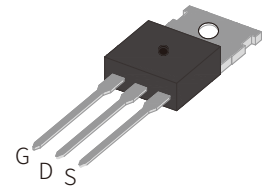


FEATURES

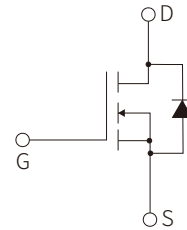
- | Low Gate Charge
- | Low Crss
- | Improved dv/dt Capability
- | Improved ESD Capability
- | 100% Avalanche energy test



TO-220C

APPLICATION

- | High efficiency swith mode power supplies
- | Electronic lamp ballasts
- | UPS



Schematic Symbol

APPROVALS

- RoHS** | Compliance with 2011/65/EU
- HF** | Compliance with IEC61249-2-21:2003

ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	800	V
Continuous Drain Current	I _D	T _C =25°C	10*
		T _C =100°C	5*
Plused Drain Current ^(note1)	I _{DM}	30	A
Gate-Source Voltage	V _{GS}	±30	V
Avalanche Current ^(note1)	I _{AR}	10	A
Repetitive Avalanche Energy ^(note1)	E _{AR}	18	mJ
Single Pulsed Avalanche Energy ^(note2)	E _{AS}	418	mJ
Peak Diode Recovery ^(note3)	dv/dt	4.5	V/ns
Power Dissipation T _C =25°C	P _D	140	W
Power Dissipation Derating Factor Above 25°C	P _{D(DF)}	1.12	W/°C
Maximum Temperature for Soldering	T _L	300	°C
Operating Junction Temperature Range	T _J	150	°C
Storage Temperature Range	T _{STG}	-55 to +150	°C
Thermal Resistance, Junction to Case	R _{thjc}	0.89	°C/W
Thermal Resistance, Junction to Ambient	R _{thja}	62.5	°C/W

* Drain current limited by maximum junction temperature

ELECTRICAL CHARACTERISTICS (T_A=25°C)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit	
Off Characteristics							
Drain-source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	800			V	
Breakdown voltage temperature coefficient	$\Delta BV_{DSS} / \Delta T_J$	$I_D=250\mu A$, referenced to 25°C		0.7		V/°C	
Zero Gate Voltage Drain current	I_{DSS}	$V_{DS}=800V, V_{GS}=0V, T_C=25^\circ C$			1	μA	
		$V_{DS}=640V, T_C=125^\circ C$			100	μA	
Gate Leakage Current	I_{GSS}	$V_{GS}=30V, V_{DS}=0V$			100	nA	
		$V_{GS}=-30V, V_{DS}=0V$			-100	nA	
On Characteristics							
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0		4.0	V	
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=4.5A$			1.4	Ω	
Forward Transconductance	g_{FS}	$V_{DS}=40V, I_D=4A$ (note 4)		5.0		S	
Dynamic Characteristics							
Input capacitance	C_{iss}	$V_{DS} = 25V, V_{GS} = 0V, f=1MHz$		1300		pF	
Output capacitance	C_{oss}				125		pF
Reverse Transfer capacitance	C_{rss}				12		pF
Turn-on Delay Time	td(on)	$V_{DD}=400V, I_D=10A, R_G=25\Omega$ (note 4,5)		35		ns	
Turn-On rise time	tr				100		ns
Turn-off Delay Time	td(off)				50		ns
Turn-off Fall time	tf				60		ns
Total gate charge	Q_g				27		nC
Gate-source charge	Q_{gs}	$V_{DS}=640V, I_D=10A, V_{GS}=10V$ (note 4,5)			8.2	nC	
Gate-drain charge	Q_{gd}				11		nC
Maximum Continuous Drain-Source Diode Forward Current	I_S				10	A	
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				30	A	
Drain-Source Diode Forward Voltage	V_{SD}	$I_S=10A, V_{GS}=0V$			1.4	V	
Reverse recovery time	Trr	$I_S=10A, V_{GS}=0V,$ $di_f/dt=100A/\mu s$ (note 4)		650		ns	
Reverse recovery Charge	Qrr				7.0		μC

Notes:

1: Pulse width limited by maximum junction temperature
 3: $I_{SD} \leq 10A, di/dt \leq 300A/\mu s, V_{DD} \leq BV_{DSS}$, Starting $T_J=25^\circ C$
 5: Essentially independent of operating temperature

2: $L=8mH, I_{AS}=10A, V_{DD}=50V, R_G=25\Omega$, Starting $T_J=25^\circ C$
 4: Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

CHARACTERISTIC CURVES

Fig.1 On-State Characteristics

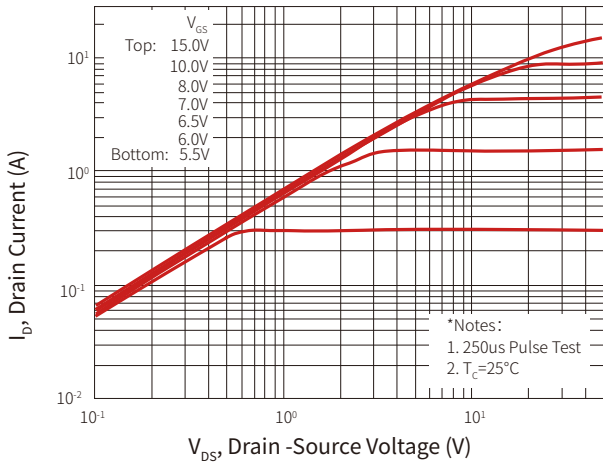


Fig.2 Transfer Characteristics

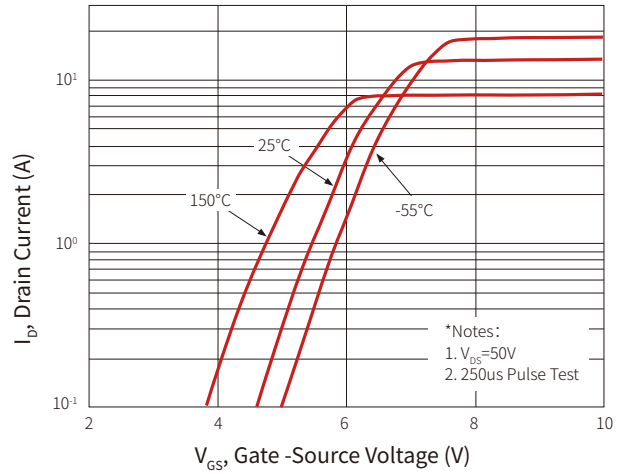


Fig.3 Capacitance Characteristics

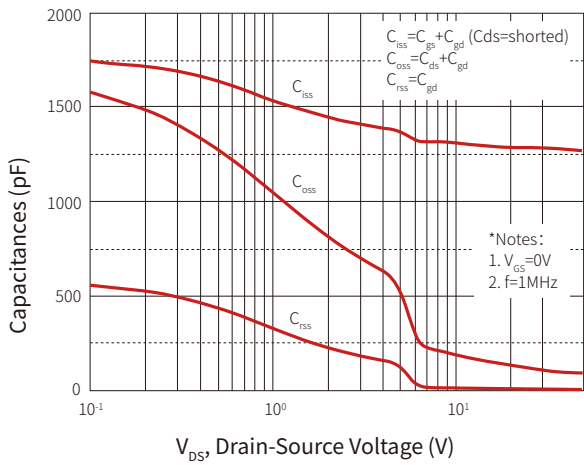


Fig. 4 Gate Charge Characteristics

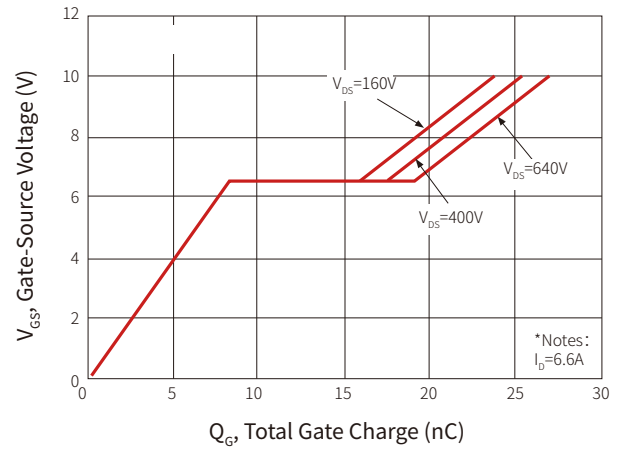


Fig.5 Maximum Safe Operating Area

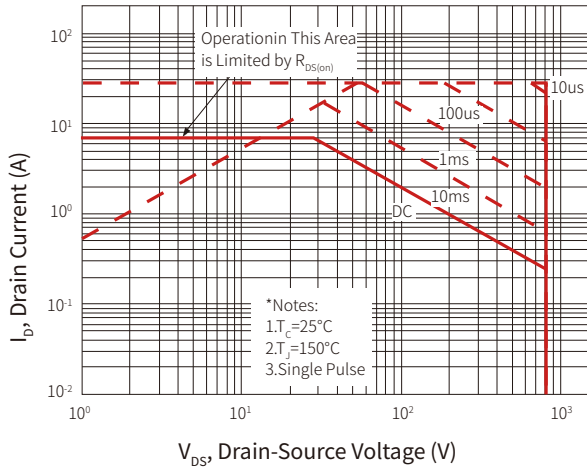


Fig.6 Maximum Drain Current vs Case Temperature

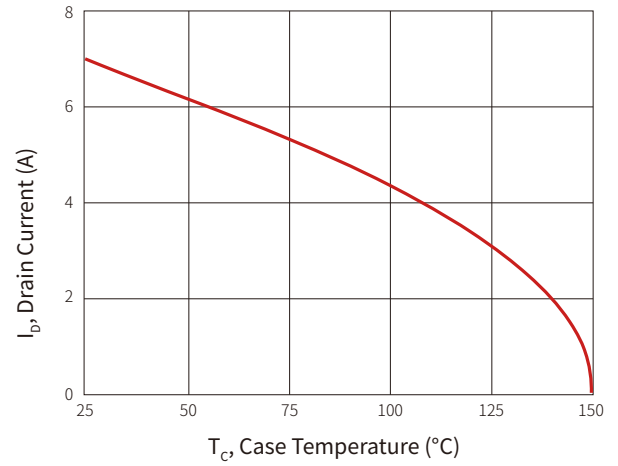


Fig.9 Transient Thermal Response Curve

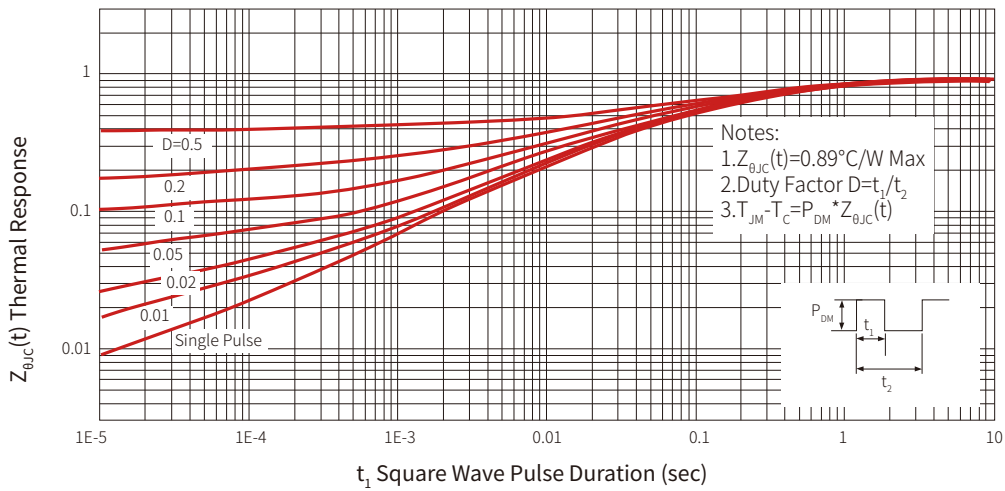


Fig.8 Resistive Switching Test Circuit & Waveforms

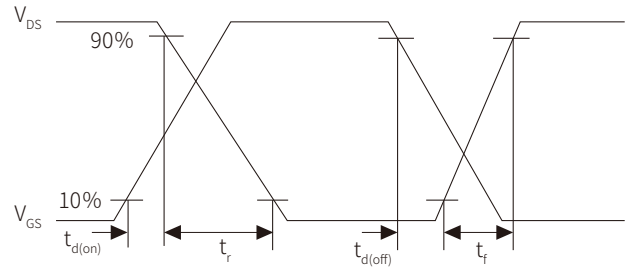
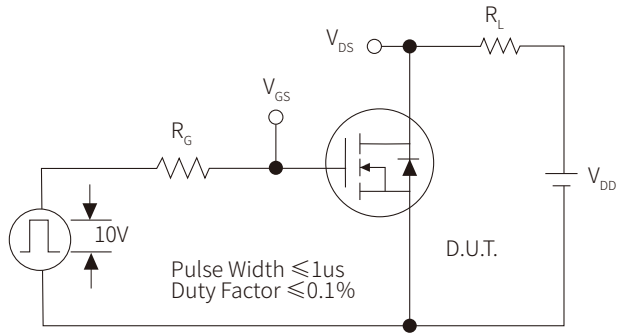


Fig.9 Gate Charge Test Circuit & Waveform

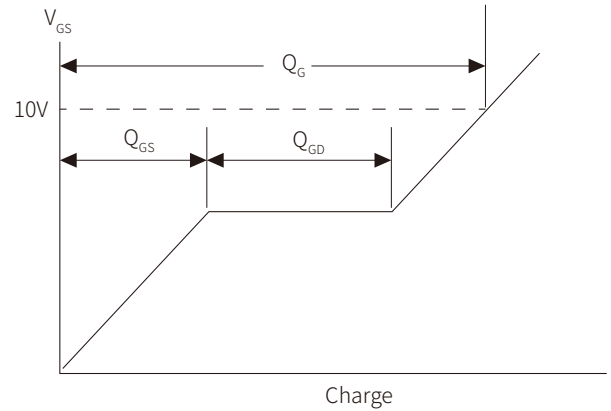
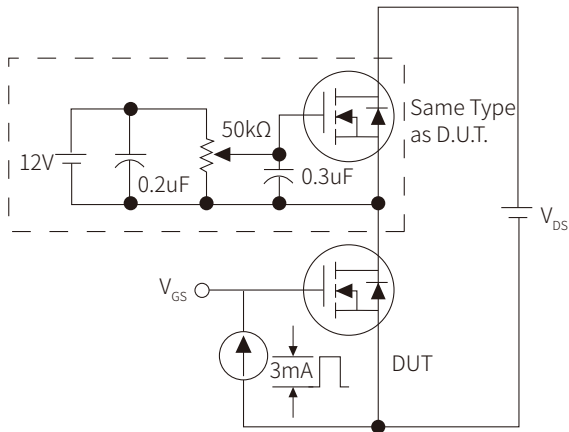
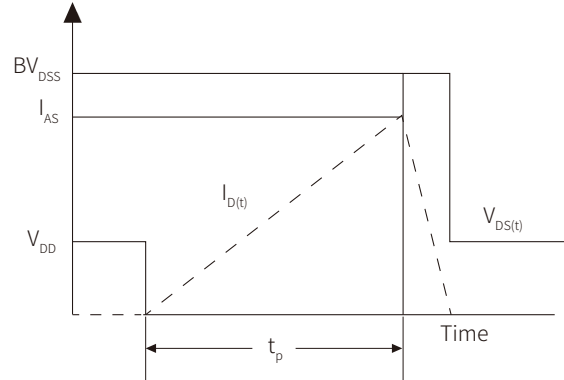
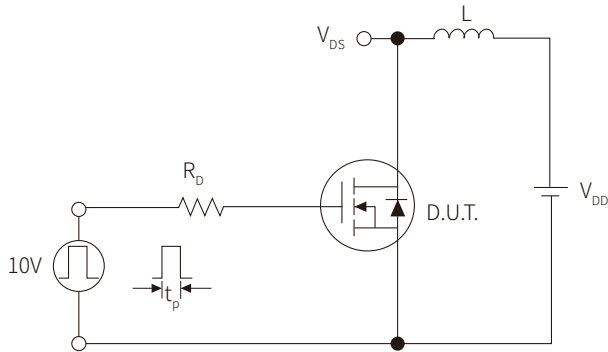
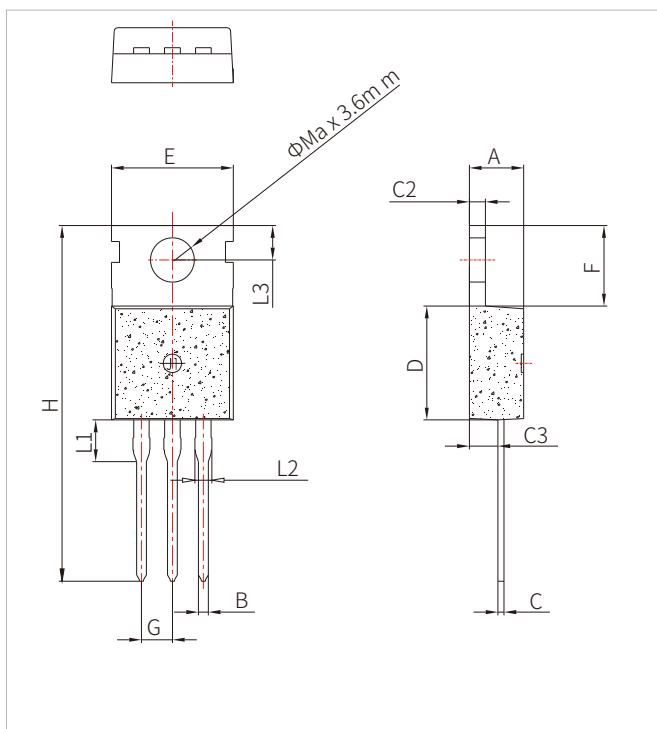



Fig.10 Unclamped Inductive Switching Test Circuit & Waveforms


TO-220C PACKAGE MECHANICAL DATA



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.30		4.70	0.169		0.185
B	0.70		0.90	0.028		0.035
C	0.45		0.60	0.018		0.024
C2	1.23		1.32	0.048		0.052
C3	2.20		2.60	0.087		0.102
D	8.80		10.0	0.346		0.394
E	9.90		10.3	0.390		0.406
F	6.30		6.90	0.248		0.272
G		2.54			0.1	
H	28.0		30.0	1.102		1.181
L1		3.10			0.122	
L2	1.14		1.70	0.045		0.067
L3	2.65		2.95	0.104		0.116
Φ		3.6			0.142	

ORDERING INFORMATION

Part Number	Package	Marking	Qty/pcs		
			Tube	Inner Box	Carton
SNM10N80C	TO-220C	 10N80 XXXX	50	1000	5000

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