

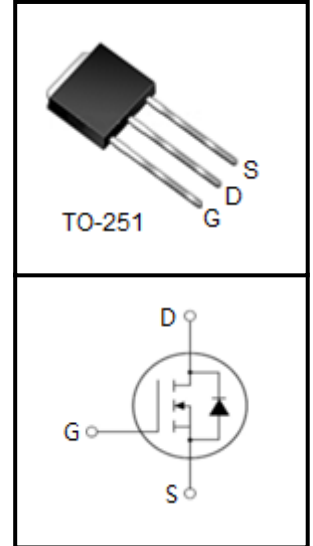
30V N-Channel Trench MOSFET

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
CTU03N8P5	TO-251	CTU03N8P5

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	60	A
Continuous Drain Current $T_C = 100^{\circ}\text{C}$ (note1)		40	A
Pulsed Drain Current (note2)	I_{DM}	120	A
Gate Source Voltage	V_{GSS}	± 20	V
Single Pulse Avalanche Energy (note3)	E_{AS}	57.8	mJ
Power Dissipation (note4)	P_D	41	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)	$R_{\theta JC}$	3.6	$^{\circ}\text{C/W}$
Thermal Resistance, Junction-Ambient (note1)	$R_{\theta JA}$	62	

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} = 24V, V _{GS} = 0V, T _J = 25°C	--	--	1	uA
		V _{DS} = 24V, V _{GS} = 0V, T _J = 55°C	--	--	5	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	1.2	--	2.5	V
Drain-Source On-Resistance (note3)	R _{DS(on)}	V _{GS} = 10V, I _D = 30A	--	7.3	8.5	mΩ
		V _{GS} = 4.5V, I _D = 15A	--	11	14	mΩ
Dynamic						
Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = 15V, f = 1.0MHz	--	1317	1843	pF
Output Capacitance	C _{oss}		--	163	228	
Reverse Transfer Capacitance	C _{rss}		--	131	183	
Total Gate Charge	Q _g	V _{DD} = 15V, I _D = 15A, V _{GS} = 4.5V	--	12.6	17.6	nC
Gate-Source Charge	Q _{gs}		--	4.2	5.9	
Gate-Drain Charge	Q _{gd}		--	5.1	7.1	
Turn-on Delay Time	t _{d(on)}	V _{DS} = 15V, I _D = 15A V _{GS} = 10V,R _G = 3.3Ω	--	4.6	9.2	ns
Turn-on Rise Time	t _r		--	12.2	22	
Turn-off Delay Time	t _{d(off)}		--	26.6	53	
Turn-off Fall Time	t _f		--	8	16	
Body Diode Characteristics						
Continuous Body Diode Current	I _S	T _C = 25°C	--	--	60	A
Pulsed Diode Forward Current	I _{SM}		--	--	120	
Body Diode Voltage	V _{SD}	T _J = 25°C, I _{SD} = 30A, V _{GS} = 0V	--	--	1.2	V
Reverse Recovery Time	t _{rr}	I _F = 30A di _F /dt = 100A/μs	--	9.2	--	ns
Reverse Recovery Charge	Q _{rr}		--	2.0	--	nC

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 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°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

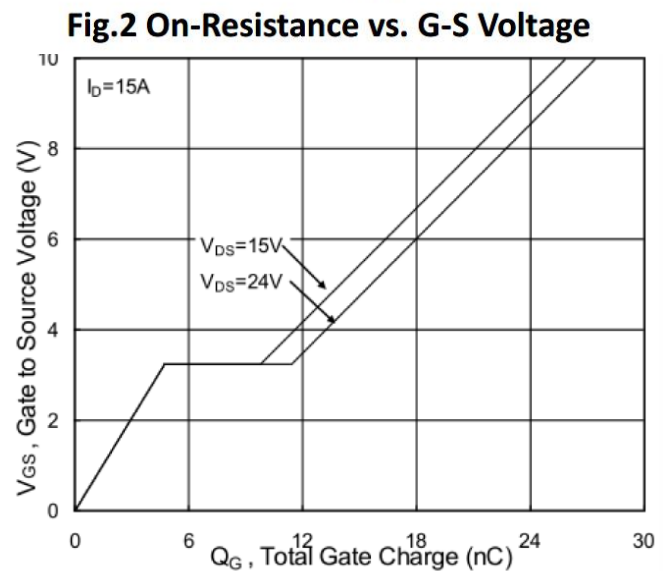
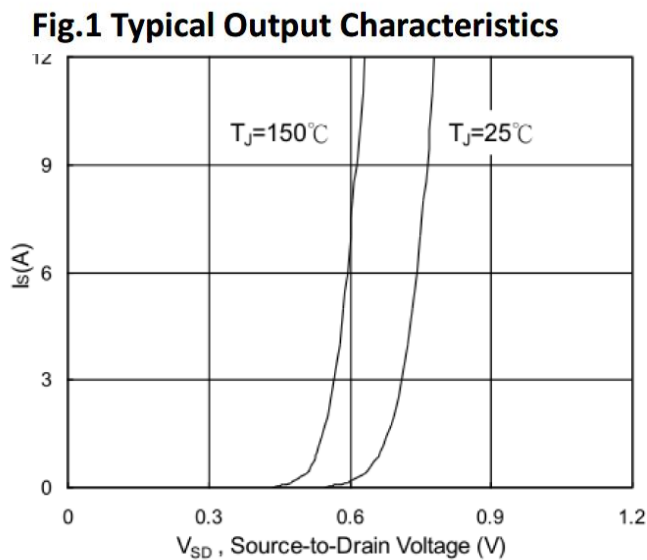
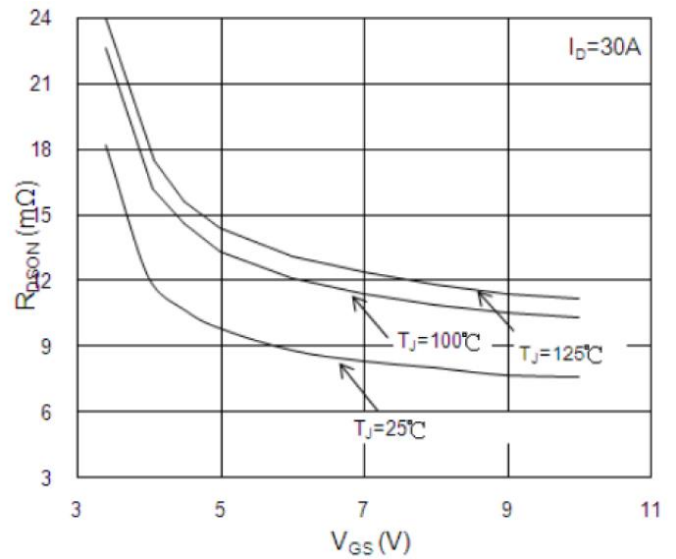
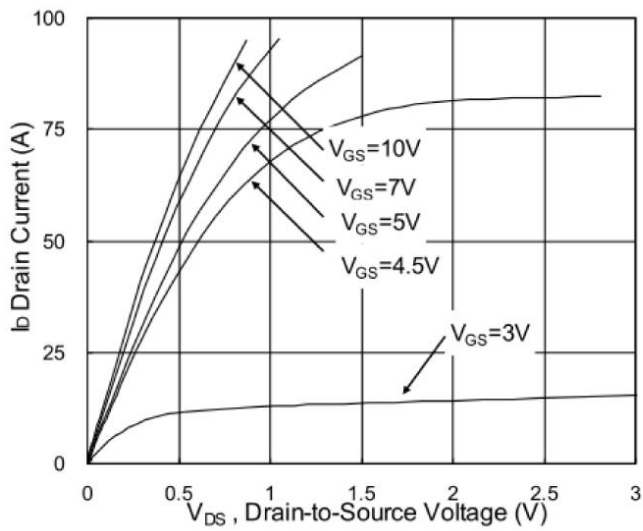
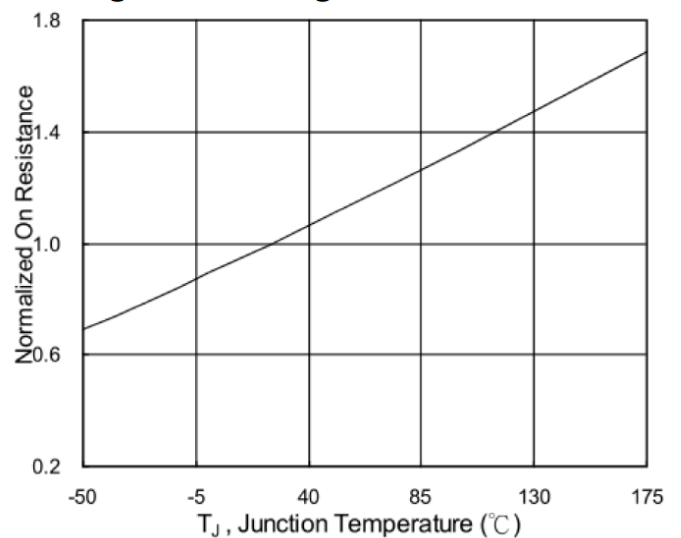
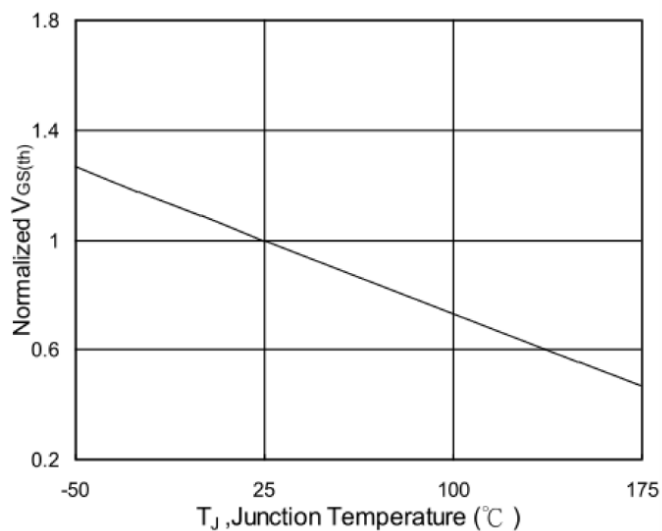


Fig.3 Forward Characteristics of Reverse Diode

Fig.4 Gate-Charge Characteristics



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

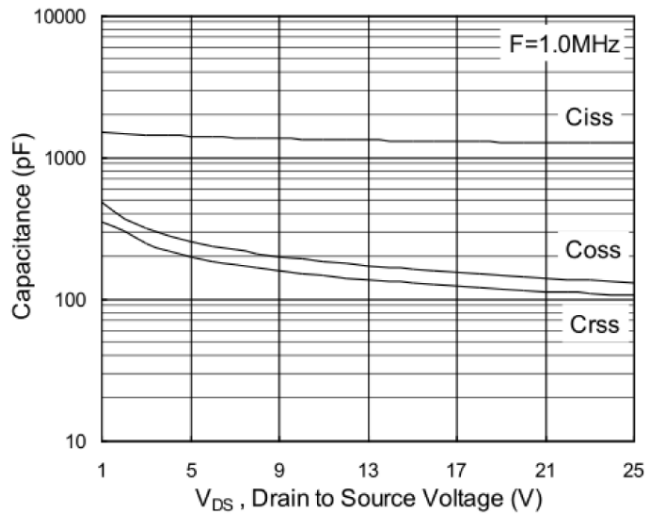
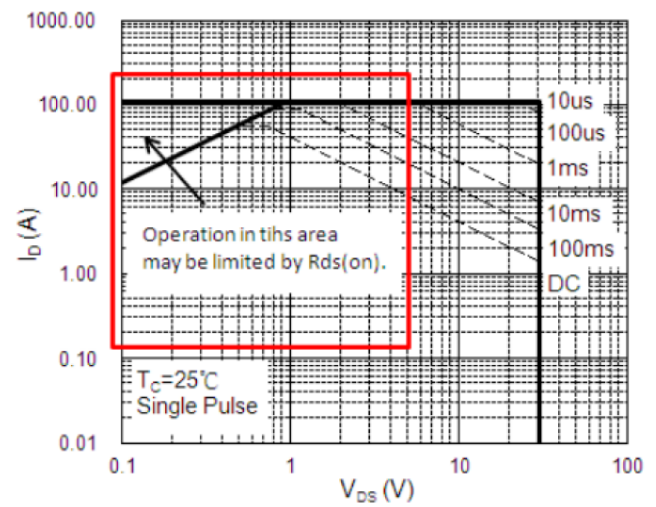
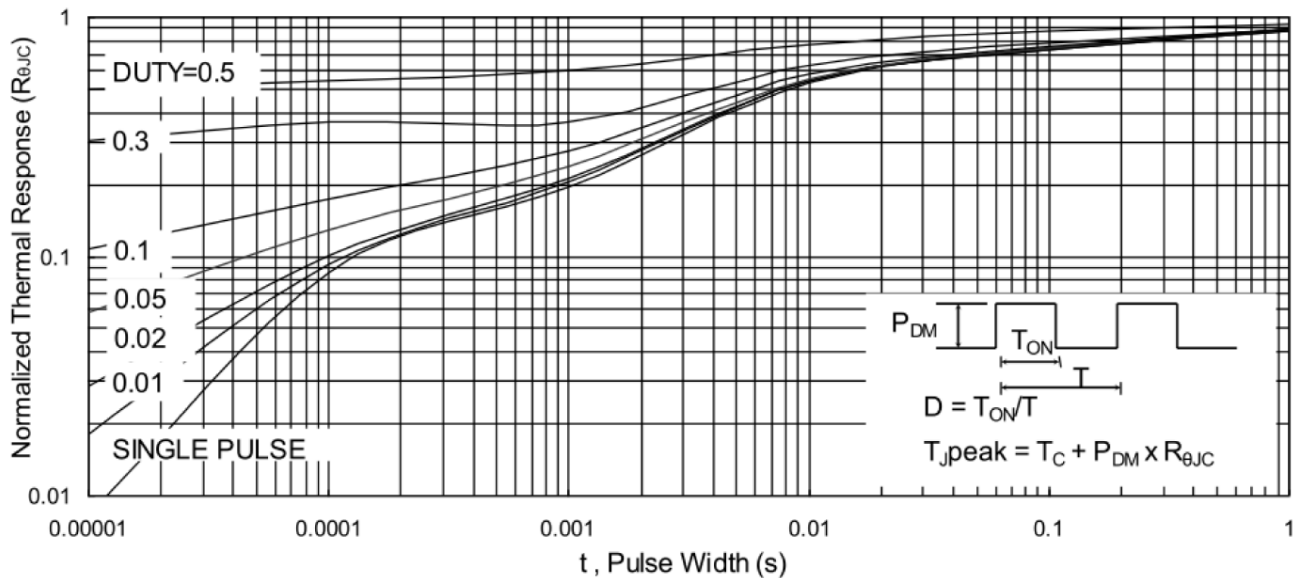
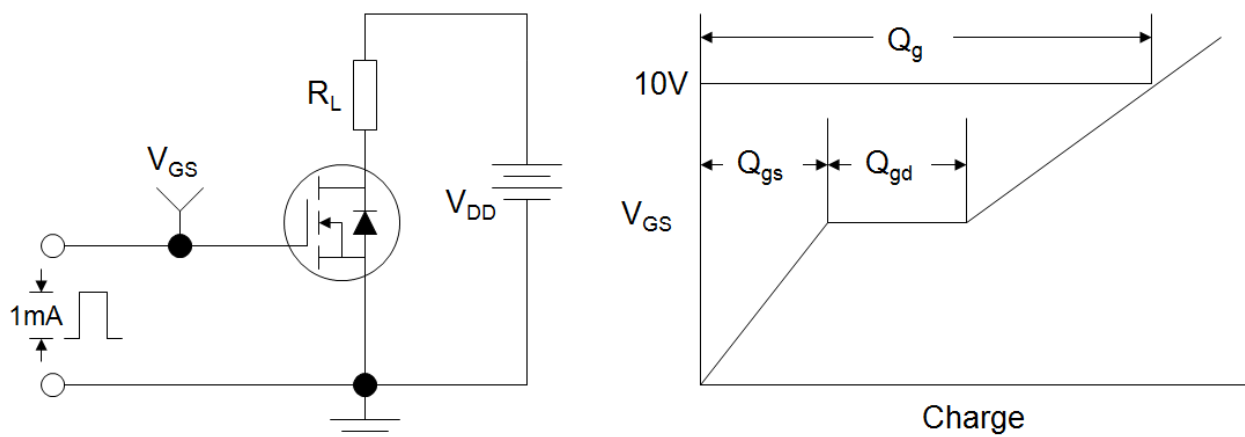
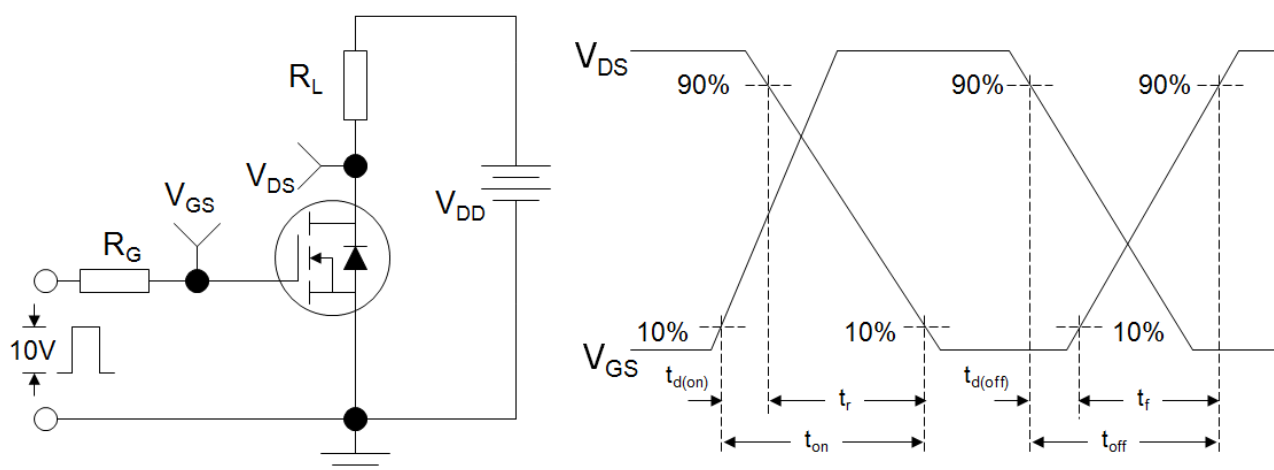
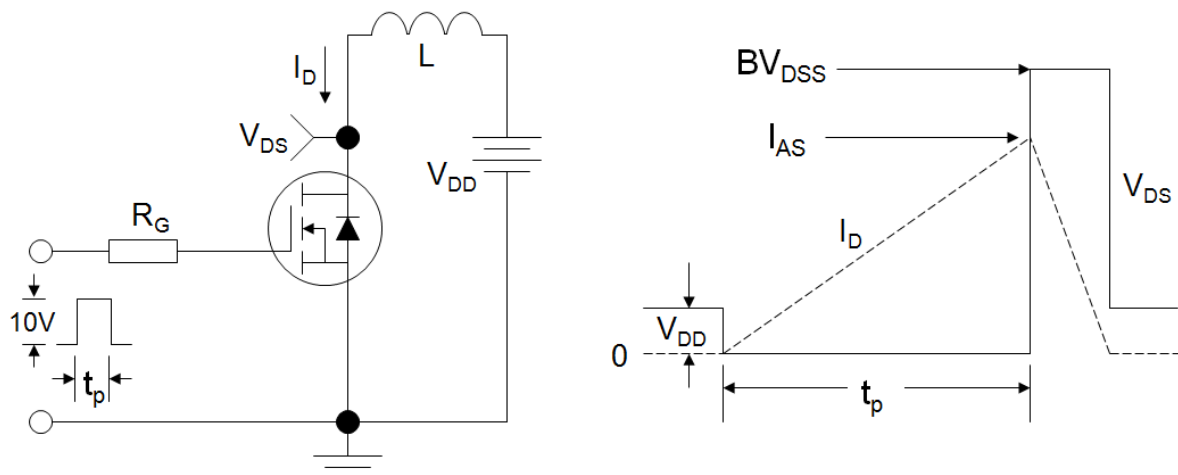
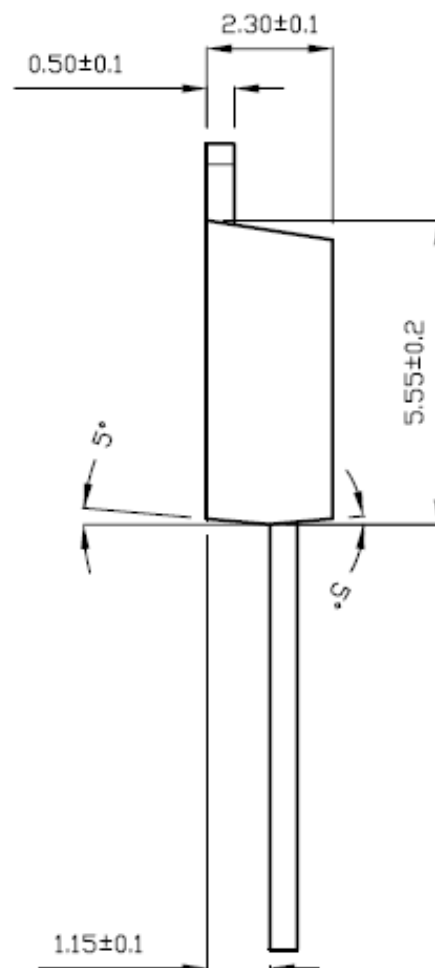
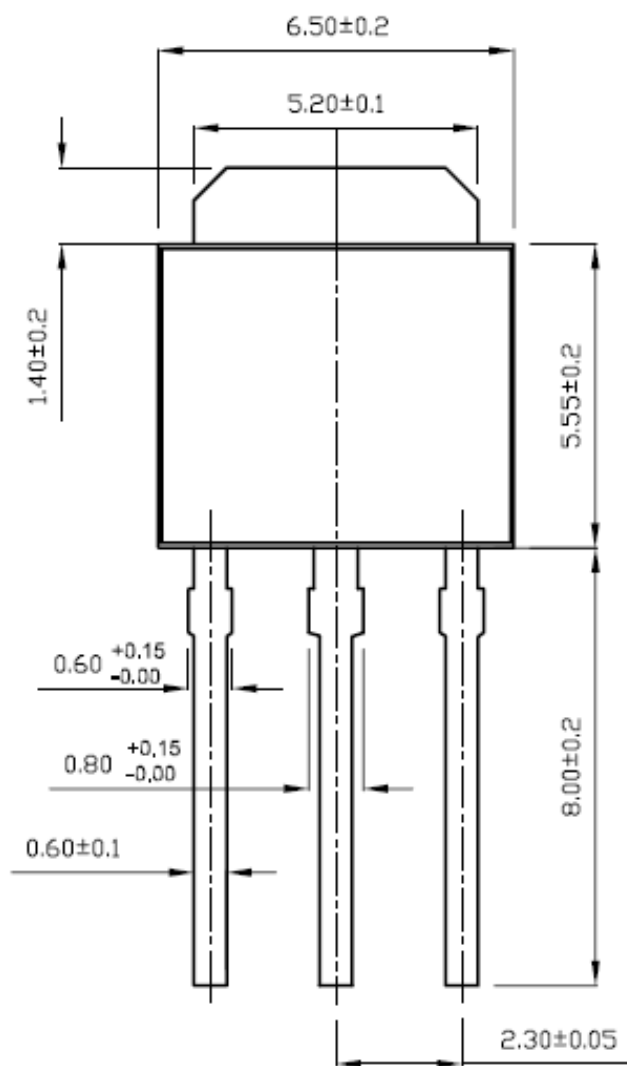

Fig.7 Capacitance

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


TO-251



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