

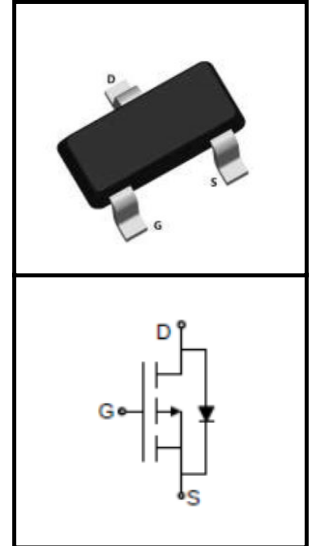
20V P-Channel Trench MOSFET

FEATURES

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

APPLICATIONS

- Load Switch
- Power Management
- Pulse Width Modulation(PWM)



Device Marking and Package Information

Device	Package	Marking
CTZ2305A	SOT-23	2305A

Absolute Maximum Ratings at $T_j = 25^{\circ}\text{C}$ unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage ($V_{GS} = 0\text{V}$)	V_{DSS}	-20	V
Continuous Drain Current $T_A = 25^{\circ}\text{C}$ (note1)	I_D	-4.2	A
Pulsed Drain Current (note2)	I_{DM}	-14	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	$^{\circ}\text{C}$

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-Ambient (note1)	$R_{\theta JA}$	125	$^{\circ}\text{C/W}$

Electrical Characteristics $T_J = 25^\circ\text{C}$ 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 = 25°C	--	--	-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	-0.6	-1.0	V
Drain-Source On-Resistance (note2)	R _{DS(on)}	V _{GS} = -4.5V, I _D = -4.2A	--	38	50	mΩ
		V _{GS} = -2.5V, I _D = -3A	--	46	60	mΩ
Dynamic						
Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = -10V, f = 1.0MHz	--	740	--	pF
Output Capacitance	C _{oss}		--	290	--	
Reverse Transfer Capacitance	C _{rss}		--	190	--	
Total Gate Charge	Q _g	V _{DD} = -10V, I _D = -3.2A, V _{GS} = -4.5V	--	6.1	--	nC
Gate-Source Charge	Q _{gs}		--	1.7	--	
Gate-Drain Charge	Q _{gd}		--	1.2	--	
Turn-on Delay Time	t _{d(on)}	V _{DS} = -10V, I _D = -1A V _{GS} = -4.5V,R _G = 6Ω,RL=2.8Ω	--	12.5	--	ns
Turn-on Rise Time	t _r		--	35	--	
Turn-off Delay Time	t _{d(off)}		--	30	--	
Turn-off Fall Time	t _f		--	10	--	
Body Diode Characteristics						
Continuous Body Diode Current	I _S		--	--	-4.2	A
Pulsed Diode Forward Current	I _{SM}		--	--	-14	
Body Diode Voltage	V _{SD}	T _J = 25°C, I _{SD} = -3.1A, V _{GS} = 0V	--	-0.81	-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 $\leq 300\mu s$, duty cycle $\leq 2\%$
3. The power dissipation is limited by 150 $^\circ\text{C}$ 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 $T_J = 25^\circ\text{C}$, unless otherwise noted

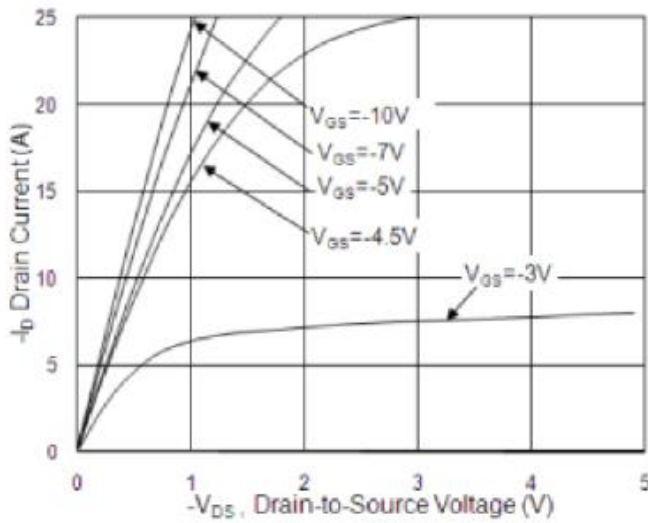


Fig.1 Typical Output Characteristics

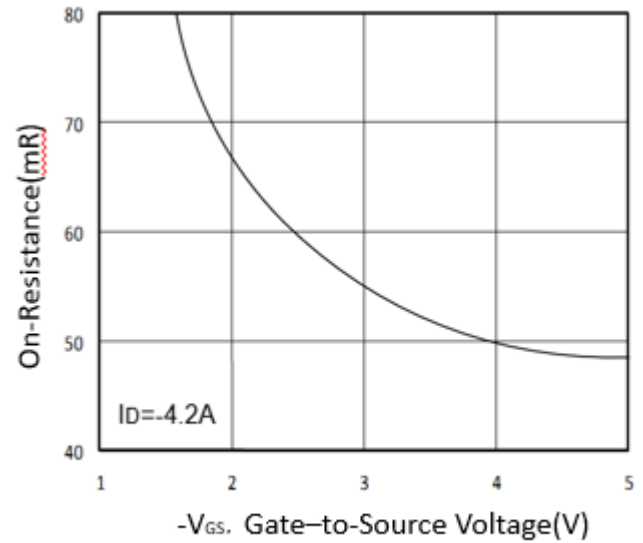


Fig.2 On-Resistance vs. G-S Voltage

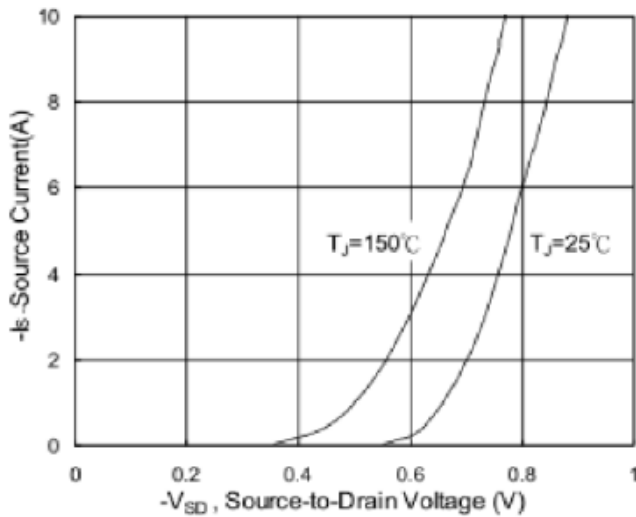


Fig.3 Forward Characteristics of Reverse Diode

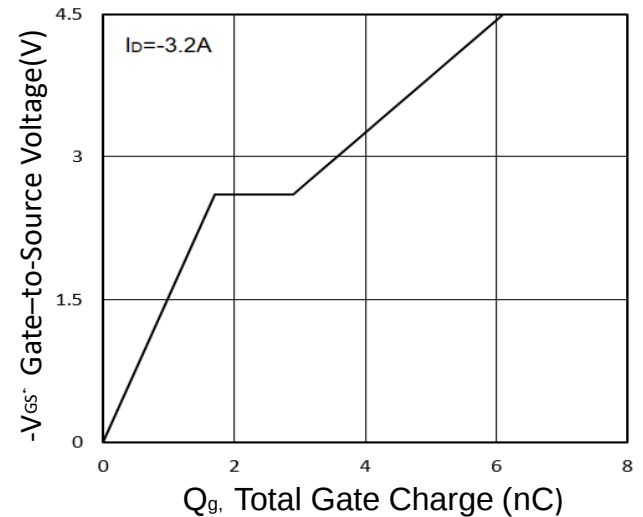


Fig.4 Gate-Charge Characteristics

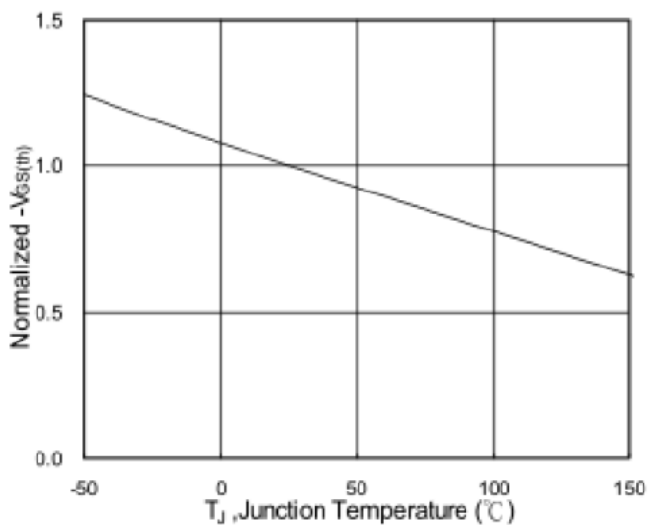


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

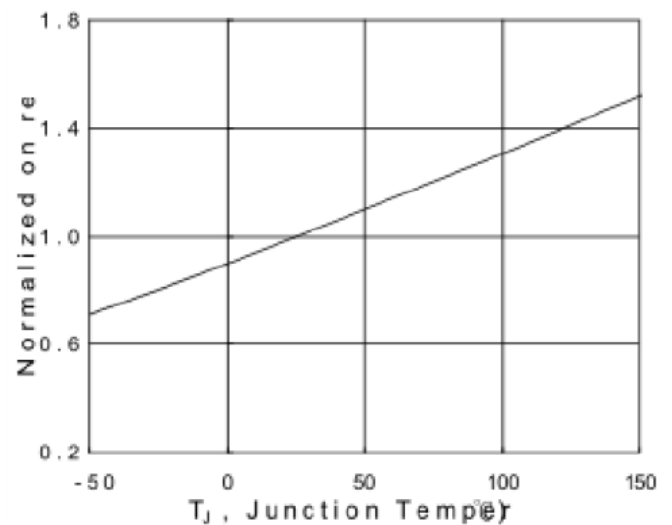


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

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

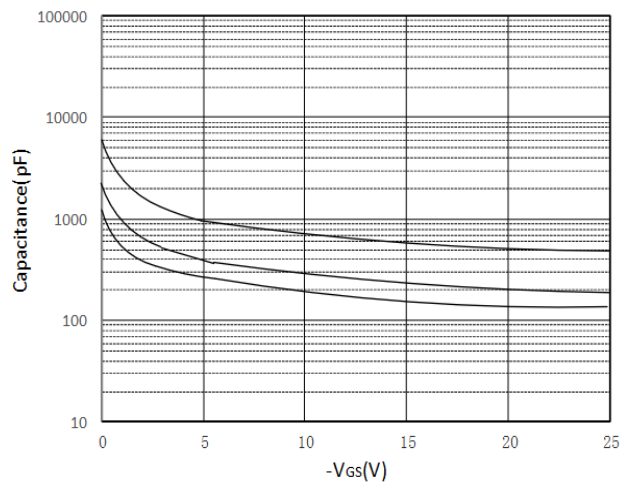


Fig.7 Capacitance

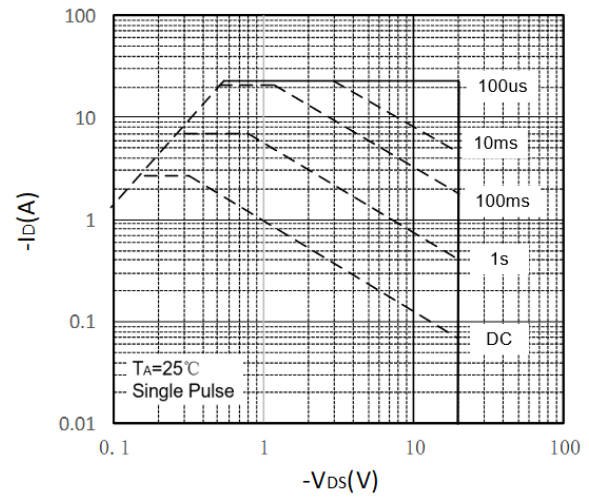


Fig.8 Safe Operating Area

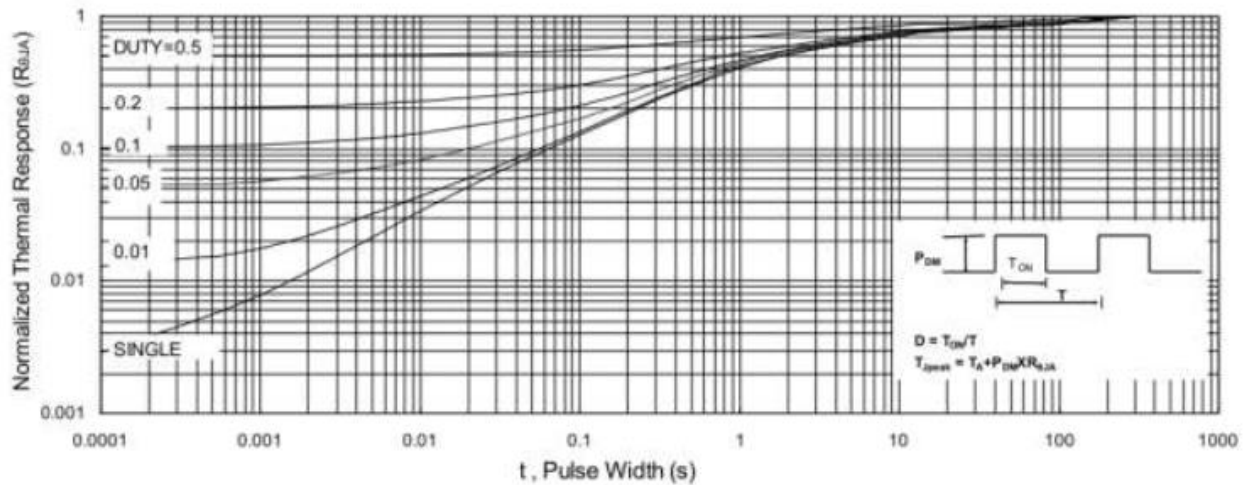
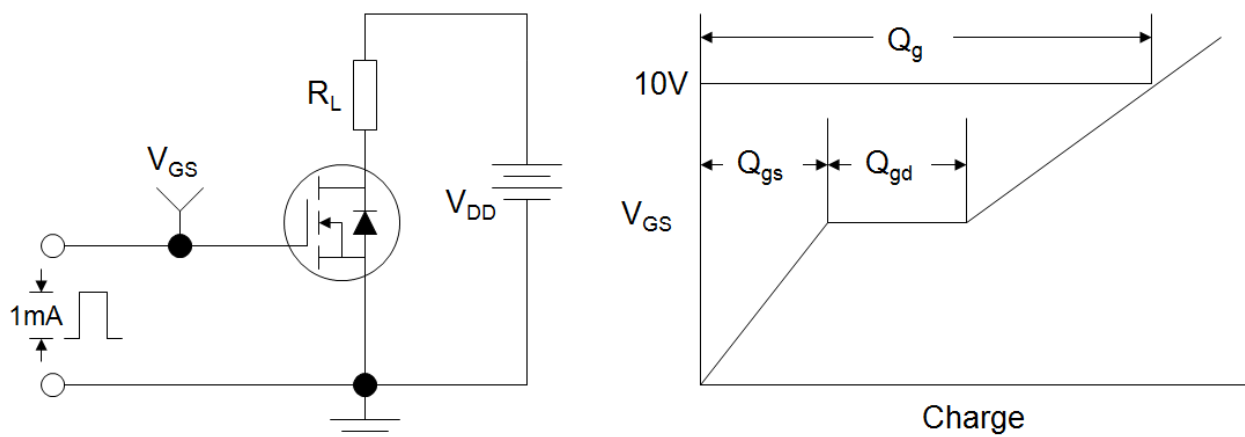
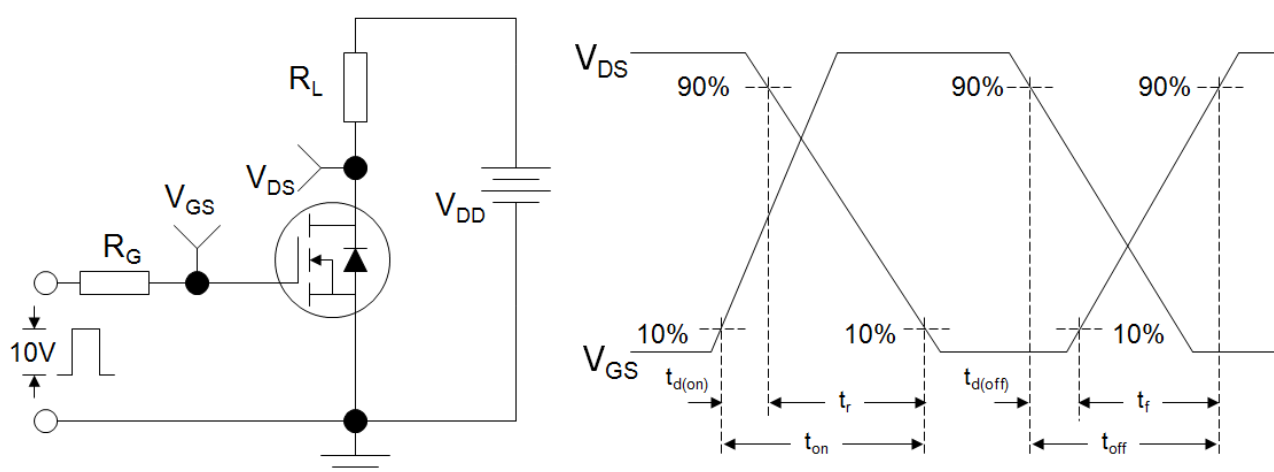
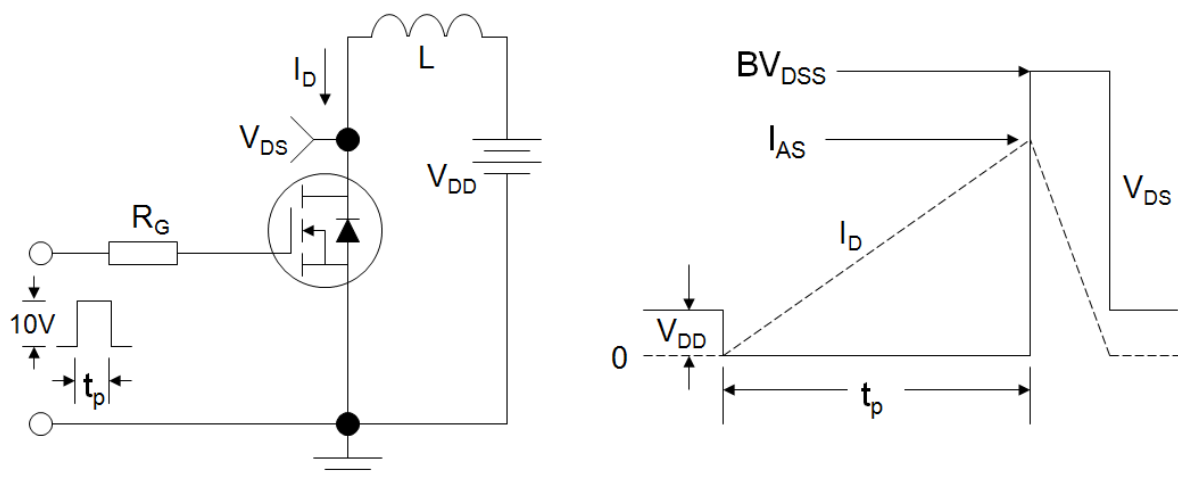
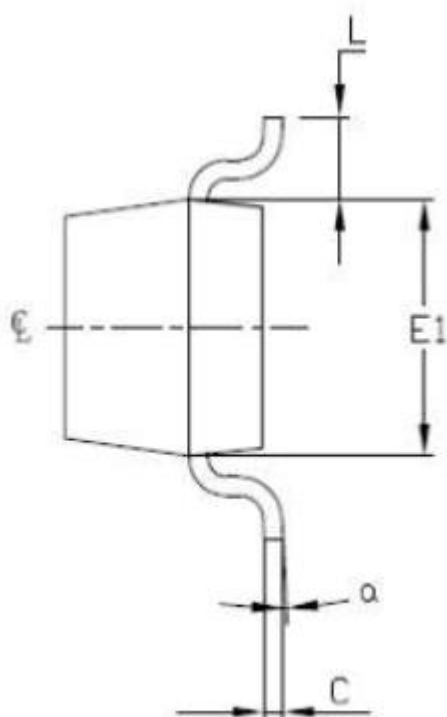
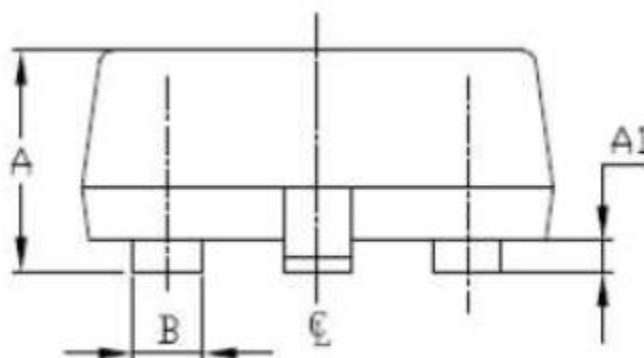
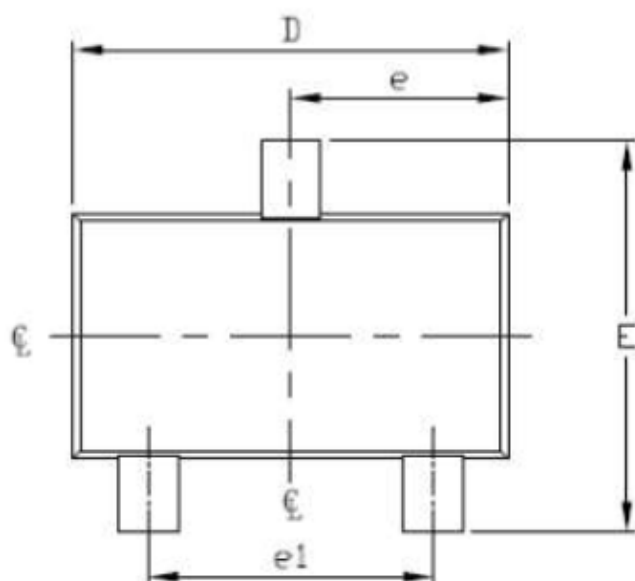


Fig.9 Normalized Maximum Transient Thermal Impedance

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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