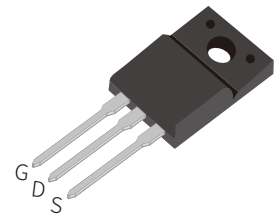


FEATURES

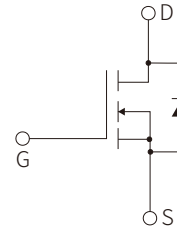
- | Low Gate Charge
- | Low Crss
- | Fast Switching
- | Improved dv/dt and ESD Capability
- | 100% Avalanche energy test



TO-220F

APPLICATION

- | High Frequency Switched-Mode Power Supply
- | 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	6.0*
		T _C =100°C	4.0*
Pulsed Drain Current ^(note1)	I _{DM}	24	A
Gate-Source Voltage	V _{GS}	±30	V
Avalanche Current ^(note1)	I _{AR}	6.0	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	49	W
Power Dissipation Derating Factor Above 25°C	P _{D(DF)}	0.39	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 _{th(j-c)}	2.55	°C/W
Thermal Resistance, Junction to Ambient	R _{th(j-a)}	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 =250μA	800			V	
Breakdown Voltage Temperature Coefficient	ΔBV _{DSS} / ΔT _J	I _D =250μA, referenced to 25°C		0.7		V/°C	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =800V, V _{GS} =0V, T _C =25°C			1.0	μA	
		V _{DS} =640V, T _C =125°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 =250μA	3.0		5.0	V	
Drain-source On-resistance	R _{DS(on)}	V _{GS} =10V, I _D =3A		2.0	2.5	Ω	
Forward Transconductance	g _{fs}	V _{DS} =40V, I _D =3A(note4)		3.0		S	
Dynamic Characteristics							
Input Capacitance	C _{iss}	V _{DS} = 25V, V _{GS} = 0V, f=1.0MHz		1400		pF	
Output Capacitance	C _{oss}				135		pF
Reverse Transfer Capacitance	C _{rss}				10		pF
Turn-on Delay Time	t _{d(on)}	V _{DD} =400V, I _D =6A, R _G =25Ω (note 4,5)		35		ns	
Turn-on Rise Time	t _r				110		ns
Turn-off Delay Time	t _{d(off)}				50		ns
Turn-off Fall Time	t _f				60		ns
Total Gate Charge	Q _g	V _{DS} =640V, I _D =6A, V _{GS} =10V (note 4,5)		30		nC	
Gate-Source Charge	Q _{gs}				8.5		nC
Gate-Drain Charge	Q _{gd}				12		nC
Maximum Continuous Drain-source Diode Forward Current	I _S				6.0	A	
Maximum Pulsed Drain-source Diode Forward Current	I _{SM}				24	A	
Drain-source Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =6A			1.4	V	
Reverse Recovery Time	t _{rr}	V _{GS} =0V, I _S =6A di _F /dt=100A/μs(note 4)		650		ns	
Reverse Recovery Charge	Q _{rr}				7.0		μC

Notes:

1: Pulse width limited by maximum junction temperature
 3: I_{SD} ≤ 6A, di/dt ≤ 300A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J=25°C
 5: Essentially independent of operating temperature

2: L=16mH, I_{AS}=6A, V_{DD}=50V, R_G=25Ω, Starting T_J=25°C
 4: Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%

CHARACTERISTIC CURVES

Fig.1 On-State Characteristics

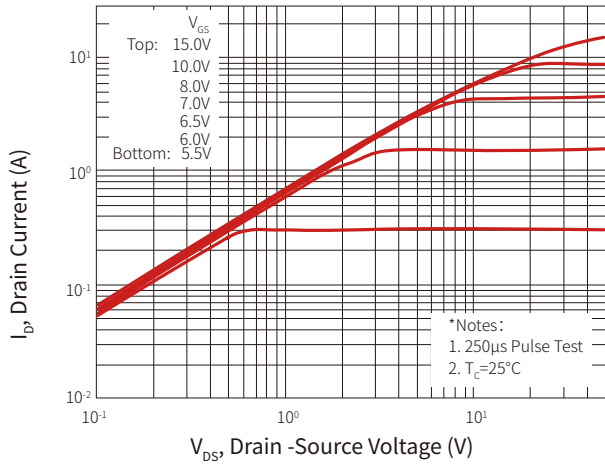


Fig.2 Transfer Characteristics

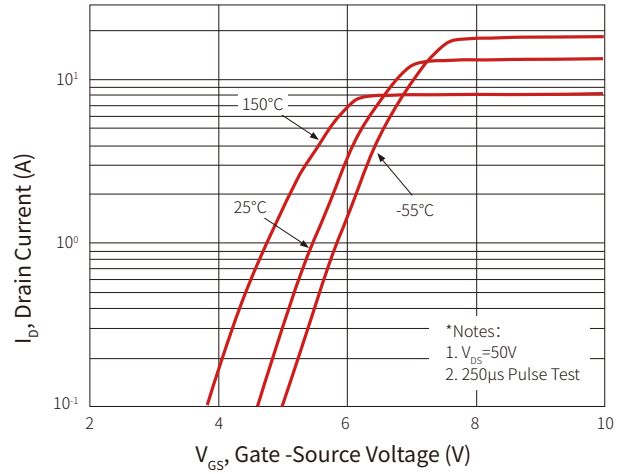


Fig.3 Breakdown Voltage Variation vs Temperature

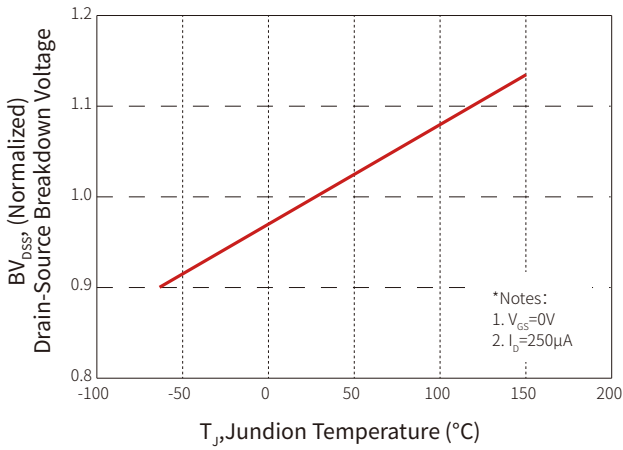


Fig. 4 On-Resistance Variation vs Temperature

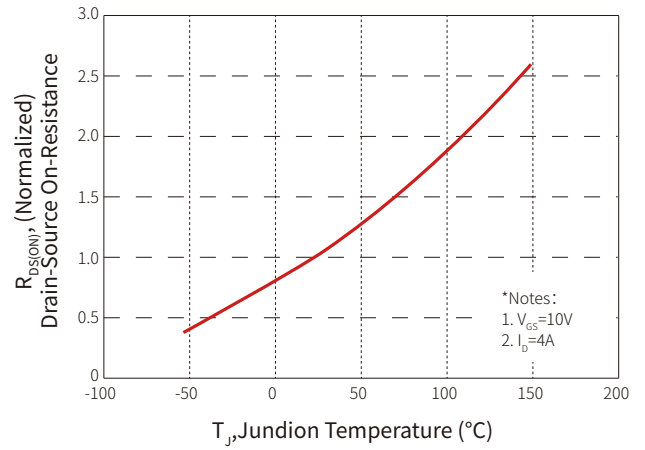


Fig.5 Capacitance Characteristics

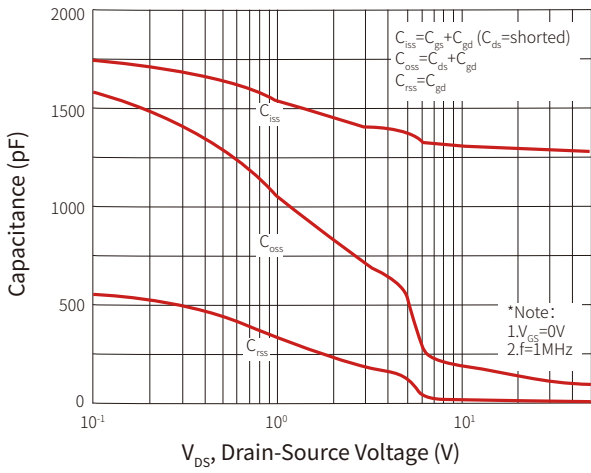


Fig. 6 Gate Charge Characteristics

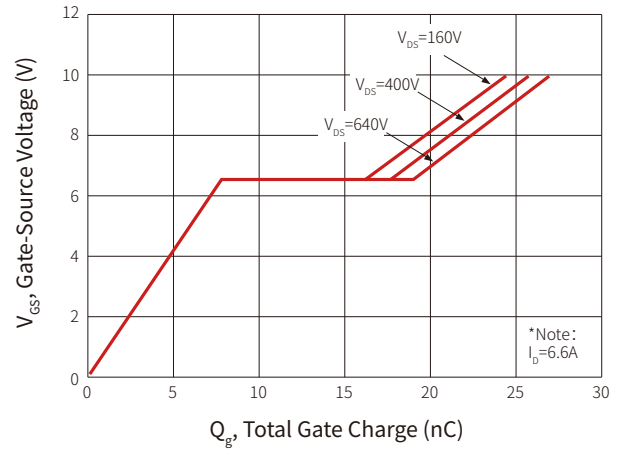


Fig.7 Maximum Safe Operating Area

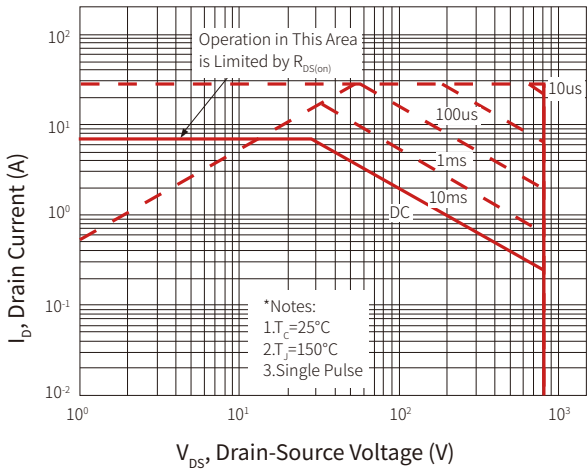


Fig.8 Maximum Drain Current vs Case Temperature

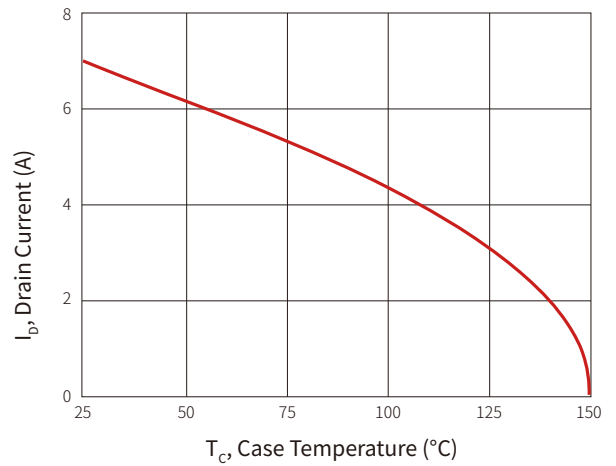


Fig.9 Transient Thermal Response Curve

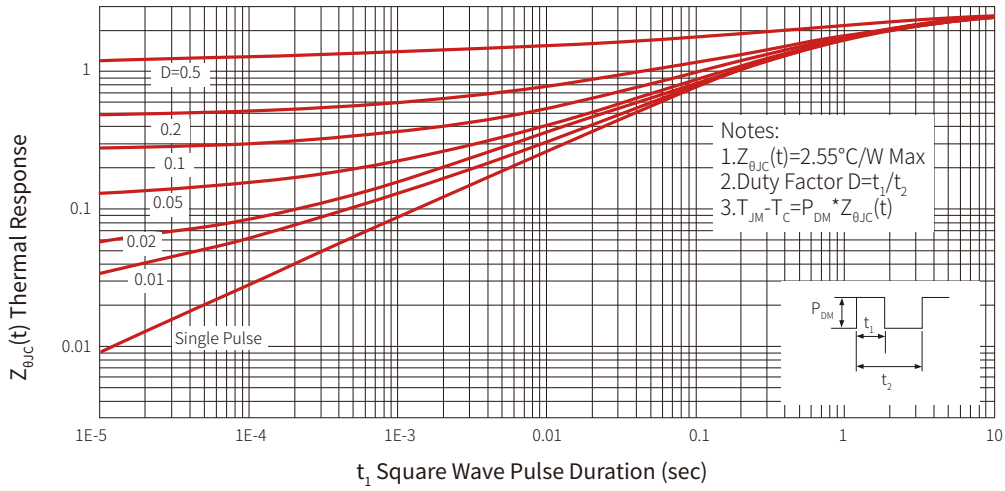


Fig.10 Resistive Switching Test Circuit & Waveforms

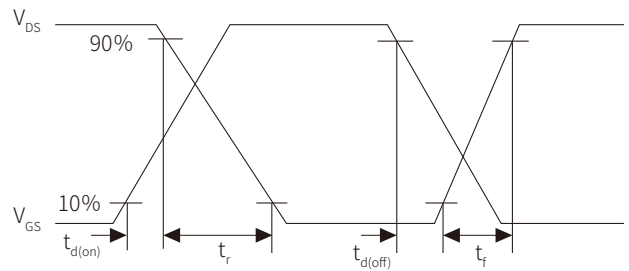
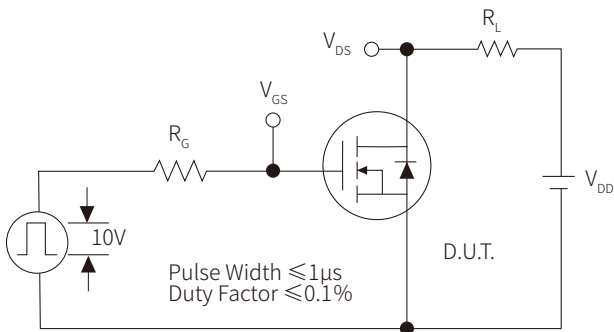


Fig.11 Gate Charge Test Circuit & Waveform

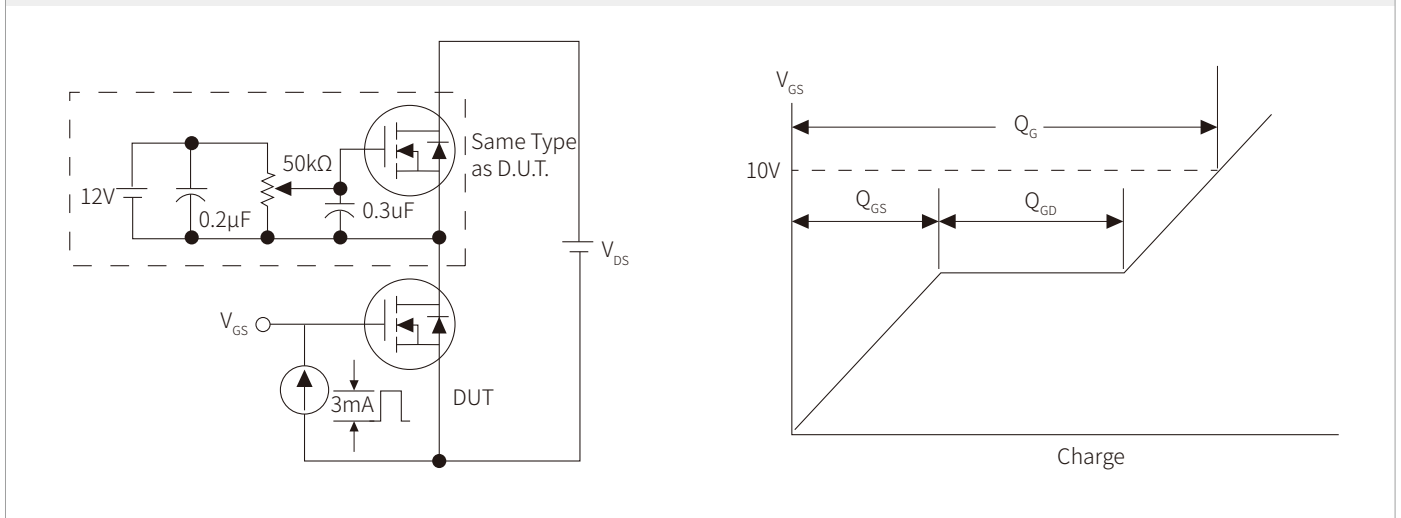
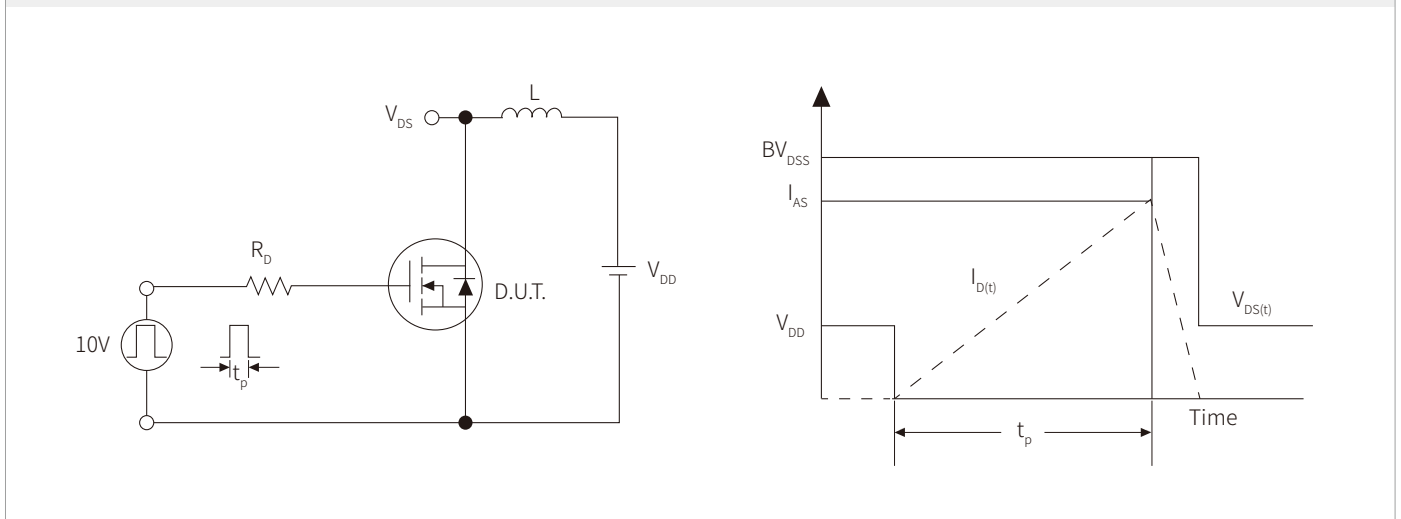
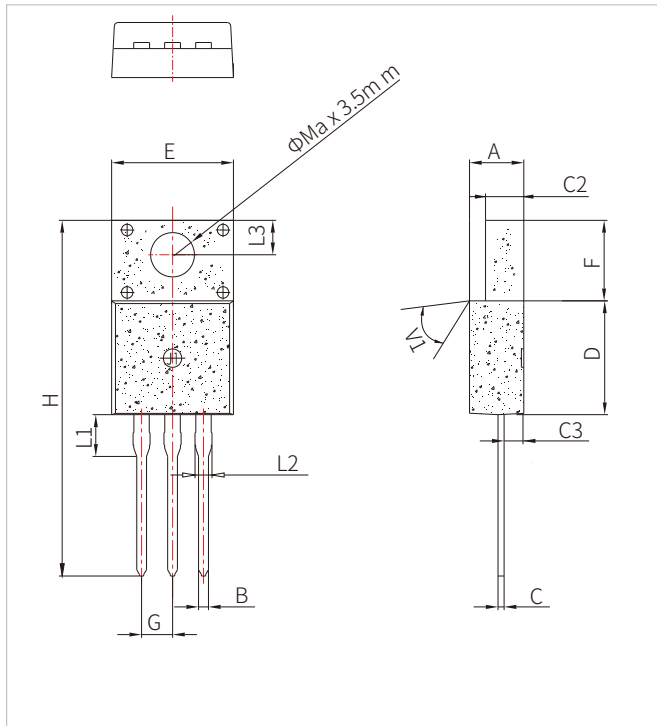


Fig.12 Unclamped Inductive Switching Test Circuit & Waveforms




TO-220F PACKAGE MECHANICAL DATA



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.90	0.173		0.193
B	0.74	0.80	0.83	0.029		0.033
C	0.45		0.75	0.018		0.030
C2	2.40		2.70	0.094		0.106
C3	2.60		3.00	0.102		0.118
D	8.80		9.30	0.346		0.366
E	9.70		10.4	0.382		0.409
F	6.40		7.00	0.252		0.276
G		2.54			0.1	
H	28.0		30.0	1.102		1.181
L1		3.55			0.140	
L2	1.14		1.70	0.045		0.067
L3		3.30			0.130	
V1		45°			45°	

ORDERING INFORMATION

Part Number	Component Package	Marking	QTY/Tube	Box	Carton
SNM6N80F	TO-220F	 6N80 XXXX	50PCS	1000PCS	5000PCS

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