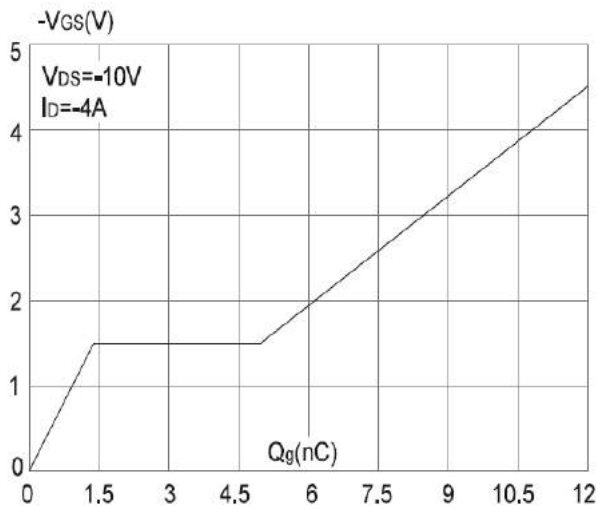


Fig.3 Gate Charge Characteristics

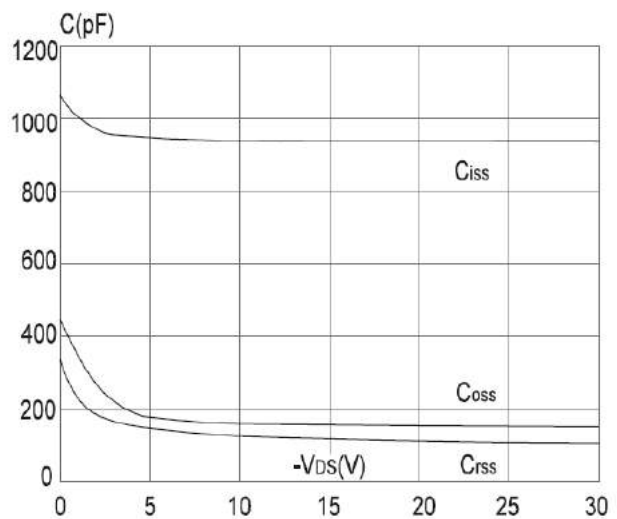


Fig. 6 Capacitance Characteristics

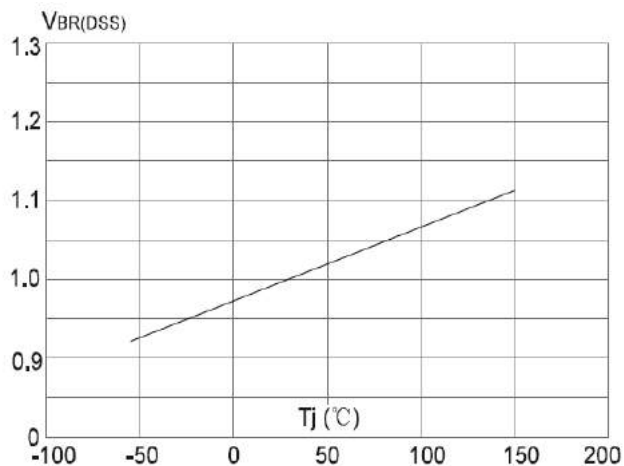


Fig.7 Normalized Breakdown Voltage vs. Junction Temperature

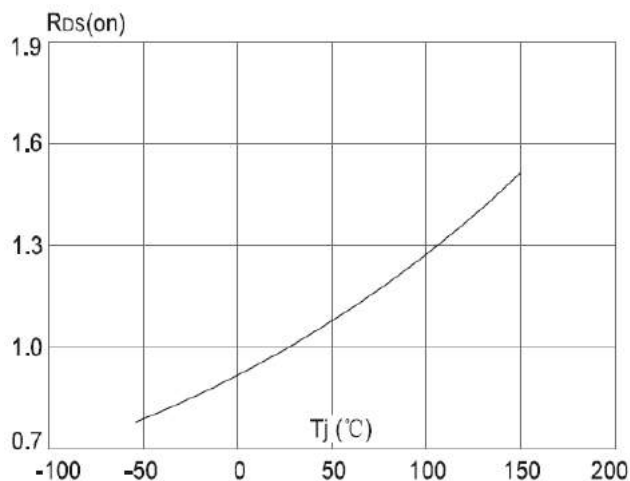


Fig.9 Normalized on Resistance vs. Junction Temperature

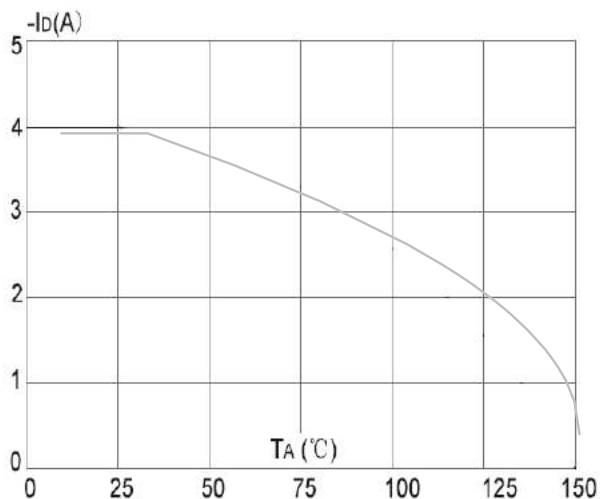


Fig.8 Maximum Continuous Drain Current vs. Case Temperature

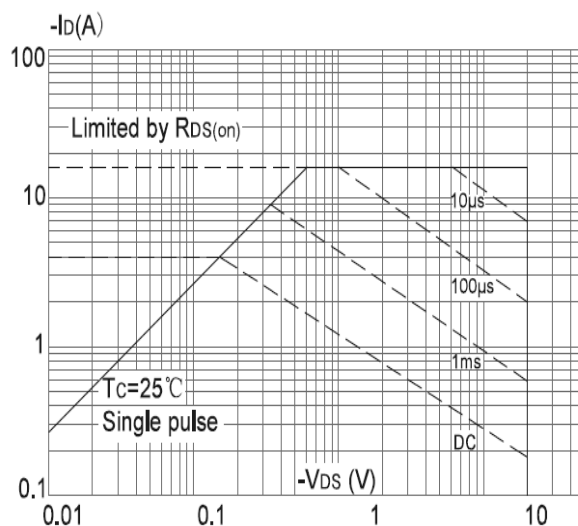


Fig.10 Safe Operating Area

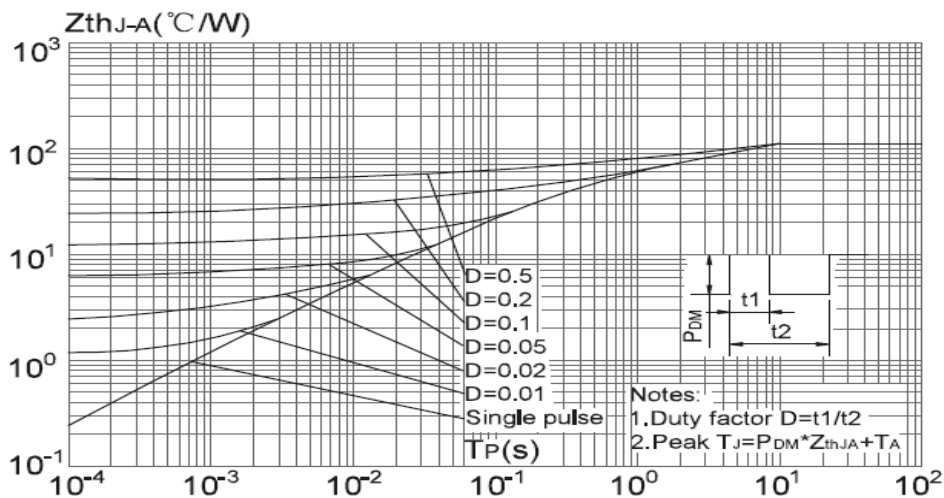
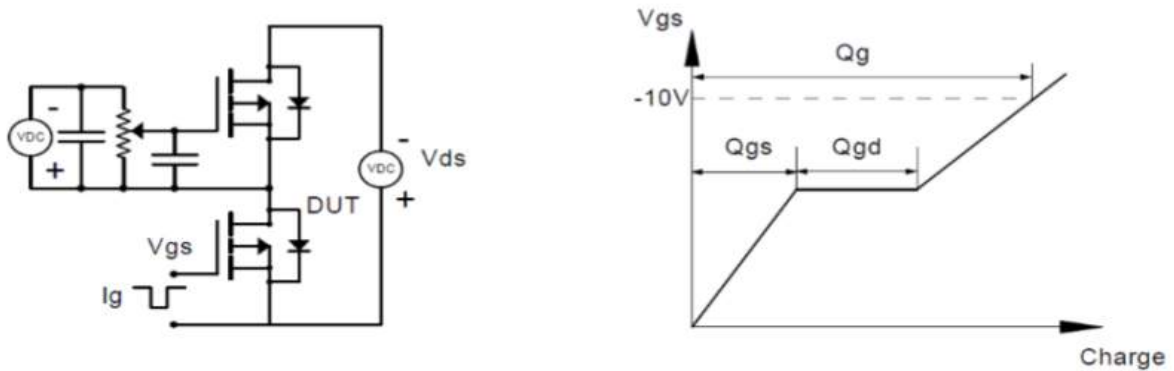


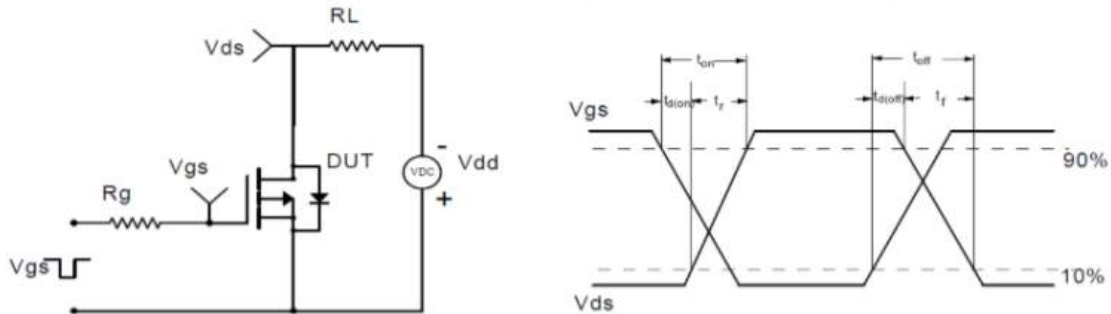
Fig.11 Transient Thermal Response Curve

Test Circuit

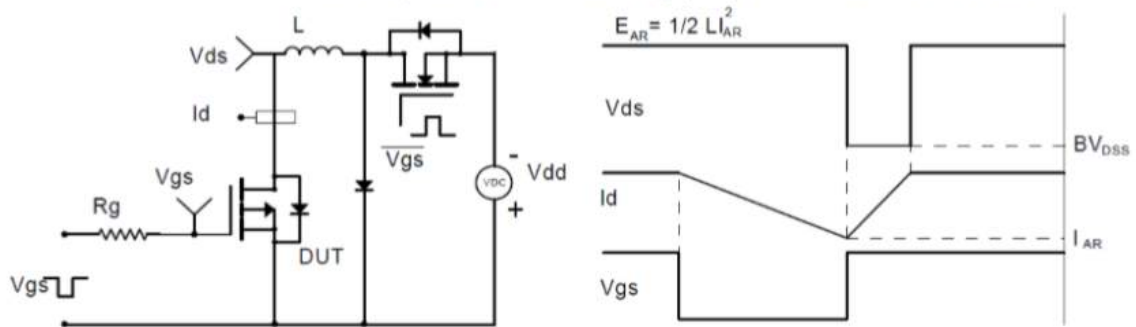
Gate Charge Test Circuit & Waveform



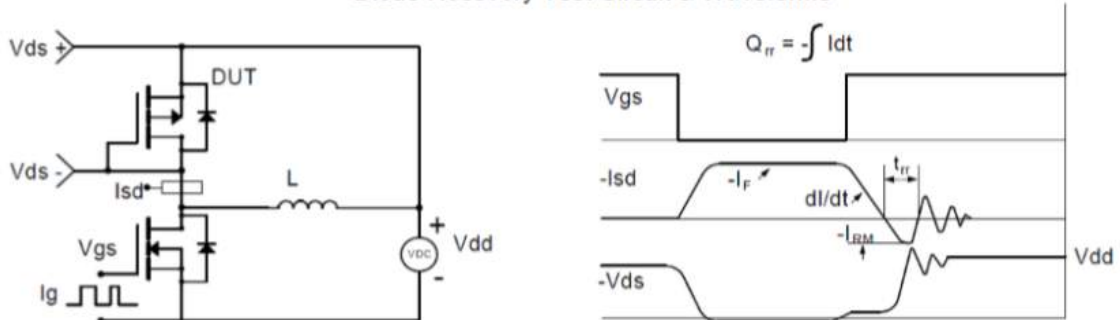
Resistive Switching Test Circuit & Waveforms



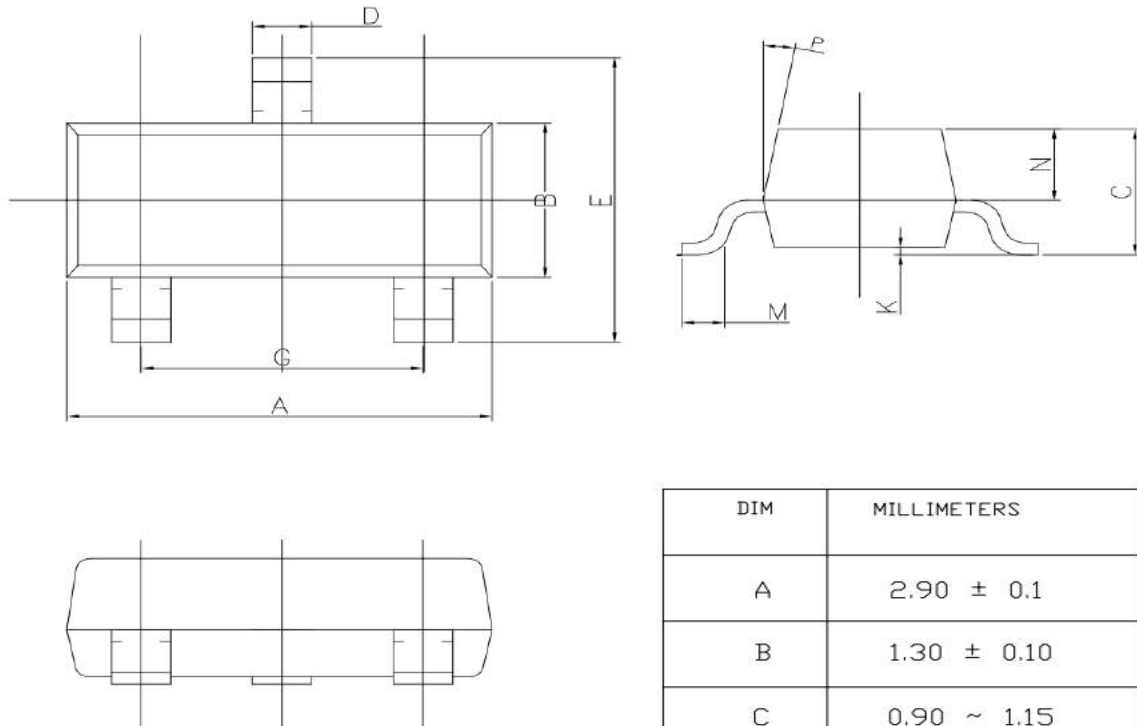
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



SOT-23 Package Information



DIM	MILLIMETERS
A	2.90 ± 0.1
B	1.30 ± 0.10
C	0.90 ~ 1.15
D	0.40 ± 0.1
E	2.40 ± 0.15
G	1.90 ± 0.10
K	0.00~0.10
M	0.30MIN
N	0.60 ± 0.10
P	10°TYP

Customer Service

Sales and Service:

zj@ztasemi.com