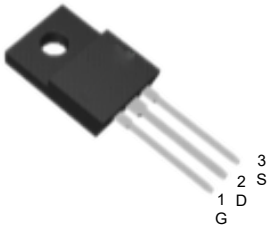
Features

- 700V/10A
  $R_{DS(ON)}$=0.38Ω(typ.)@V_{GS}=10V
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

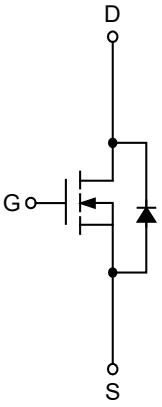
Applications

- AC/DC Power Conversion in Switched Mode Power Supplies (SMPS).
- Uninterruptible Power Supply (UPS).
- Adapter.

Pin Description



TO-220FP



N-Channel MOSFET

Absolute Maximum Ratings (T_A=25°C Unless Otherwise Noted)

Symbol	Parameter		Rating	Unit
Common Ratings				
V_{DSS}	Drain-Source Voltage		700	V
V_{GSS}	Gate-Source Voltage		±30	
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	
I_S	Diode Continuous Forward Current	T_C=25°C	10	A
I_D	Continuous Drain Current	T_C=25°C	10	A
		T_C=100°C	7.5	
I_{DM}[a]	Pulsed Drain Current	T_C=25°C	30	
P_D	Maximum Power Dissipation	T_C=25°C	31	W
		T_C=100°C	13	
$R_{\theta JC}$	Thermal Resistance-Junction to Case		4	°C/W
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		62.5	°C/W
I_{AS}[b]	Avalanche Current, Repetitive	L=10mH	4.7	A
E_{AS}[b]	Avalanche Energy, Single pulse	L=10mH	110	mJ

Note a : Pulse width limited by maximum junction temperature.
Note b : UIS tested and pulse width limited by maximum junction temperature (initial temperature T_j=25°C).

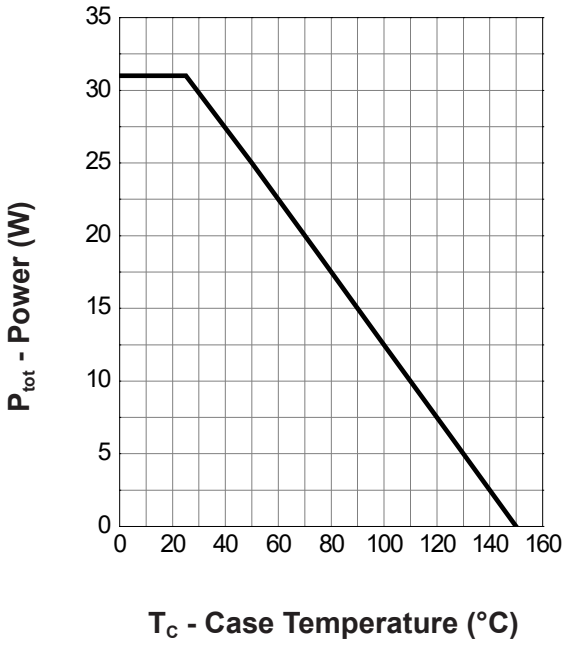
Electrical Characteristics (T_A = 25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	700	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=560V, V_{GS}=0V	-	-	1	μA
		T_J=85°C	-	-	30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	2.5	3.5	4.5	V
I_{GSS}	Gate Leakage Current	V_{GS}=±30V, V_{DS}=0V	-	-	±100	nA
$R_{DS(ON)}$[c]	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=5.5A	-	0.38	0.43	Ω
Diode Characteristics						
V_{SD}[c]	Diode Forward Voltage	I_{SD}=11A, V_{GS}=0V	-	0.9	1.3	V
t_{rr}[d]	Reverse Recovery Time	I_{SD}=5.5A, dI_{SD}/dt=100A/μs	-	212	-	ns
Q_{rr}[d]	Reverse Recovery Charge		-	2.3	-	μC
Dynamic Characteristics[d]						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz	-	15	-	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=350V, Frequency=1.0MHz	-	830	1080	pF
C_{oss}	Output Capacitance		-	24	-	
C_{rss}	Reverse Transfer Capacitance		-	7	-	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=30V, R_L=30Ω, I_{DS}=1A, V_{GEN}=10V, R_G=6Ω	-	16	29	ns
t_r	Turn-on Rise Time		-	15	28	
$t_{d(OFF)}$	Turn-off Delay Time		-	41	74	
t_f	Turn-off Fall Time		-	70	126	
Gate Charge Characteristics[d]						
Q_g	Total Gate Charge	V_{DS}=350V, V_{GS}=10V, I_{DS}=5.5A	-	18	26	nC
Q_{gs}	Gate-Source Charge		-	4.3	-	
Q_{gd}	Gate-Drain Charge		-	7.1	-	

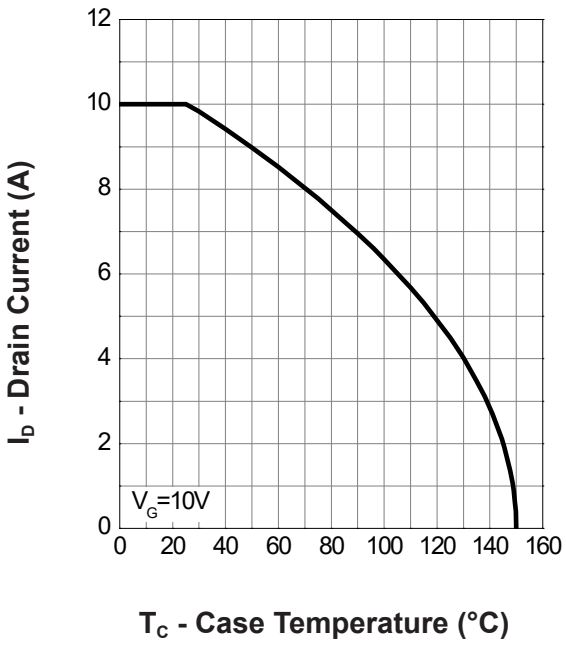
Note c : Pulse test ; pulse width≤300μs, duty cycle≤2%.
Note d : Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

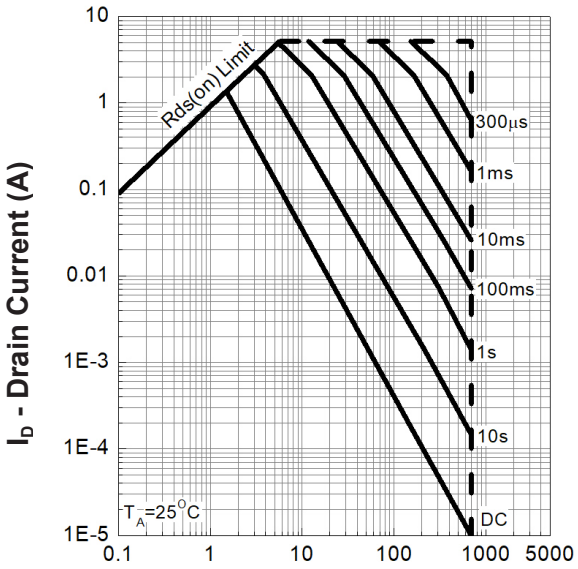
Power Dissipation



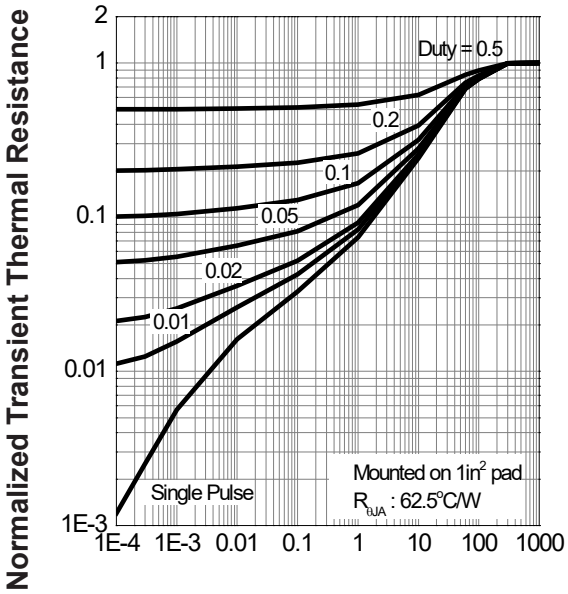
Drain Current



Safe Operation Area

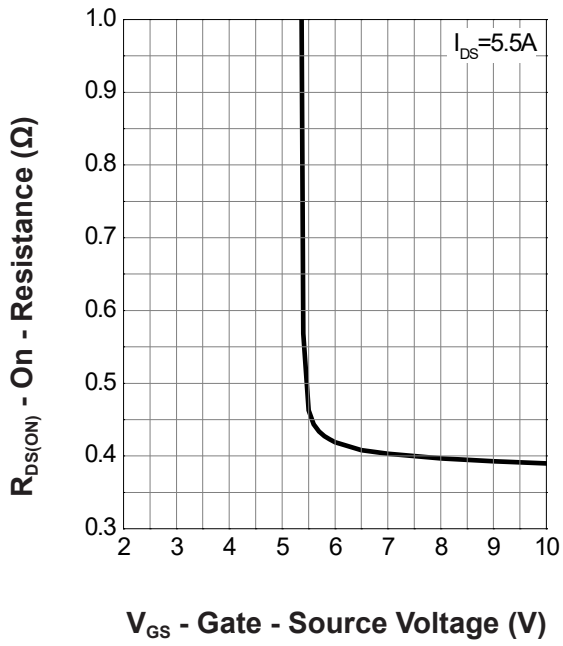


Thermal Transient Impedance

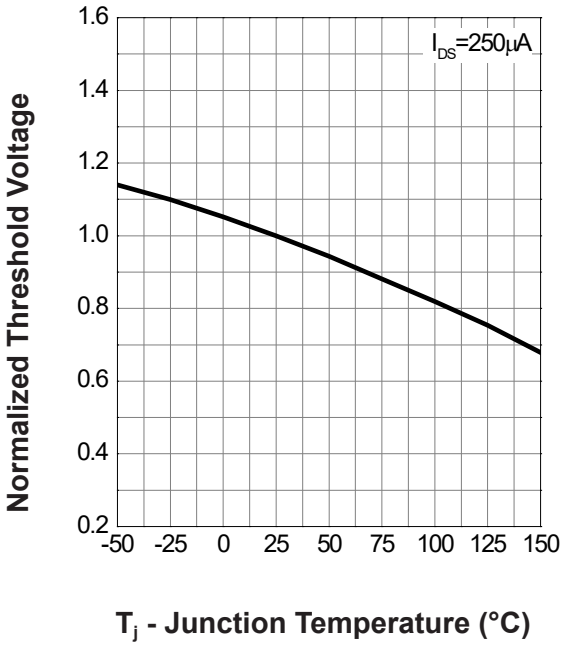


Typical Operating Characteristics(Cont.)

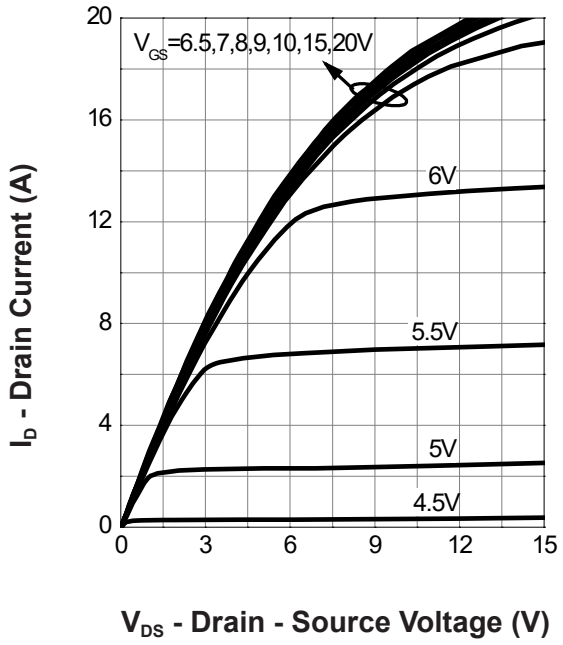
Gate-Source On Resistance



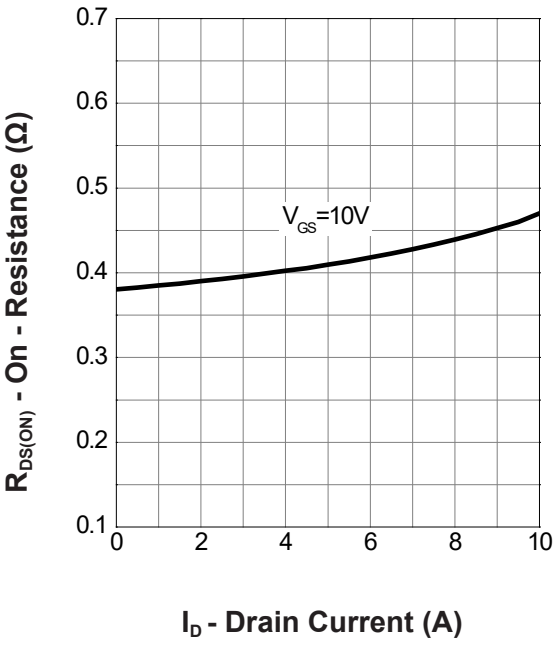
Gate Threshold Voltage



Output Characteristics

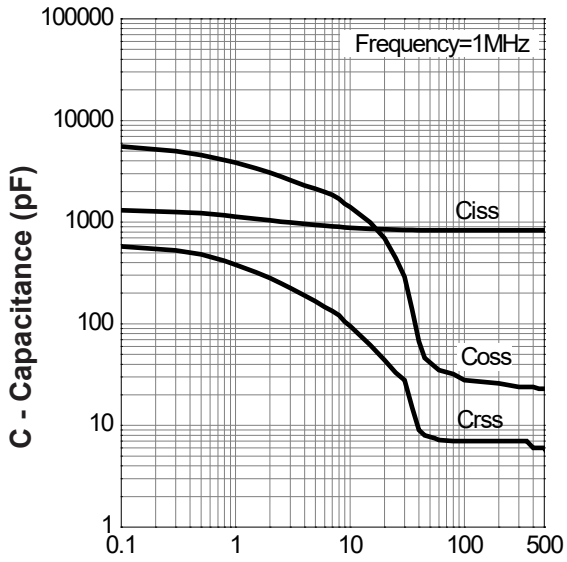


Drain-Source On Resistance

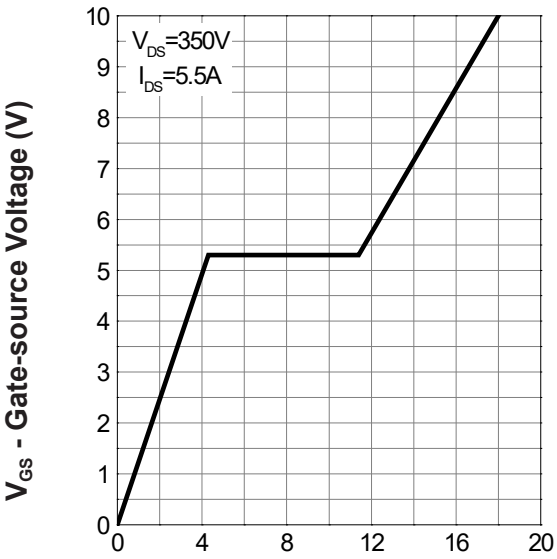


Typical Operating Characteristics(Cont.)

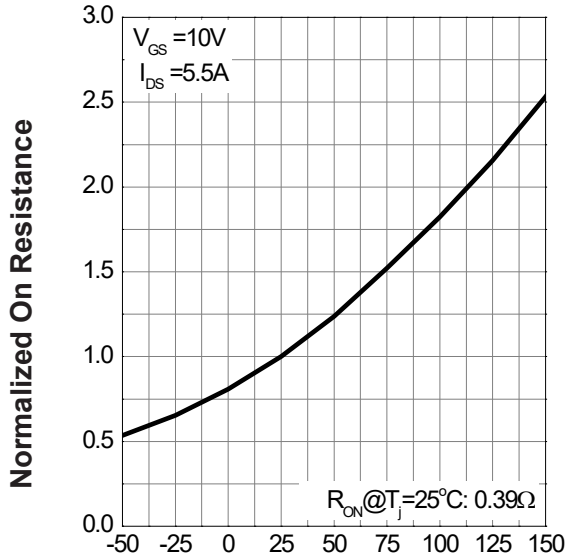
Capacitance



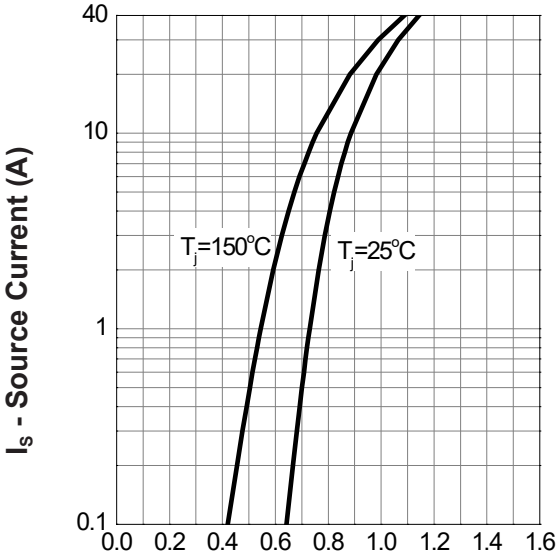
Gate Charge



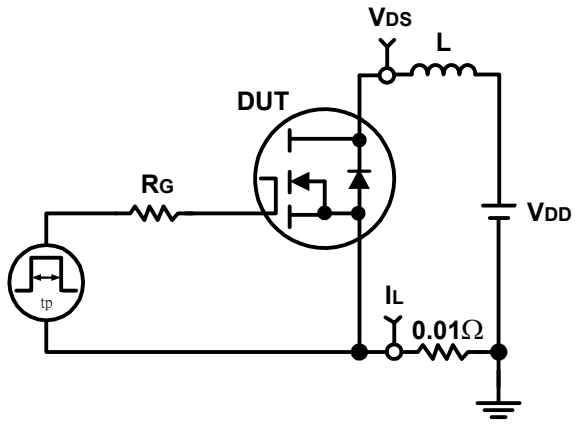
Drain-Source On Resistance

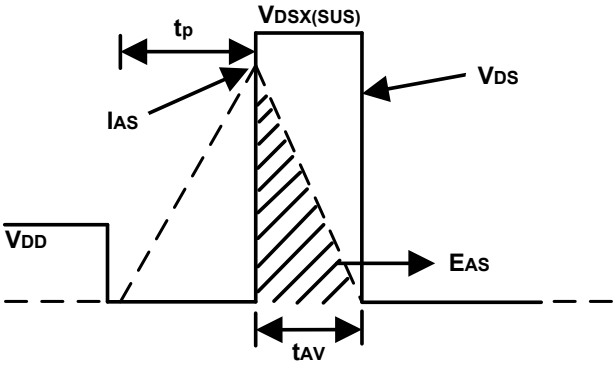


Source-Drain Diode Forward

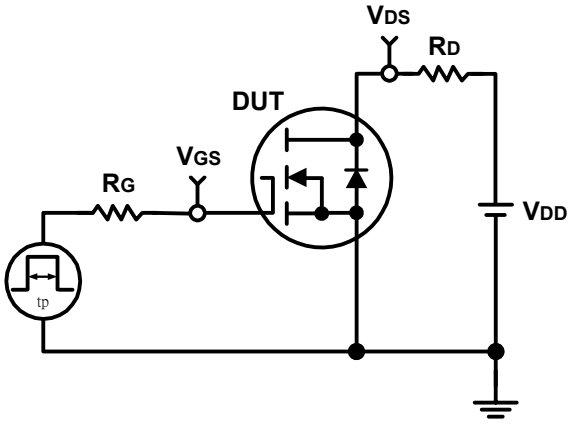


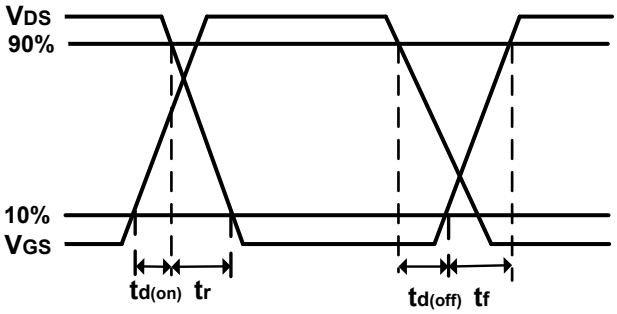
Avalanche Test Circuit and Waveforms





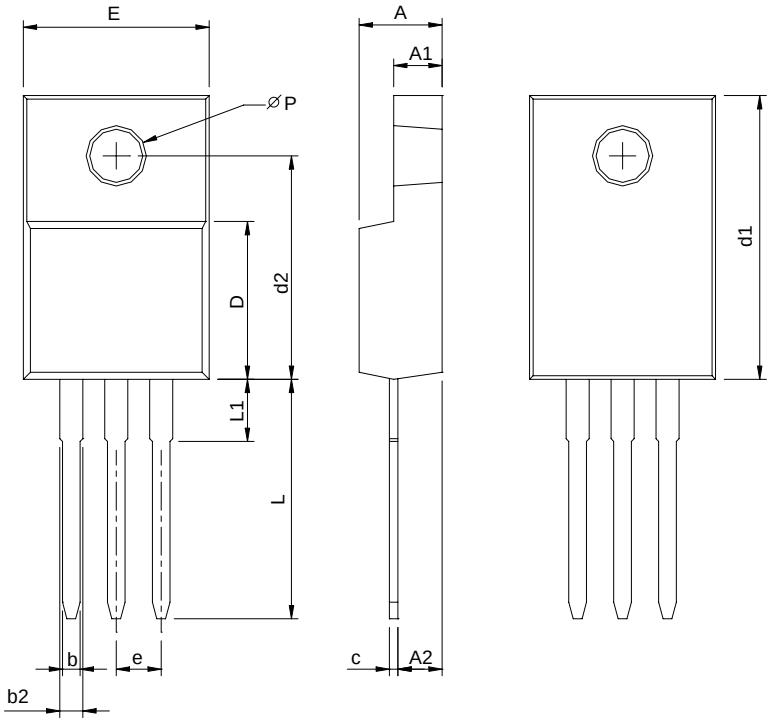
Switching Time Test Circuit and Waveforms





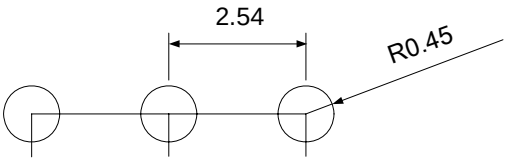
Package Information

TO-220



SYMBOL	TO-220			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	4.20	4.80	0.165	0.189
A1	2.34	3.20	0.092	0.126
A2	2.10	2.90	0.083	0.114
b	0.50	0.90	0.020	0.035
b2	0.91	1.90	0.035	0.075
c	0.30	0.80	0.012	0.031
D	8.10	9.40	0.319	0.370
d1	14.50	16.50	0.571	0.650
d2	12.10	12.90	0.476	0.508
E	9.70	10.70	0.382	0.421
e	2.54 BSC		0.100 BSC	
L	13.00	14.50	0.512	0.570
L1	1.60	4.00	0.063	0.157
P	3.00	3.60	0.118	0.142

RECOMMENDED LAND PATTERN



UNIT: mm