

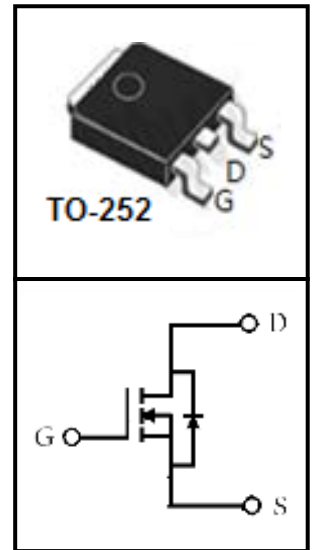
30V N-Channel Trench MOSFET

FEATURES

- Super Low Gate Charge
- 100% EAS Guaranteed
- RoHS compliant
- Green Device Available
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology

APPLICATIONS

- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Hard switched and high frequency circuits



Device Marking and Package Information

Device	Package	Marking
CTD03N10P5	TO-252	CTD03N10P5

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}	30	V
Continuous Drain Current $T_C = 25^{\circ}\text{C}$ (note1)	I_D	50	A
Continuous Drain Current $T_C = 100^{\circ}\text{C}$ (note1)		37	A
Pulsed Drain Current (note2)	I_{DM}	200	A
Gate Source Voltage	V_{GSS}	± 20	V
Single Pulse Avalanche Energy (note3)	E_{AS}	72.6	mJ
Power Dissipation $T_C = 25^{\circ}\text{C}$ (note4)	P_D	46.8	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~175	$^{\circ}\text{C}$

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-Case (note1)	$R_{\theta JC}$	3.2	$^{\circ}\text{C/W}$
Thermal Resistance, Junction-Ambient (note1)	$R_{\theta JA}$	50	$^{\circ}\text{C/W}$

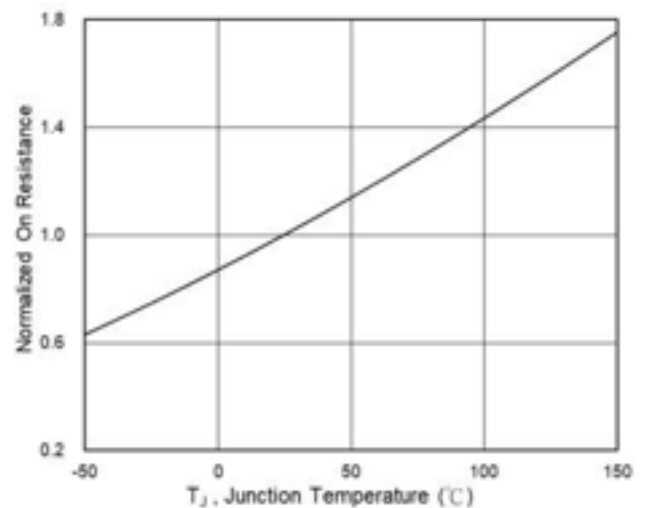
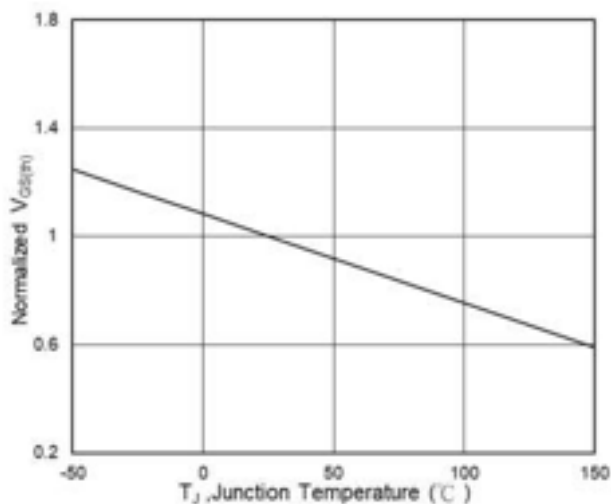
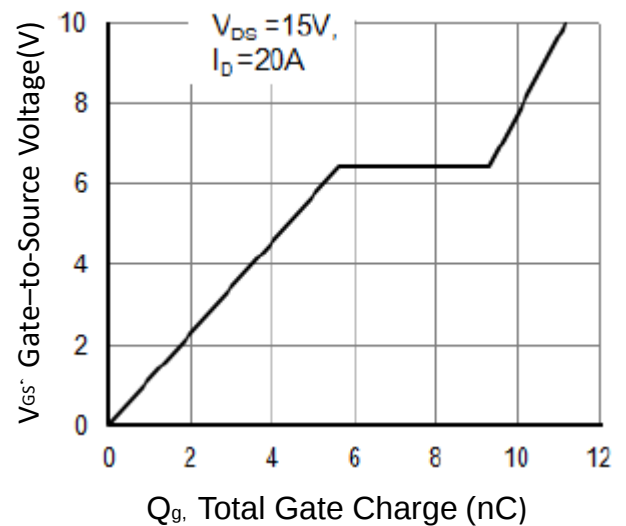
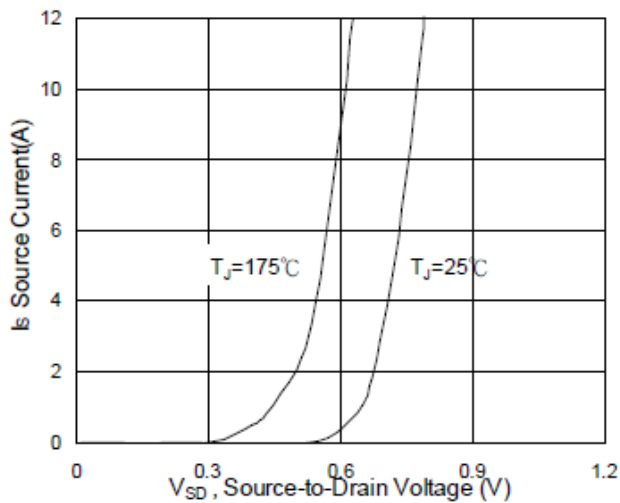
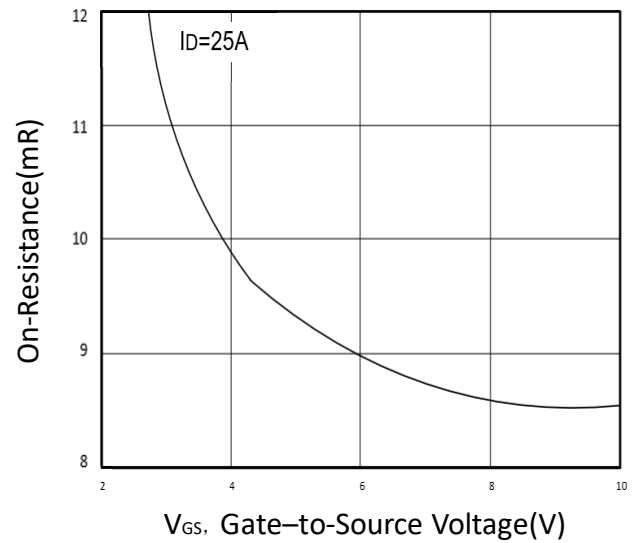
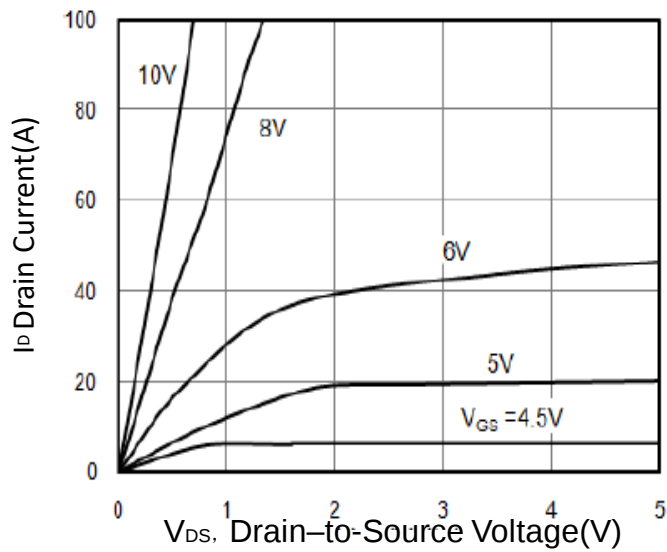
Electrical Characteristics $T_J = 25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	30	--	--	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30V, V _{GS} = 0V, T _J = 25°C	--	--	1	uA
		V _{DS} = 30V, V _{GS} = 0V, T _J = 125°C	--	--	100	uA
Gate-Source Leakage	I _{GSS}	V _{GS} = ±20V	--	--	±100	nA
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	3	4	5	V
Drain-Source On-Resistance (note2)	R _{DS(on)}	V _{GS} = 10V, I _D = 25A	--	8.5	10	mΩ
Dynamic						
Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = 15V, f = 1.0MHz	--	722	--	pF
Output Capacitance	C _{oss}		--	223	--	
Reverse Transfer Capacitance	C _{rss}		--	80	--	
Gate Resistance	Rg	f = 1.0MHz	--	7.5	--	Ω
Total Gate Charge	Q _g	V _{DS} = 15V, I _D = 20A, V _{GS} = 10V	--	11.2	--	nC
Gate-Source Charge	Q _{gs}		--	5.6	--	
Gate-Drain Charge	Q _{gd}		--	3.7	--	
Turn-on Delay Time	t _{d(on)}	V _{DS} = 15V, V _{GS} = 10V,R _G = 1.6Ω I _D = 20A	--	36.1	--	ns
Turn-on Rise Time	t _r		--	4.1	--	
Turn-off Delay Time	t _{d(off)}		--	37.1	--	
Turn-off Fall Time	t _f		--	4.5	--	
Body Diode Characteristics						
Continuous Body Diode Current	I _S	T _C = 25 °C	--	--	50	A
Pulsed Diode Forward Current	I _{SM}		--	--	200	
Body Diode Voltage	V _{SD}	T _J = 25°C, I _{SD} = 25A, V _{GS} = 0V	--	--	1	V
Reverse Recovery Time	t _{rr}	TJ=25°C I _F =20A, di/dt=100A/μs	--	27	--	nS
Reverse Recovery Charge	Q _{rr}		--	7.2	--	nc

Notes

1. The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
2. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. The EAS data shows Max. rating . The test condition is $V_{DD} = 25V, V_{GS} = 10V, L = 0.1mH$
4. The power dissipation is limited by 175 $^\circ\text{C}$ junction temperature
5. 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



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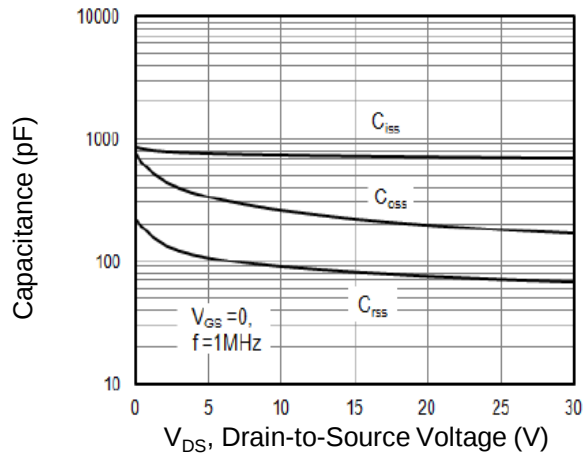


Fig.7 Capacitance

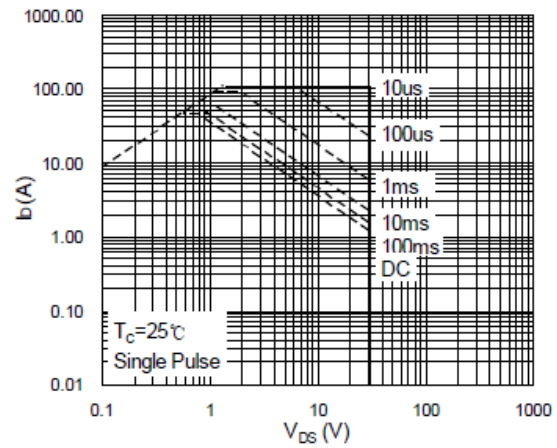


Fig.8 Safe Operating Area

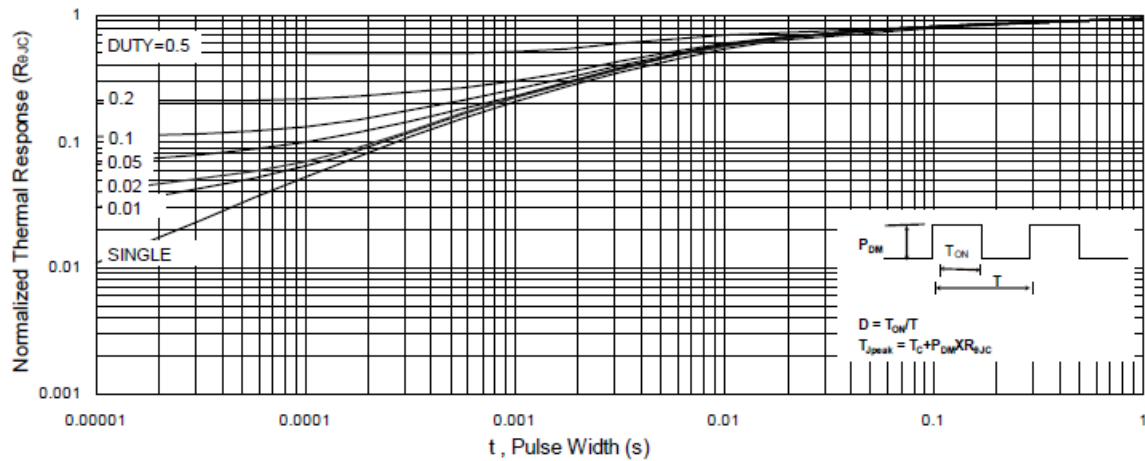
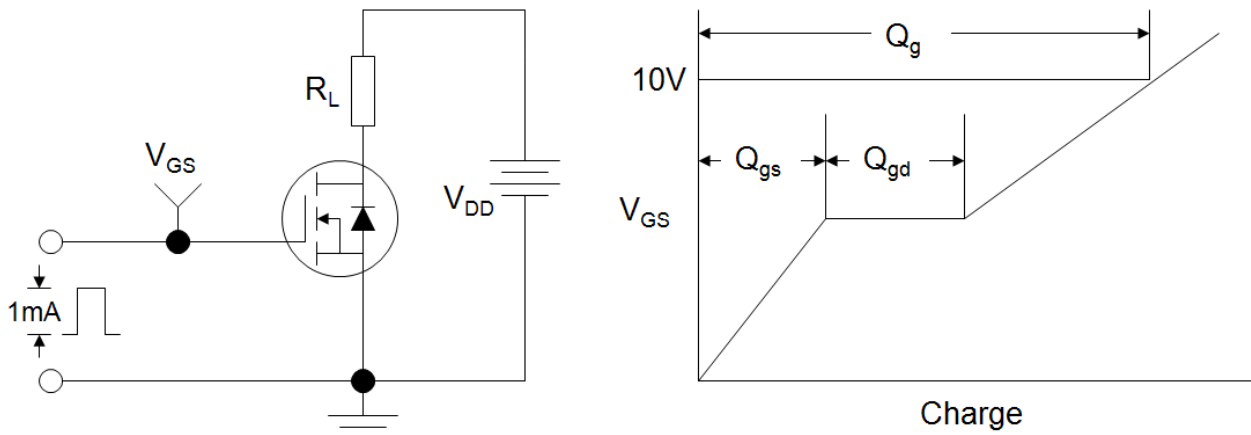
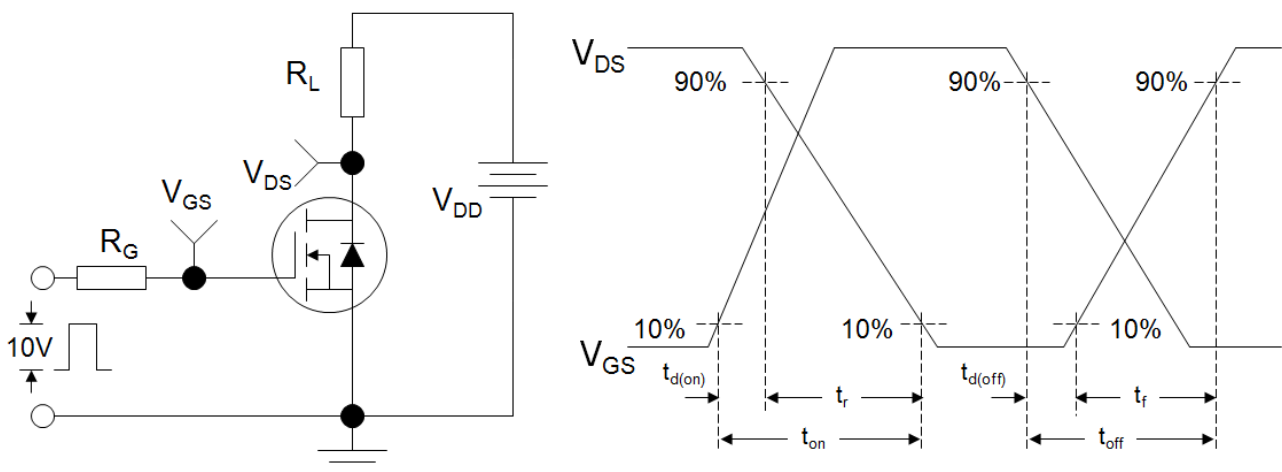
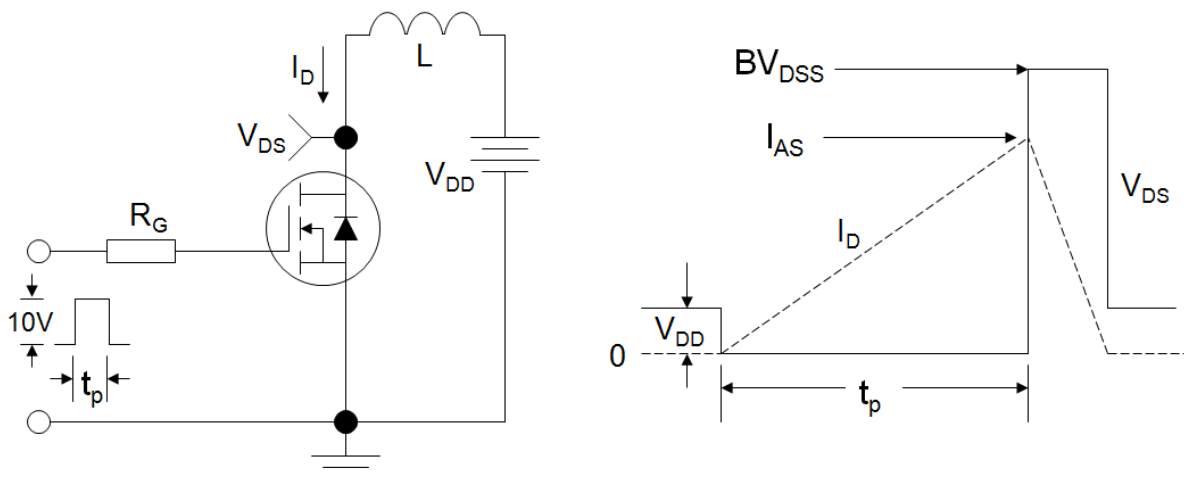
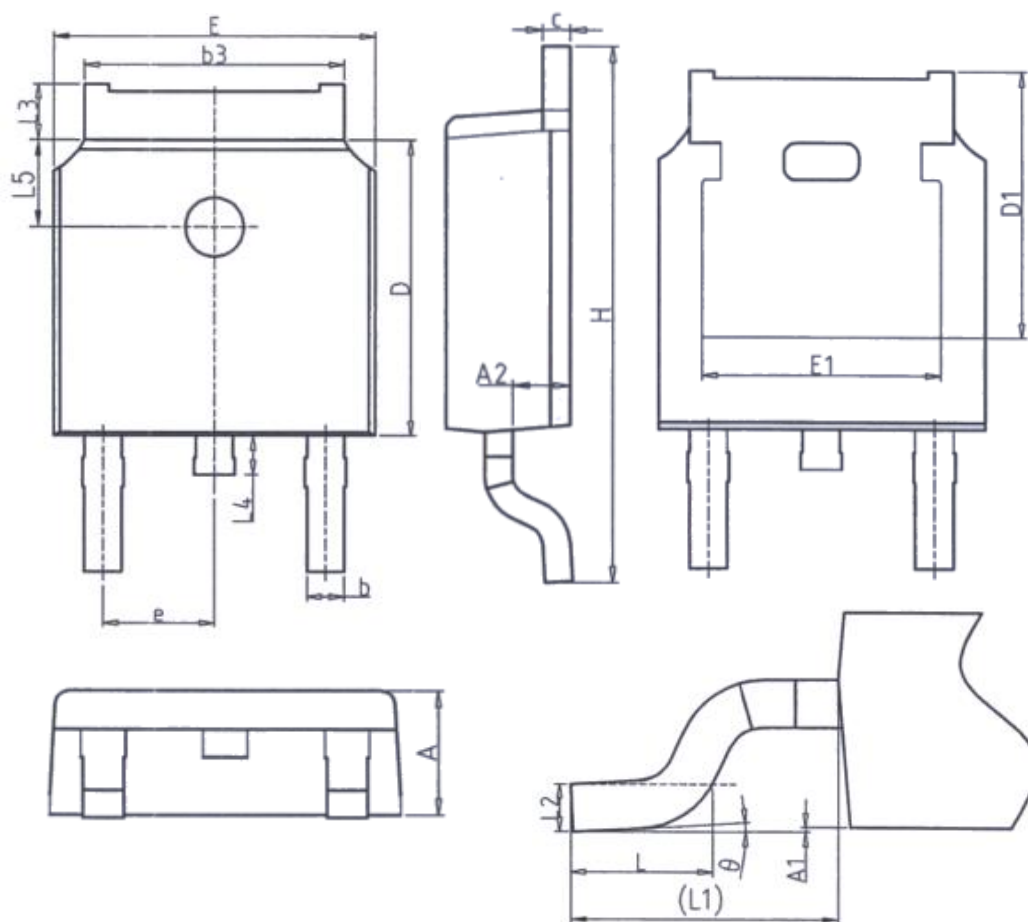


Fig.9 Normalized Maximum Transient Thermal Impedance

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


TO-252



Unit: mm		
Symbol	Min.	Max.
A	2.20	2.40
A1	0.00	0.20
A2	0.97	1.17
b	0.68	0.90
b3	5.20	5.50
c	0.43	0.63
D	5.98	6.22
D1	5.30REF	
E	6.40	6.80
E1	4.63	-

Unit: mm		
Symbol	Min.	Max.
e	2.286BSC	
H	9.40	10.50
L	1.38	1.75
L1	2.90REF	
L2	0.51BSC	
L3	0.88	1.28
L4	-	1.00
L5	1.65	1.95
θ	0°	8°

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