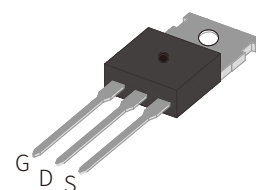


FEATURES

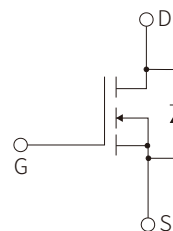
- | Low Gate Charge
- | Low Crss
- | Improved dv/dt Capability
- | Improved ESD Capability
- | 100% Avalanche energy test

APPLICATION

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



TO-220C



Schematic Symbol

APPROVALS

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

ABSOLUTE MAXIMUM RATINGS ($T_A=25^{\circ}\text{C}$)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	800	V
Continuous Drain Current	$T_C=25^{\circ}\text{C}$	I_D	10*	A
	$T_C=100^{\circ}\text{C}$		5*	A
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 $T_C=25^{\circ}\text{C}$		P_D	140	W
Power Dissipation Derating Factor Above 25°C		$P_{D(DF)}$	1.12	W/ $^{\circ}\text{C}$
Maximum Temperature for Soldering		T_L	300	$^{\circ}\text{C}$
Operating Junction Temperature Range		T_J	150	$^{\circ}\text{C}$
Storage Temperature Range		T_{STG}	-55 to +150	$^{\circ}\text{C}$
Thermal Resistance, Junction to Case		R_{thjc}	0.89	$^{\circ}\text{C/W}$
Thermal Resistance, Junction to Ambient		R_{thja}	62.5	$^{\circ}\text{C/W}$

* 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	$V_{DS}=640V, I_D=10A, V_{GS}=10V$ (note 4,5)		27		nC
Gate-source charge	Q_{gs}			8.2		nC
Gate-drain charge	Q_{gd}			11		nC
Maximum Continuous Drain-Source Diode Forward Current	I_S	$I_S=10A, V_{GS}=0V$			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

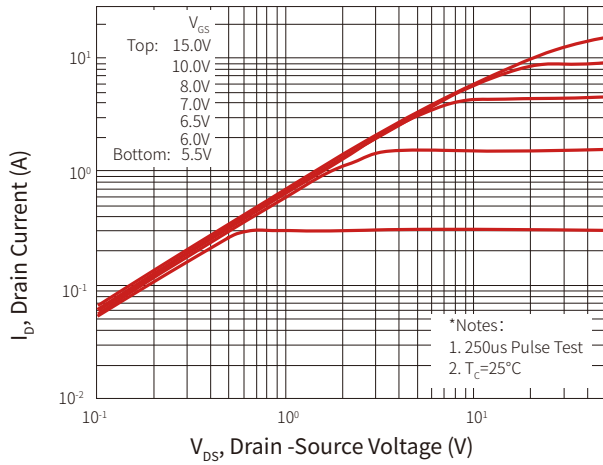


Fig.2 Transfer Characteristics

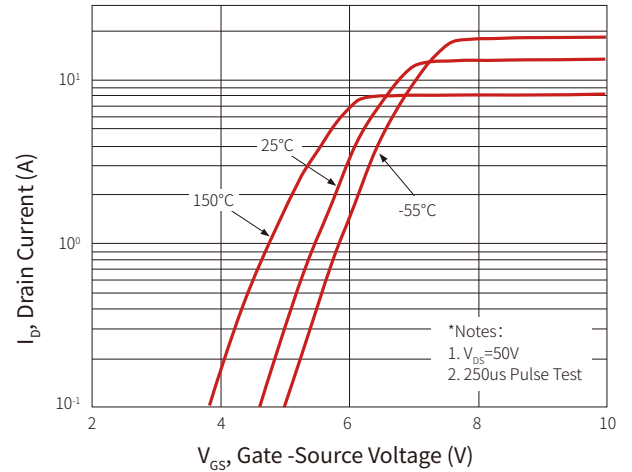


Fig.3 Capacitance Characteristics

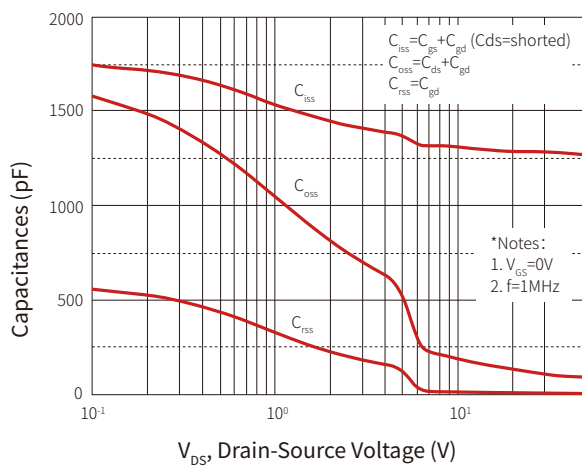


Fig. 4 Gate Charge Characteristics

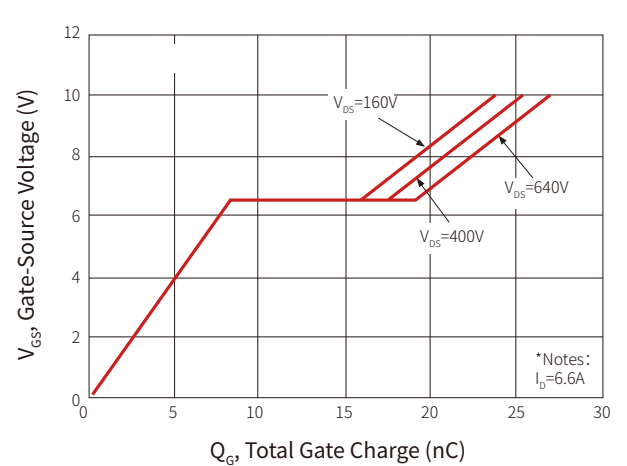


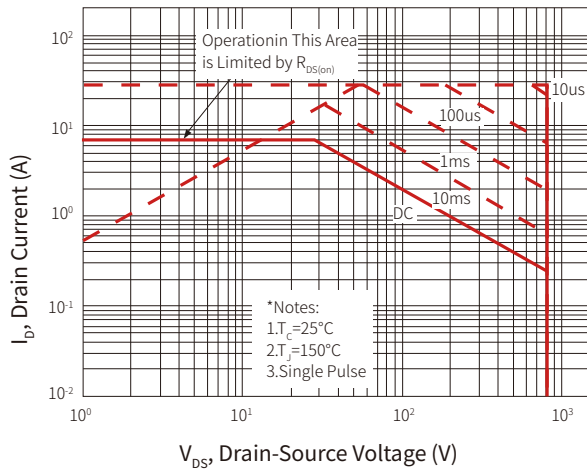
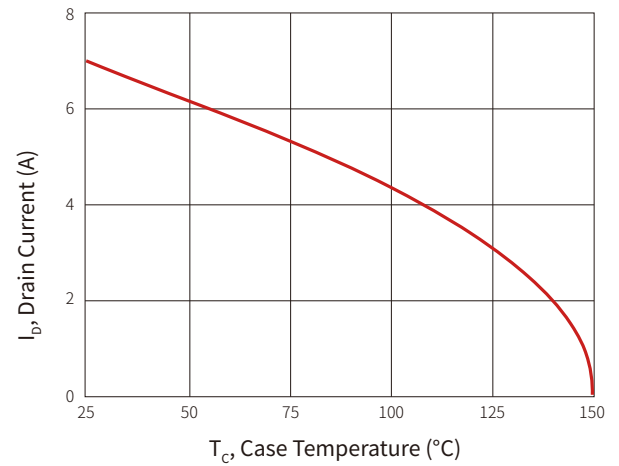
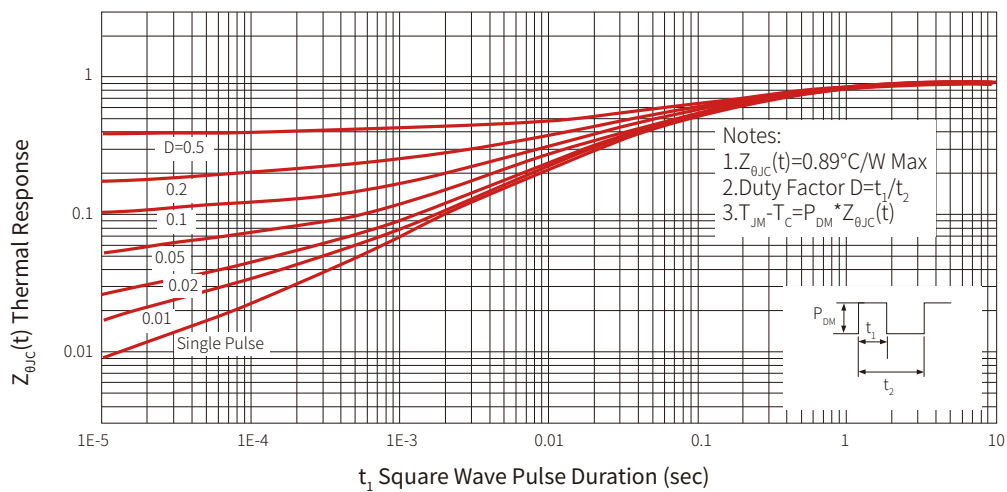
Fig.5 Maximum Safe Operating Area

Fig.6 Maximum Drain Current vs Case Temperature

Fig.9 Transient Thermal Response Curve


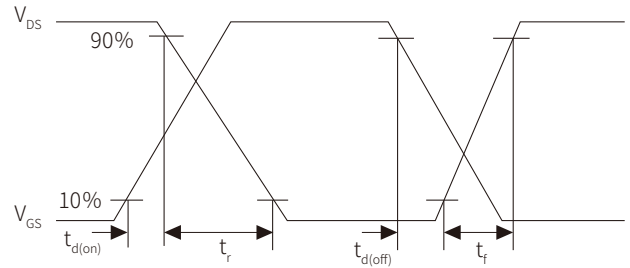
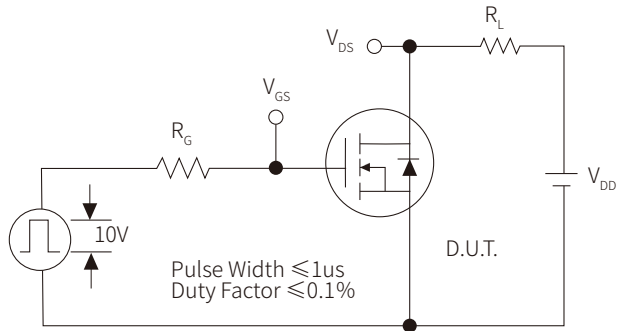
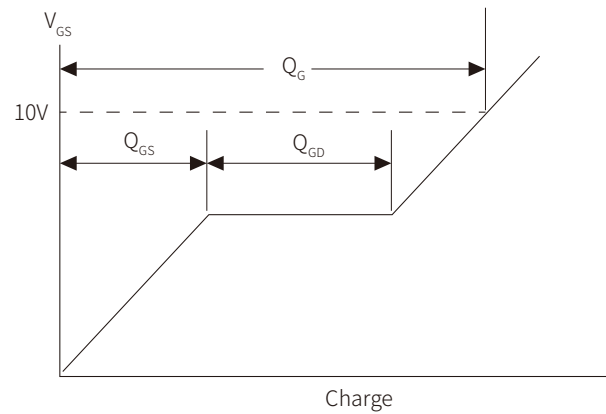
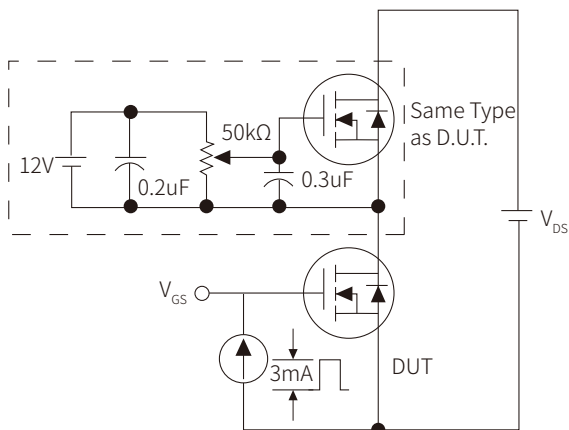
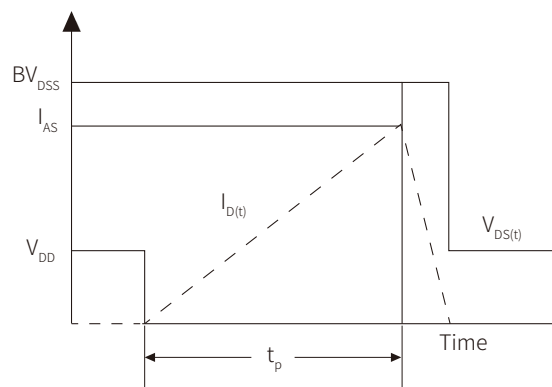
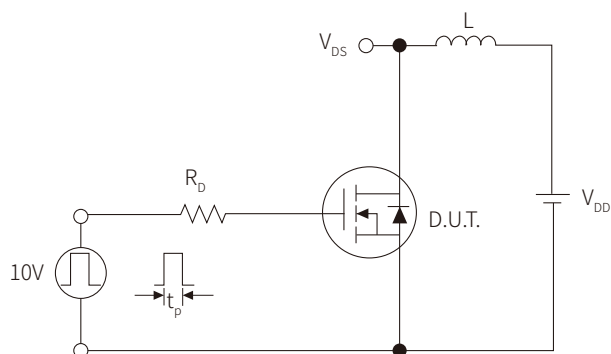
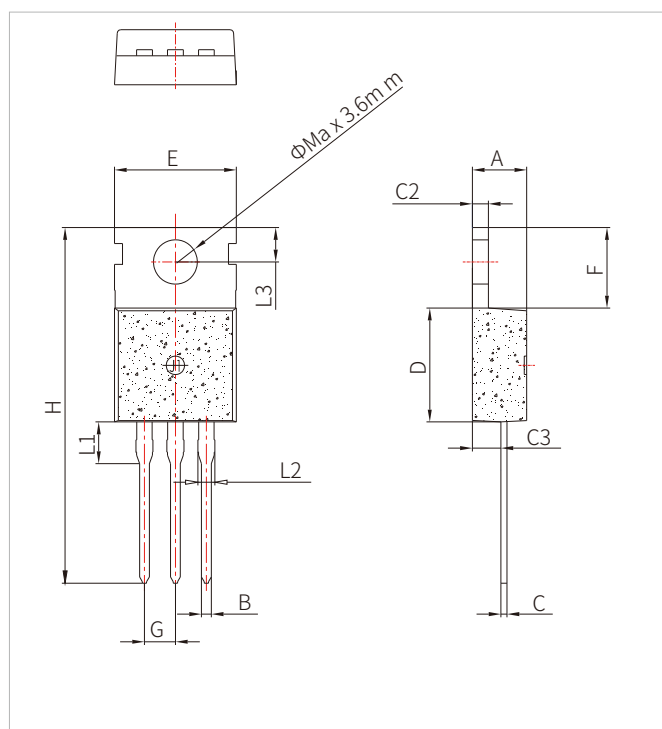
Fig.8 Resistive Switching Test Circuit & Waveforms

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		3.65			0.144	
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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