

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

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
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On Characteristics

V_{GS}	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	2.0	--	4.0	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS} = 10\text{ V}, I_D = 9\text{ A}$	--	0.14	0.17	Ω
g_{fs}	Forward transfer conductance(note 3)	$V_{DS} = 10\text{ V}, I_D = 10\text{ A}$	--	35	--	S

Off Characteristics

BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	200	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 200\text{ V}, V_{GS} = 0\text{ V}$	--	--	1	μA
I_{GSSF}	Gate-Body Leakage Current,Forward	$V_{GS} = 30\text{ V}, V_{DS} = 0\text{ V}$	--	--	100	nA
I_{GSSR}	Gate-Body Leakage Current,Reverse	$V_{GS} = -30\text{ V}, V_{DS} = 0\text{ V}$	--	--	-100	nA

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V},$ $f = 1.0\text{ MHz}$	--	965	--	pF
C_{oss}	Output Capacitance		--	227	310	pF
C_{rss}	Reverse Transfer Capacitance		--	55	71	pF

Switching Characteristics

$t_{d(on)}$	Turn-On Time	$V_{DS} = 125\text{ V}, I_D = 18\text{ A},$ $R_G = 25\text{ }\Omega$ (Note 3,4)	--	15	--	ns
t_r	Turn-On Rise Time		--	130	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	135	--	ns
t_f	Turn-Off Fall Time		--	105	--	ns
Q_g	Total Gate Charge	$V_{DS} = 160\text{ V}, I_D = 18\text{ A},$ $V_{GS} = 10\text{ V}$ (Note 3,4)	--	22	28	nC
Q_{gs}	Gate-Source Charge		--	6.6	--	nC
Q_{gd}	Gate-Drain Charge		--	7.2	--	nC

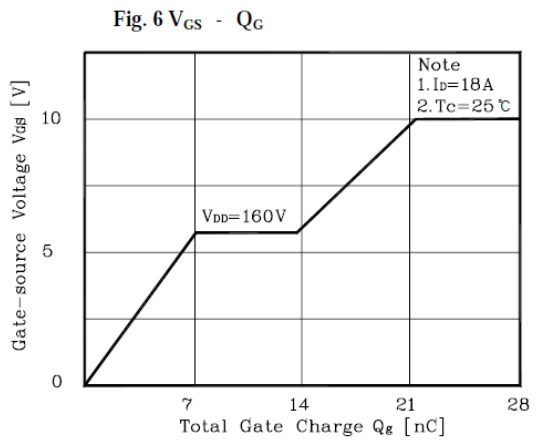
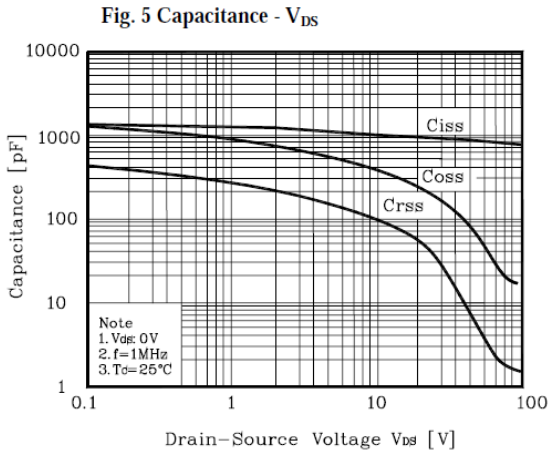
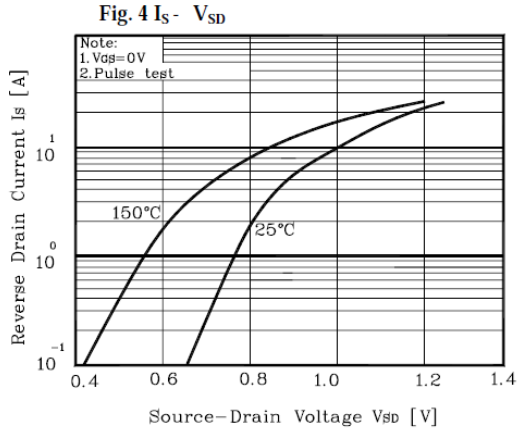
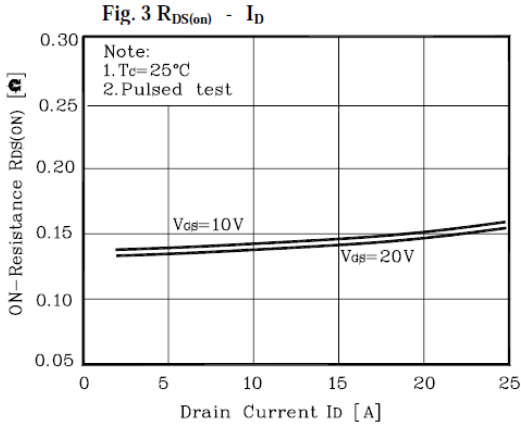
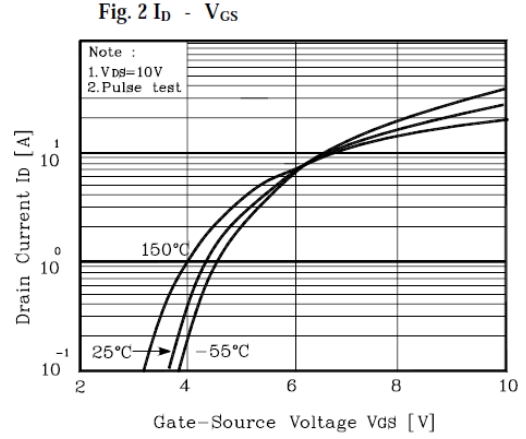
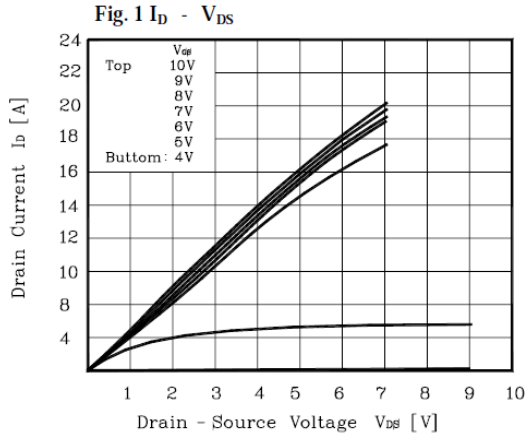
Source-Drain Diode Maximum Ratings and Characteristics

I_S	Continuous Source-Drain Diode Forward Current	--	--	18	A	
I_{SM}	Pulsed Source-Drain Diode Forward Current (Note 1)	--	--	72		
V_{SD}	Source-Drain Diode Forward Voltage	$I_S = 18\text{ A}, V_{GS} = 0\text{ V}$	--	--	1.4	V
t_{rr}	Reverse Recovery Time	$I_S = 18\text{ A}, V_{GS} = 0\text{ V}$	--	208	--	ns
Q_{rr}	Reverse Recovery Charge	$di_F/dt = 100\text{ A}/\mu\text{s}$ (Note 4)	--	1.63	--	μC

Note:

1. Repeated rating: Pulse width limited by maximum junction temperature
2. $L=2.1\text{ mH}, I_{AS}=18\text{ A}, V_{DD}=50\text{ V}, R_G=25\text{ }\Omega,$ Starting $T_J=25\text{ }^\circ\text{C}$
3. Pulse test: Pulse width $\leq 300\text{ }\mu\text{s}$, Duty cycle $\leq 2\%$
4. Essentially independent of operating temperature

Typical Characteristics



Typical Characteristics

Fig. 7 $V_{DSS} - T_J$

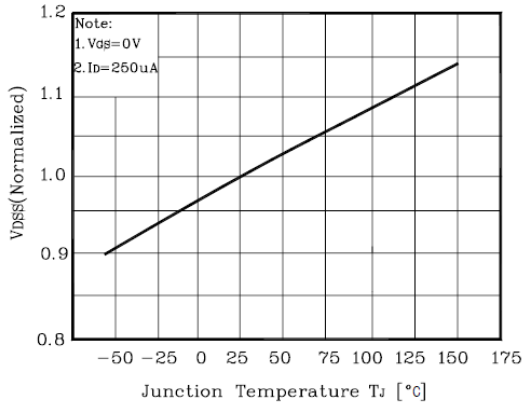


Fig. 8 $R_{DS(on)} - T_J$

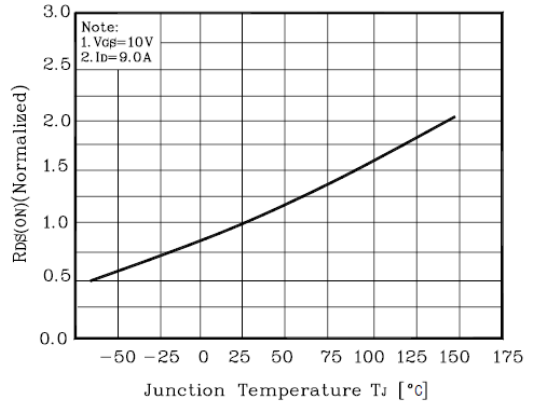


Fig. 9 $I_D - T_C$

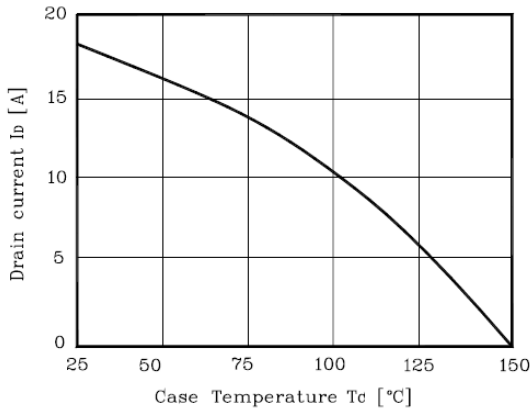


Fig. 10 Safe Operating Area

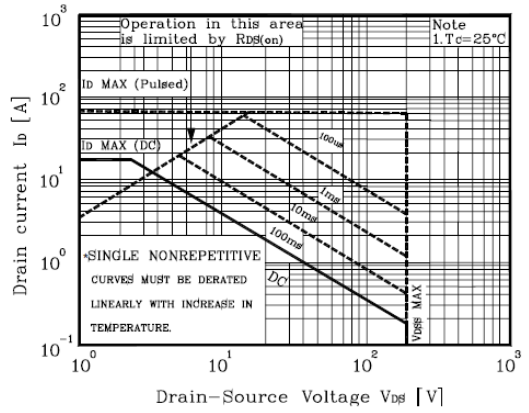


Fig 11. Gate Charge Test Circuit & Waveform

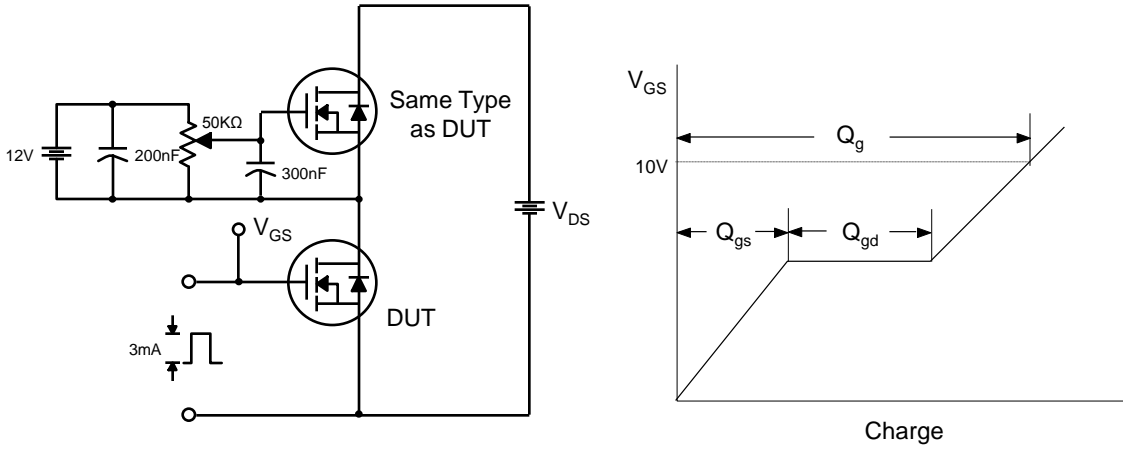


Fig 12. Resistive Switching Test Circuit & Waveforms

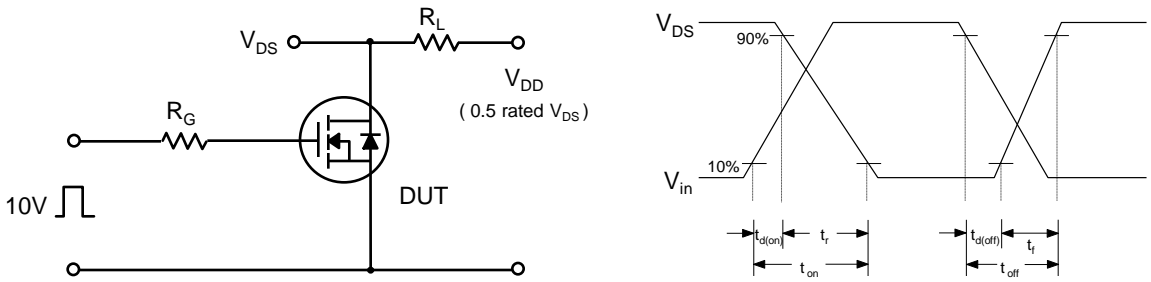


Fig 13. Unclamped Inductive Switching Test Circuit & Waveforms

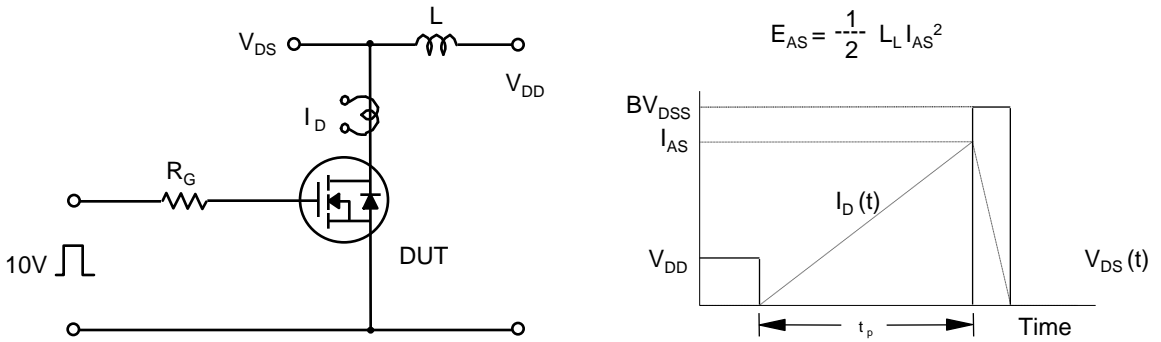
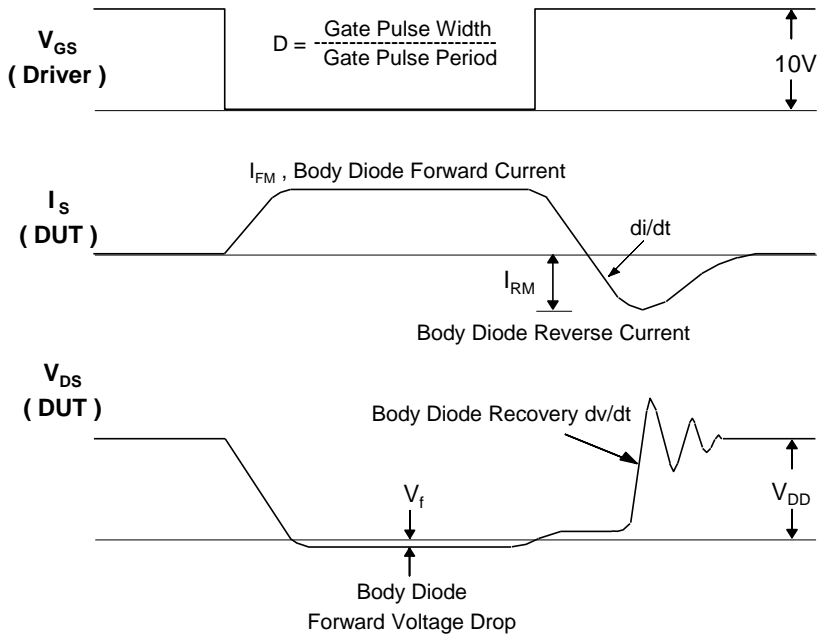
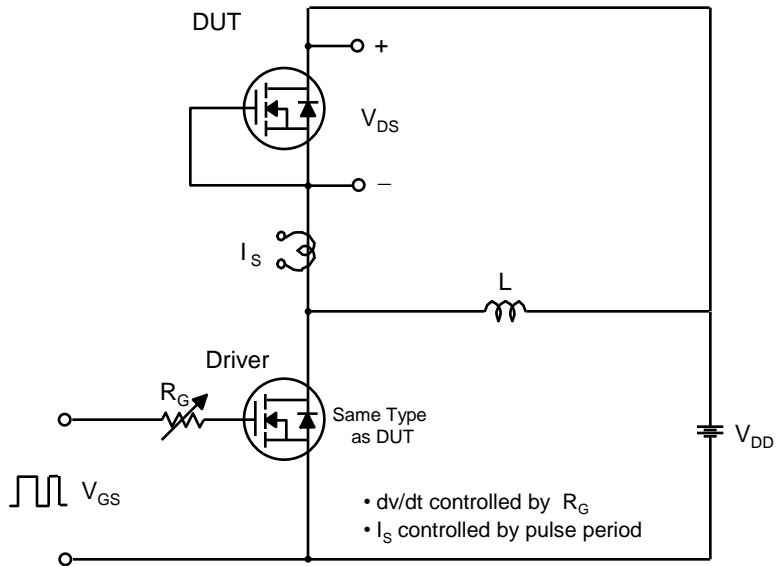
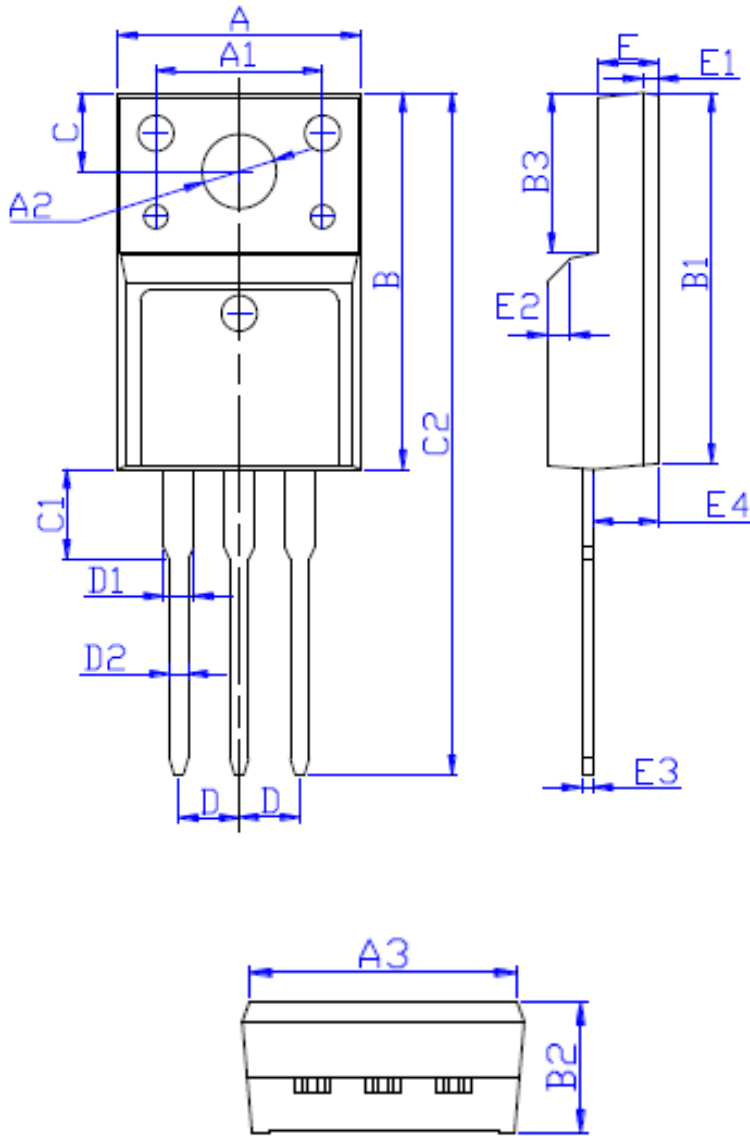


Fig 14. Peak Diode Recovery dv/dt Test Circuit & Waveforms



Package Dimension

TO-220F



DIM	MILLIMETERS
A	10.16 ± 0.30
A1	7.00 ± 0.20
A2	3.12 ± 0.20
A3	9.70 ± 0.30
B	15.90 ± 0.50
B1	15.60 ± 0.50
B2	4.70 ± 0.30
B3	6.70 ± 0.30
C	3.30 ± 0.25
C1	3.25 ± 0.30
C2	28.70 ± 0.50
D	Typical 2.54
D1	1.47 (MAX)
D2	0.80 ± 0.20
E	2.55 ± 0.25
E1	0.70 ± 0.25
E2	1.0 × 45°
E3	0.50 ± 0.20
E4	2.75 ± 0.30