

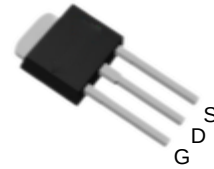
Features

- 700V/7A
 $R_{DS(ON)}=0.96\Omega(\text{typ.})@V_{GS}=10V$
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available
(RoHS Compliant)

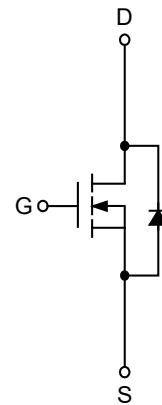
Applications

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

Pin Configuration



Top View of TO-251



N-Channel MOSFET

Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ 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	7	A
I _D	Continuous Drain Current	T _C =25°C	7	A
		T _C =100°C	5.25	
I _{DM} ^a	Pulsed Drain Current	T _C =25°C	21	
P _D	Maximum Power Dissipation	T _C =25°C	31	W
		T _C =100°C	13	
R _{θJC}	Thermal Resistance-Junction to Case		4	°C/W
R _{θJA}	Thermal Resistance-Junction to Ambient		62.5	°C/W
I _{AS} ^b	Avalanche Current, Repetitive	L=10mH	9.4	A
E _{AS} ^b	Avalanche Energy, Single pulse	L=10mH	440	mJ

Note a : Pulse width limited by maximum junction temperature.

Note b : UIS tested and pulse width limited by maximum junction temperature (initial temperature $T_J=25^{\circ}\text{C}$).

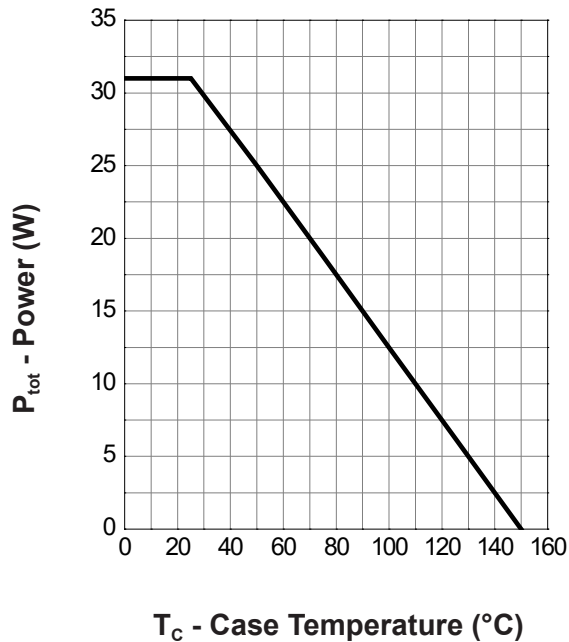
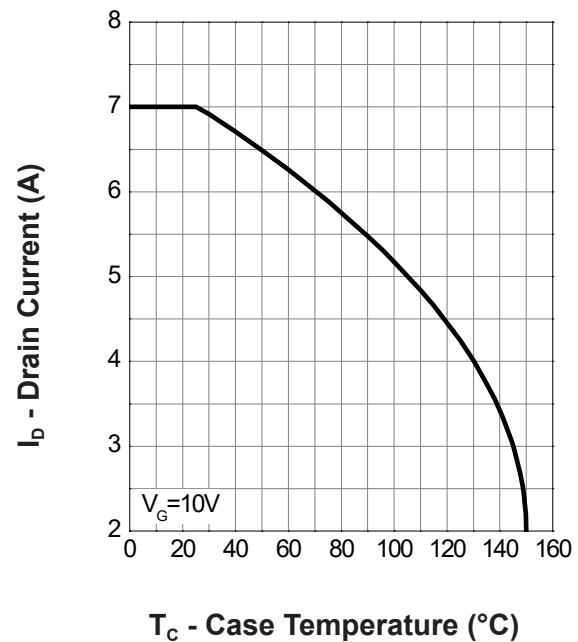
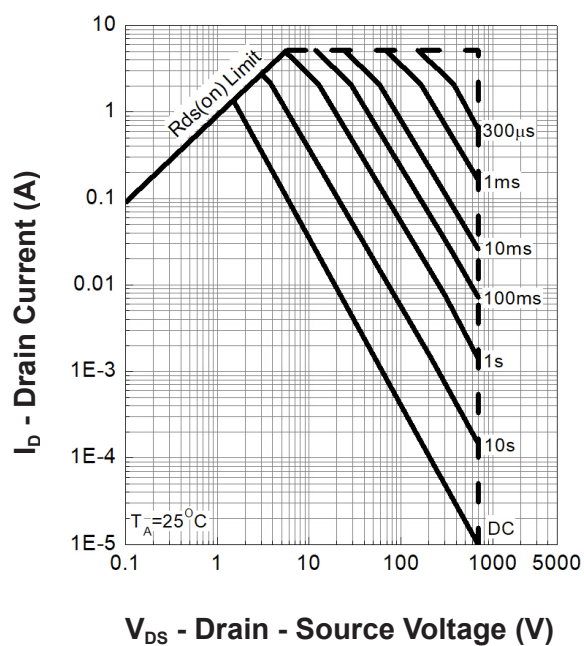
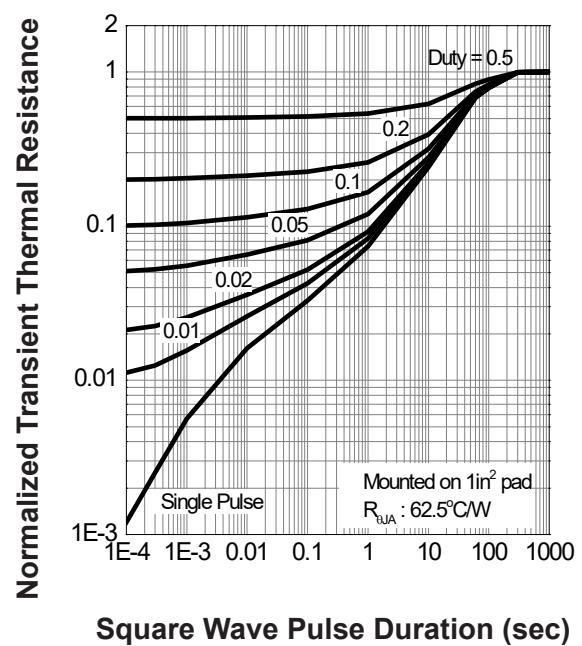
Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

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	-	0.96	1.14	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} =25V, Frequency=1.0MHz	-	1530	1980	pF
C _{oss}	Output Capacitance		-	114	-	
C _{rss}	Reverse Transfer Capacitance		-	5	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =350V, R _L =30Ω, I _{DS} =7A, V _{GEN} =10V, R _G =10Ω	-	24	39	ns
t _r	Turn-on Rise Time		-	15	28	
t _{d(OFF)}	Turn-off Delay Time		-	47	74	
t _f	Turn-off Fall Time		-	19	56	
Gate Charge Characteristics ^d						
Q _g	Total Gate Charge	V _{DS} =350V, V _{GS} =10V, I _{DS} =5.5A	-	28	36	nC
Q _{gs}	Gate-Source Charge		-	6.3	-	
Q _{gd}	Gate-Drain Charge		-	9.1	-	

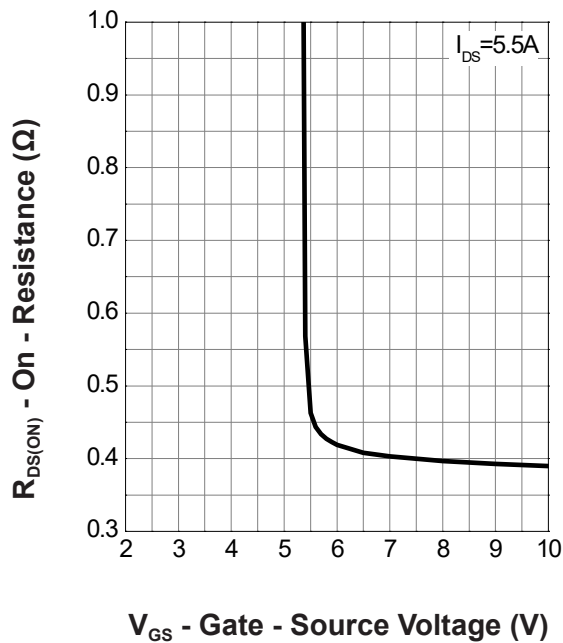
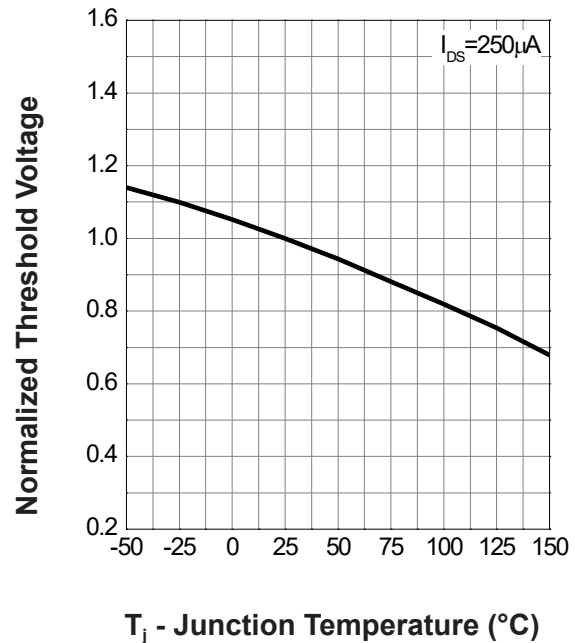
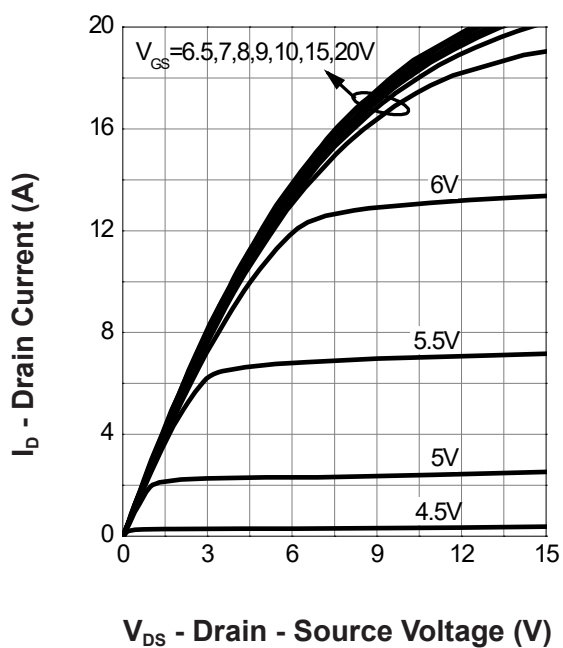
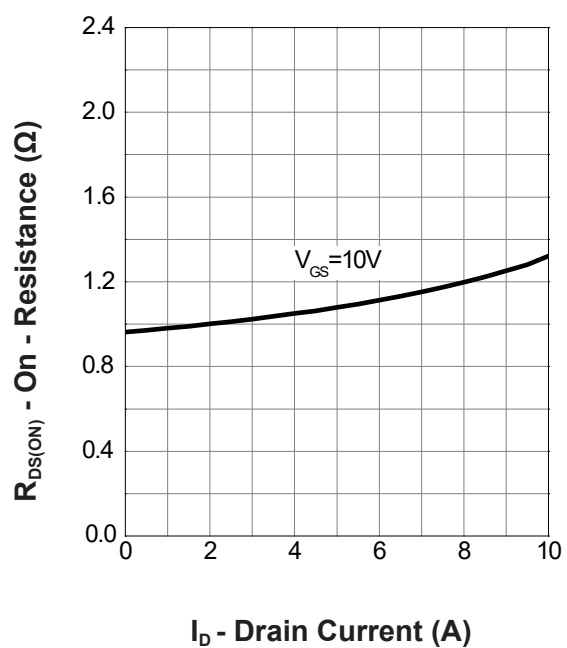
Note c : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

Note d : Guaranteed by design, not subject to production testing.

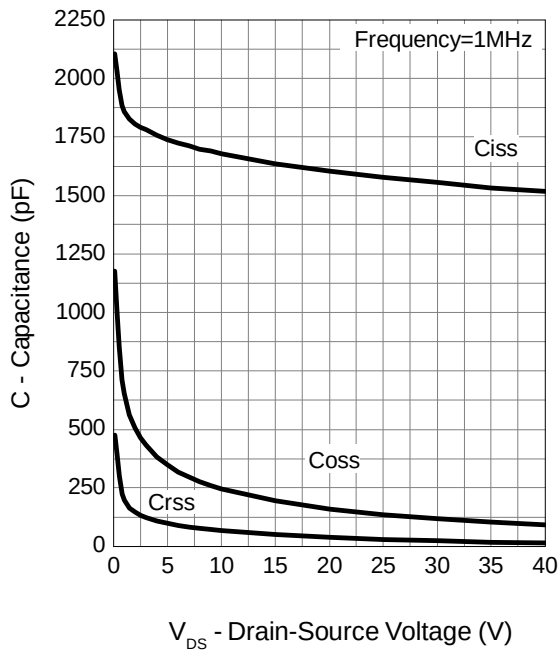
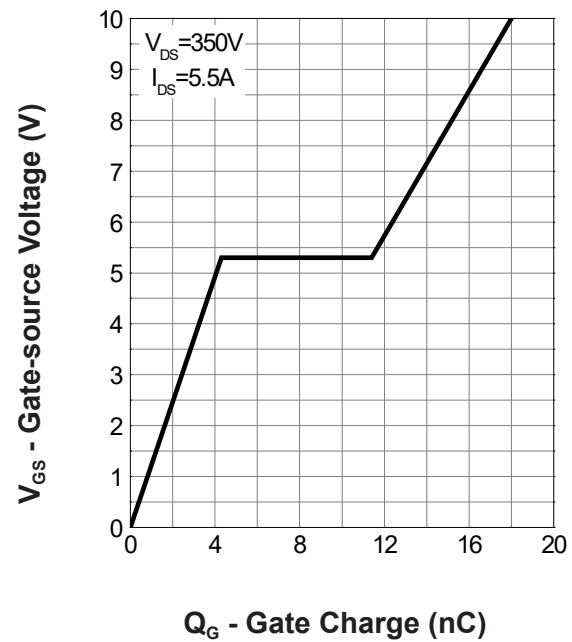
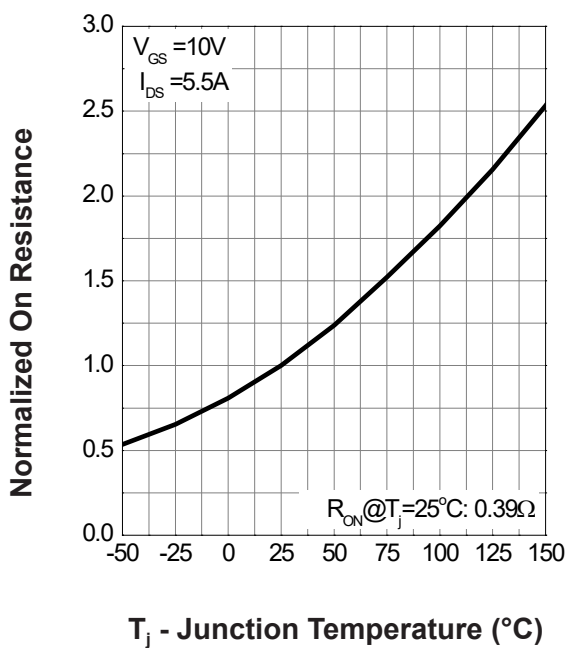
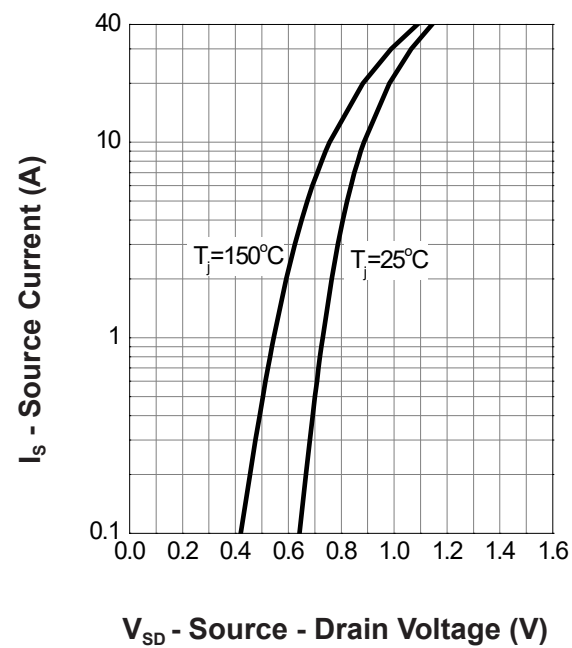
Typical Operating Characteristics

Power Dissipation

Drain Current

Safe Operation Area

Thermal Transient Impedance


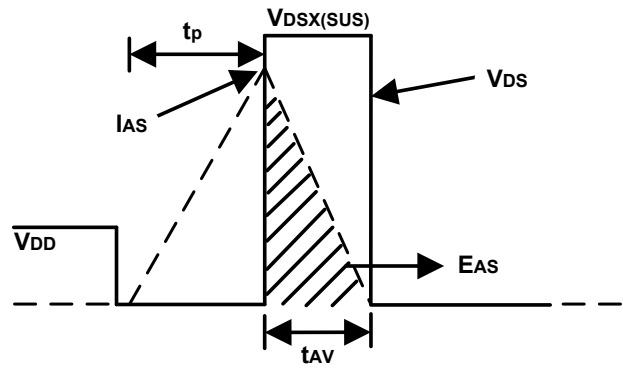
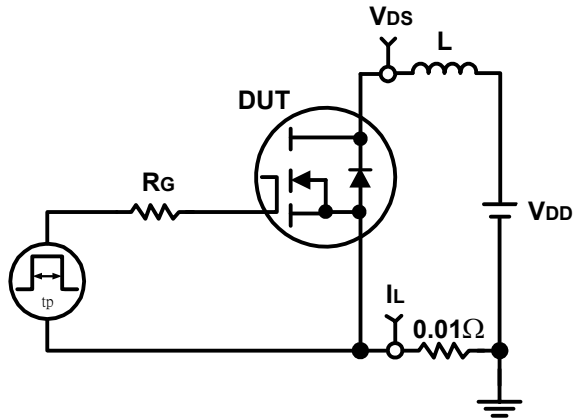
Typical Operating Characteristics(Cont.)

Gate-Source On Resistance

Gate Threshold Voltage

Output Characteristics

Drain-Source On Resistance


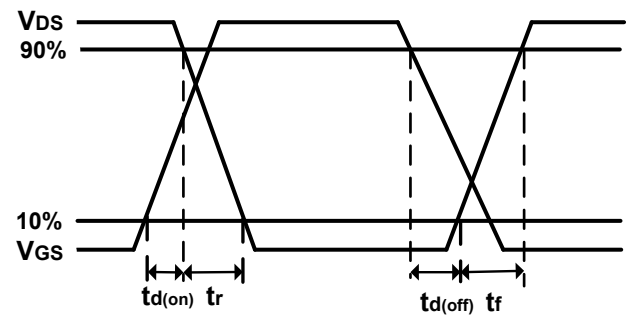
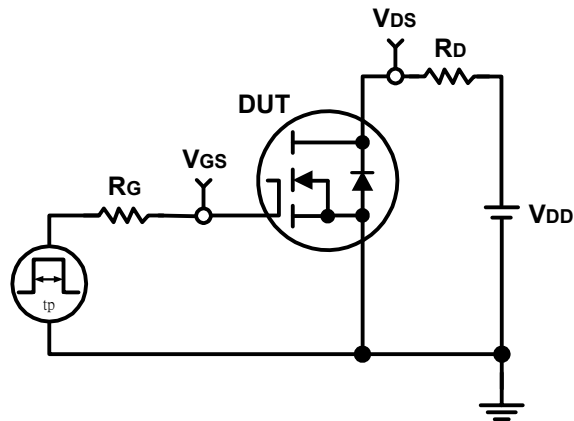
Typical Operating Characteristics(Cont.)

Capacitance

Gate Charge

Drain-Source On Resistance

Source-Drain Diode Forward


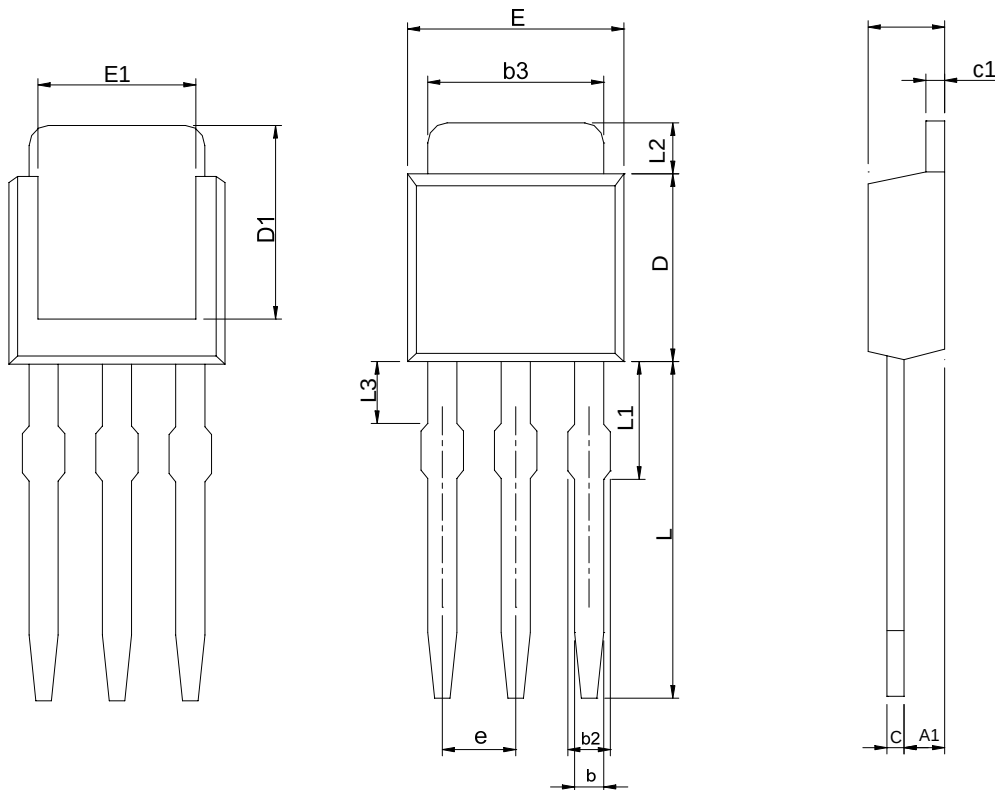
Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms

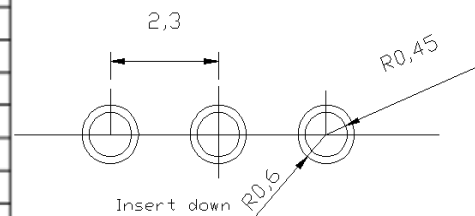


Package Information



SYMBOL	TO-251			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.184	2.388	0.086	0.094
A1	0.890	1.143	0.035	0.045
b	0.635	0.890	0.025	0.035
b2	0.910	1.143	0.036	0.045
b3	4.953	5.460	0.195	0.215
c	0.457	0.610	0.018	0.024
c1	0.457	0.890	0.018	0.035
D	5.334	6.223	0.210	0.245
D1	5.207	-	0.205	-
E	6.350	6.730	0.250	0.265
E1	4.320	-	0.170	-
e	2.29 BSC		0.090 BSC	
L	7.000	9.650	0.280	0.380
L1	1.905	2.290	0.075	0.090
L2	0.890	1.270	0.035	0.050
L3	1.143	1.520	0.045	0.060

RECOMMENDED LAND PATTERN



UNIT: mm