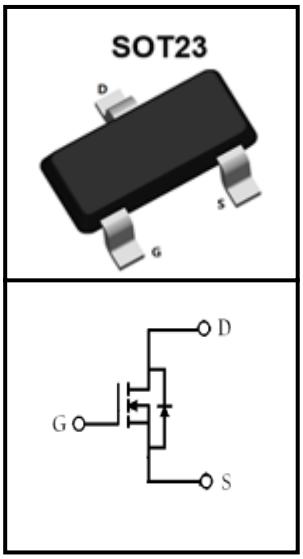
20V N-Channel Trench MOSFET

FEATURES

- Super Low Gate Charge
- RoHS compliant
- Green Device Available
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology

APPLICATIONS

- Load switch
- Battery protection
- Power management



Device Marking and Package Information		
Device	**Package**	**Marking**
CTZ2302A	SOT23	2302A

Absolute Maximum Ratings at T_j= 25ºC unless otherwise noted			
Parameter	**Symbol**	**Value**	**Unit**
Drain-Source Voltage (V_{GS} = 0V)	V_{DSS}	20	V
Continuous Drain Current T_A = 25ºC (note1)	I_D	2.5	A
Pulsed Drain Current (note2)	I_{DM}	10	A
Gate Source Voltage	V_{GSS}	±12	V
Power Dissipation (note3)	P_D	1	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~150	ºC

Thermal Characteristics			
Parameter	**Symbol**	**Value**	**Unit**
Thermal Resistance, Junction-Ambient (note1)	$R_{\theta JA}$	125	ºC/W

Electrical Characteristics T_j= 25ºC unless otherwise specified						
Parameter	**Symbol**	**Test Conditions**	**Value**			**Unit**
			Min.	**Typ.**	**Max.**	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	20	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 20V, V_{GS} = 0V, T_J = 25ºC	--	--	1	uA
Gate-Source Leakage	I_{GSS}	V_{GS} = ±12V	--	--	±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	0.5	0.65	1.0	V
Drain-Source On-Resistance (note2)	$R_{DS(on)}$	V_{GS} = 4.5V, I_D = 2.5A	--	46	60	mΩ
		V_{GS} = 2.5V, I_D = 1A	--	61	85	mΩ
Dynamic						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 10V, f = 1.0MHz	--	180	--	pF
Output Capacitance	C_{oss}		--	38	--	
Reverse Transfer Capacitance	C_{rss}		--	20	--	
Total Gate Charge (4.5V)	Q_g	V_{DD} = 10V, I_D = 2.5A, V_{GS} = 4.5V	--	3.5	--	nC
Gate-Source Charge	Q_{gs}		--	0.6	--	
Gate-Drain Charge	Q_{gd}		--	0.45	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DS} = 10V, I_D = 2.5A V_{GS} = 4.5V,R_G = 2.5Ω, RL=15Ω	--	8	--	nS
Turn-on Rise Time	t_r		--	7	--	
Turn-off Delay Time	$t_{d(off)}$		--	30	--	
Turn-off Fall Time	t_f		--	7	--	
Body Diode Characteristics						
Continuous Body Diode Current	I_S		--	--	2.5	A
Pulsed Diode Forward Current	I_{SM}		--	--	10	
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = 2.5A, V_{GS} = 0V	--	0.75	1.2	V

Notes

1. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.
2. The data tested by pulsed , pulse width≦300us , duty cycle≦2%
3. The power dissipation is limited by 150℃ junction temperature
4. The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristics T_J = 25ºC, unless otherwise noted

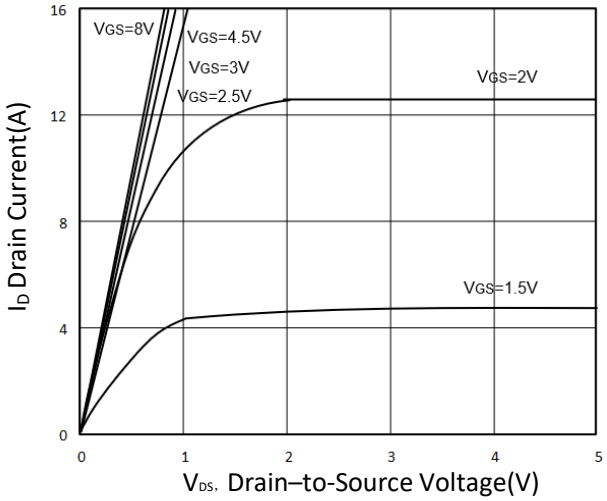


Fig.1 Typical Output Characteristics

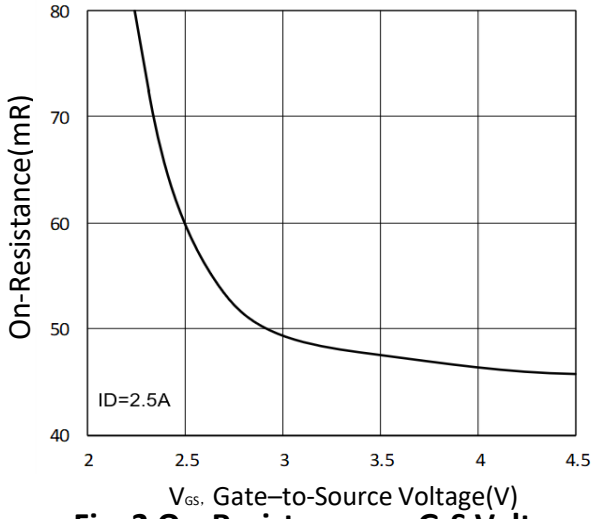


Fig. 2 On-Resistance vs. G-S Voltage

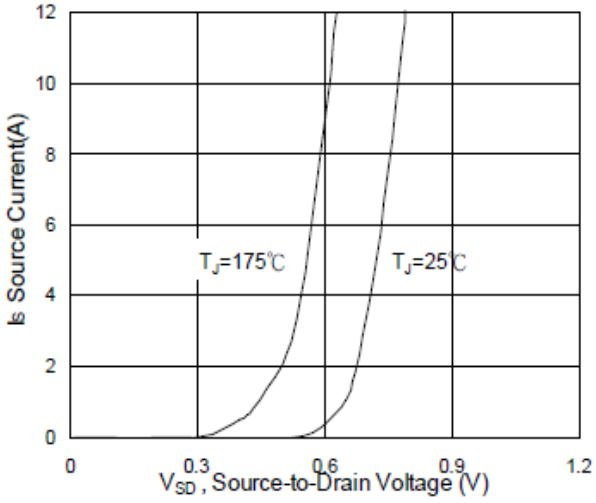


Fig.3 Forward Characteristics of Reverse Diode

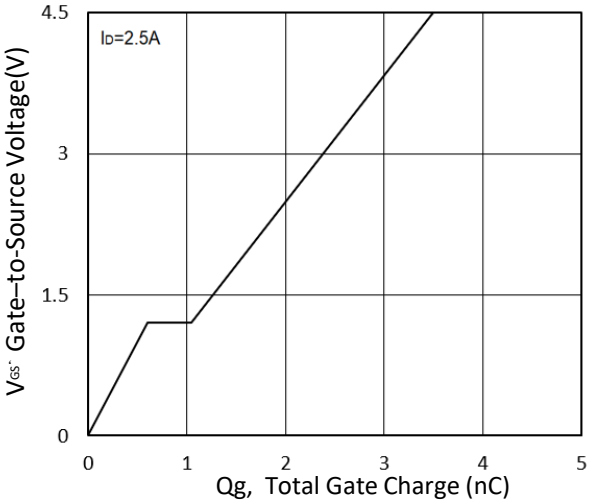


Fig.4 Gate-Charge Characteristics

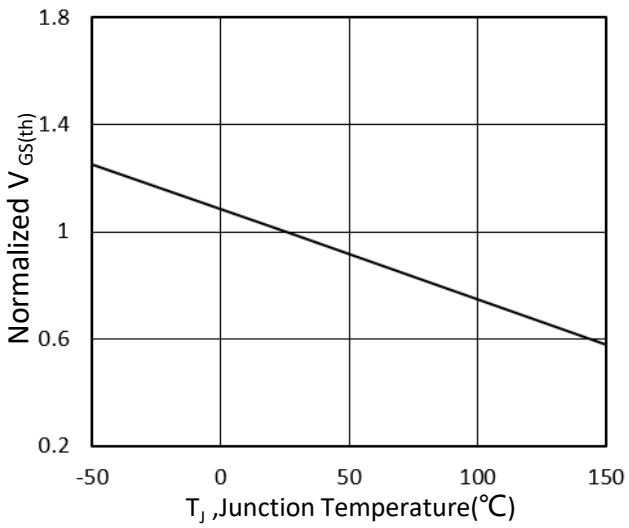


Fig.5 Normalized VGS(th) vs. T J

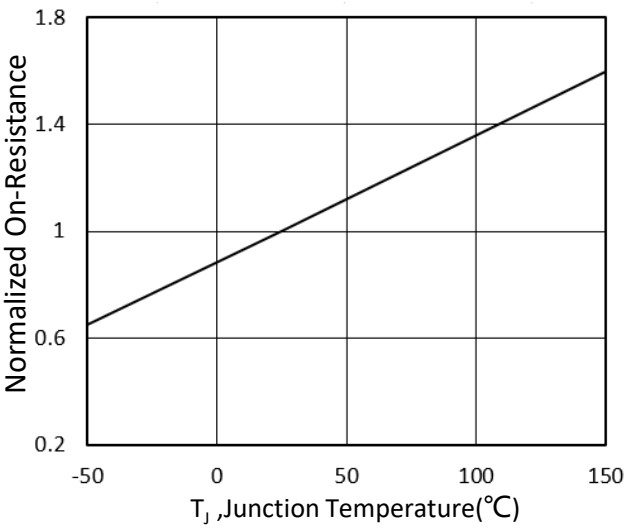


Fig.6 Normalized RDSON vs. T J

Typical Characteristics T_J = 25ºC, unless otherwise noted

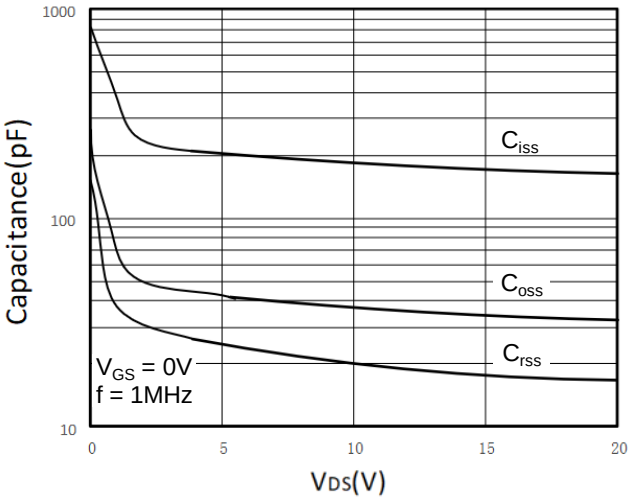


Fig.7 Capacitance

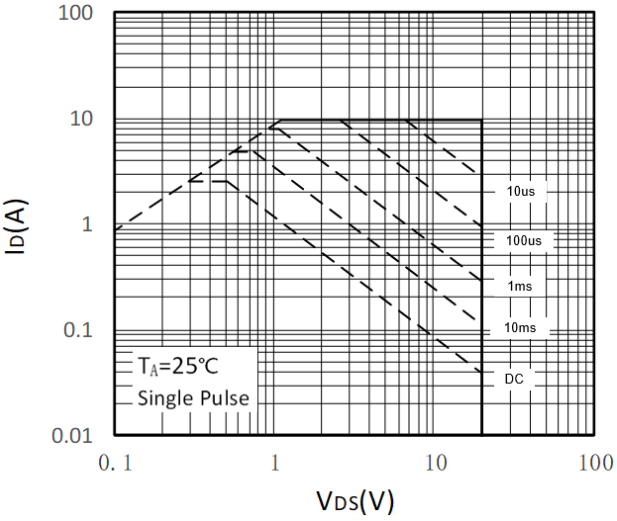


Fig.8 Safe Operating Area

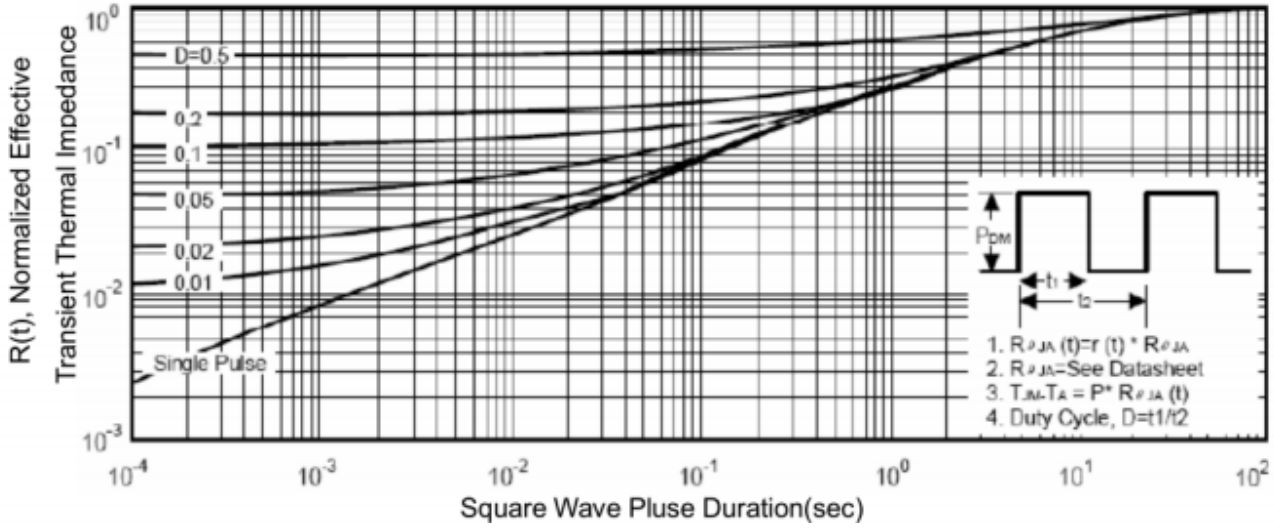


Fig.9 Normalized Maximum Transient Thermal Impedance

Figure A：Gate Charge Test Circuit and Waveform

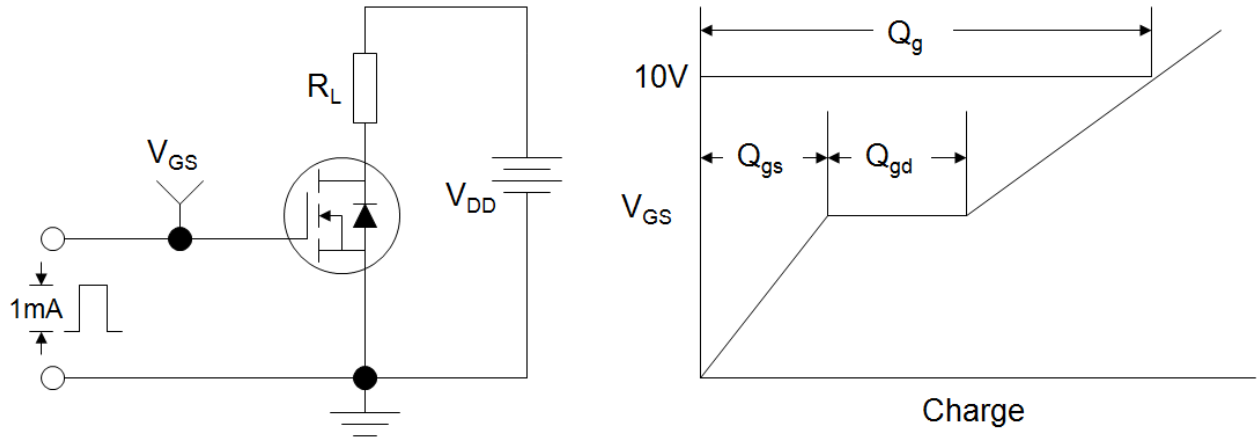


Figure B：Resistive Switching Test Circuit and Waveform

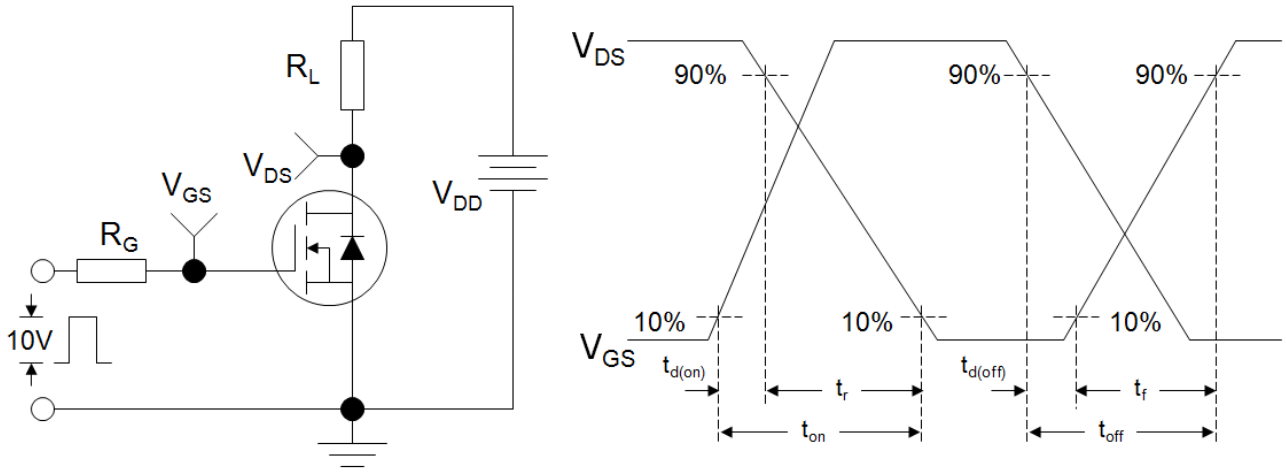
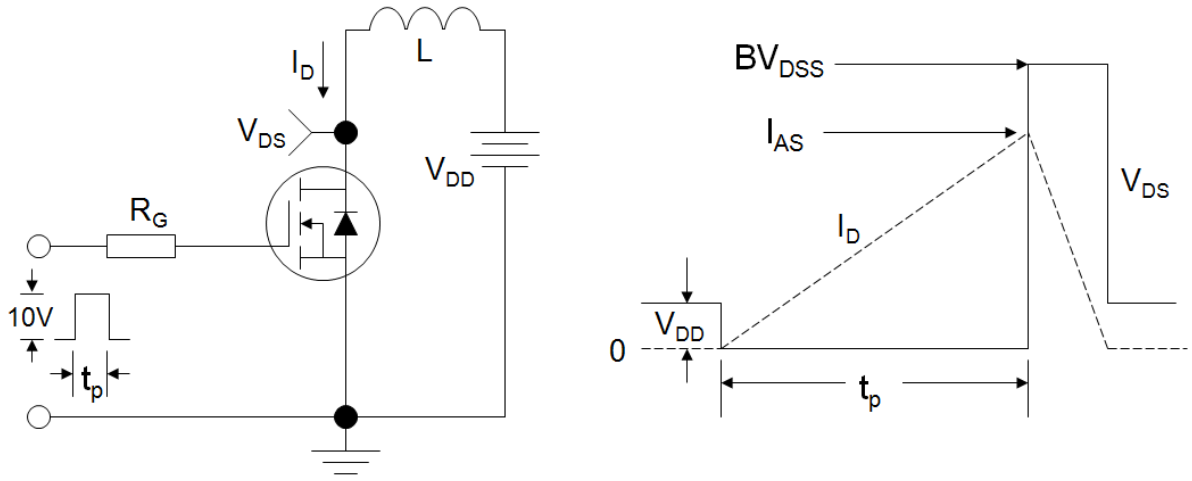
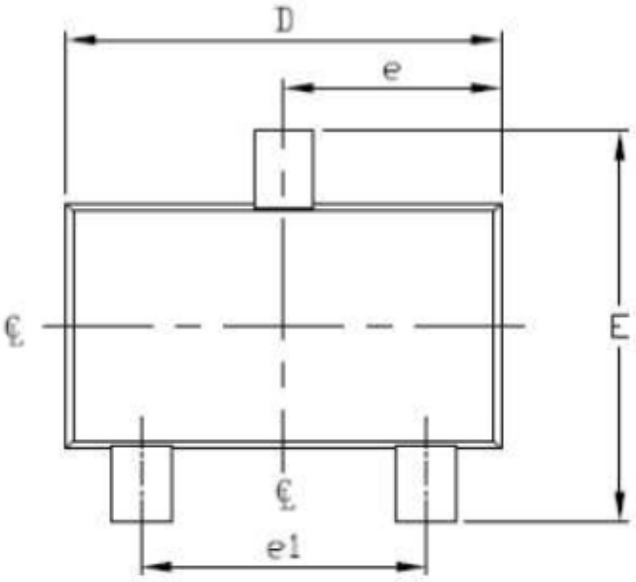
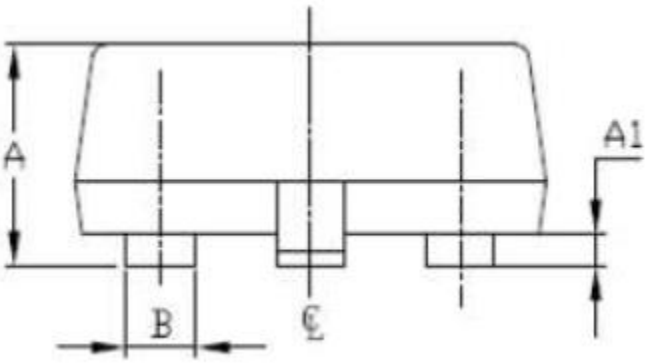


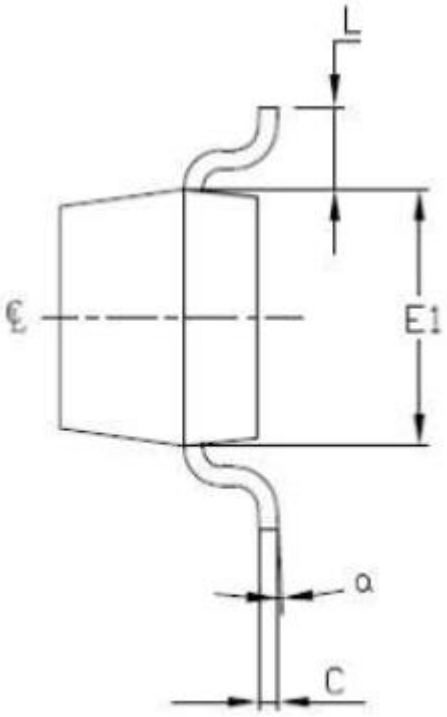
Figure C：Unclamped Inductive Switching Test Circuit and Waveform



SOT23







COMMON DIMENSIONS			
SYMBOL	mm		
	MIN	NOM	MAX
A	0.9	1.0	1.1
A1	0.00	0.06	0.1
B	0.3	0.4	0.5
C	0.07	0.09	0.18
D	2.8	2.9	3.04
E	2.1	2.33	2.64
E1	1.2	1.3	1.4
e	1.4	1.45	1.5
e1	1.80	1.90	2.00
L	0.45	0.54	0.63
a	0°	2.5°	7°

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