

Features

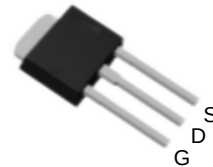
- -60V/-10A,
 $R_{DS(ON)} = 78m\Omega(\text{typ.}) @ V_{GS} = -10V$
 $R_{DS(ON)} = 110m\Omega(\text{typ.}) @ V_{GS} = -4.5V$
- Reliable and Rugged
- Lead Free and Green Devices Available
(RoHS Compliant)
- 100% UIS + R_g Tested

Note : The diode connected between the gate and source serves only as protection against ESD. No gate overvoltage rating is implied.

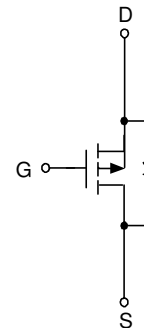
Applications

- Power Management in Notebook Computer, Portable Equipment and Battery Powered Systems.

Pin Description



Top View of TO-251



P-Channel MOSFET

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter		Rating	Unit
Common Ratings (T _A = 25°C Unless Otherwise Noted)				
V _{DSS}	Drain-Source Voltage		-60	V
V _{GSS}	Gate-Source Voltage		±20	
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	
		T _C =100°C	-7.5	
I _{DM}	Pulsed Drain Current	T _C =25°C	-30	
P _D	Maximum Power Dissipation	T _C =25°C	44.6	W
		T _C =100°C	17.9	
R _{θJC}	Thermal Resistance-Junction to Case	Steady State	2.8	°C/W
R _{θJA}	Thermal Resistance-Junction to Ambient	t ≤ 10s	20	°C/W
		Steady State	55	
I _{AS} ^a	Avalanche Current, Single pulse (L=0.1mH)		19	A
E _{AS} ^a	Avalanche Energy, Single pulse (L=0.1mH)		18	mJ

Note * : Current limited by bond wire.

Note a : UIS tested and pulse width are limited by maximum junction temperature 150°C (initial temperature $T_J = 25^\circ\text{C}$).

Electrical Characteristics (T_A = 25°C Unless Otherwise Noted)

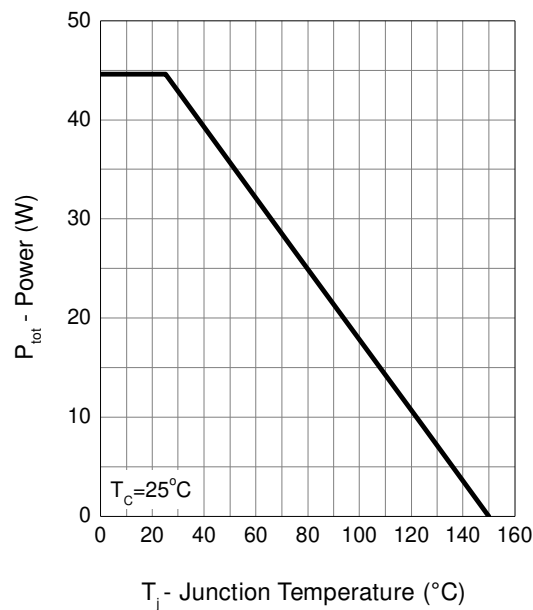
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =-250μA	-60	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-48V, V _{GS} =0V T _J =85°C	-	-	-1 -30	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =-250μA	-1	-1.8	-3	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^b	Drain-Source On-state Resistance	V _{GS} =-10V, I _{DS} =-5.8A V _{GS} =-4.5V, I _{DS} =-3.5A	-	78 110	93 140	mΩ
Diode Characteristics						
V _{SD} ^b	Diode Forward Voltage	I _{SD} =-1A, V _{GS} =0V	-	-0.7	-1	V
t _{rr} ^c	Reverse Recovery Time	I _{SD} =-5.8A, dl _{SD} /dt=100A/μs	-	22	-	ns
Q _{rr} ^c	Reverse Recovery Charge		-	23	-	nC
Dynamic Characteristics ^c						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	10	20	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-30V, Frequency=1.0MHz	-	950	-	pF
C _{oss}	Output Capacitance		-	76	-	
C _{rss}	Reverse Transfer Capacitance		-	56	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =-30V, R _L =30Ω, I _{DS} =-1A, V _{GEN} =-10V, R _G =6Ω	-	9	-	ns
t _r	Turn-on Rise Time		-	6	-	
t _{d(OFF)}	Turn-off Delay Time		-	36	-	
t _f	Turn-off Fall Time		-	25	-	
Gate Charge Characteristics ^c						
Q _g	Total Gate Charge	V _{DS} =-30V, V _{GS} =-10V, I _{DS} =-5.8A	-	12	-	nC
Q _{gs}	Gate-Source Charge		-	1.5	-	
Q _{gd}	Gate-Drain Charge		-	3.3	-	

Note b : Pulse test ; pulse width≤300μs, duty cycle≤2%.

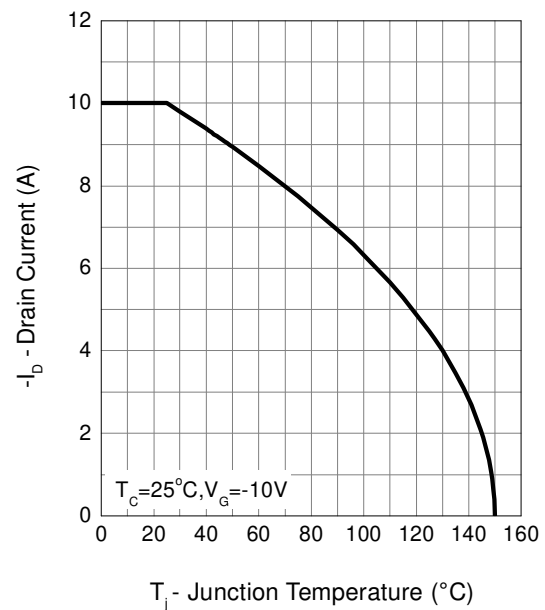
Note c : Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

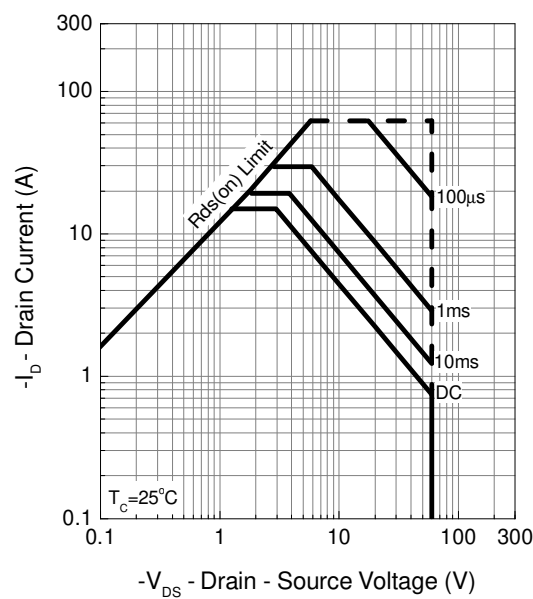
Power Dissipation



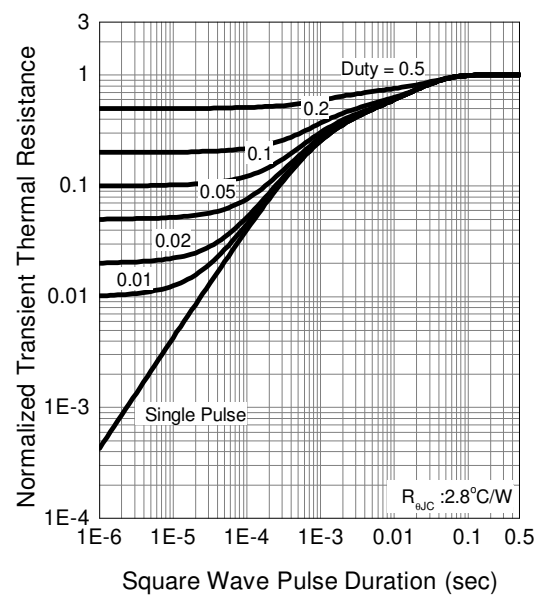
Drain Current



Safe Operation Area

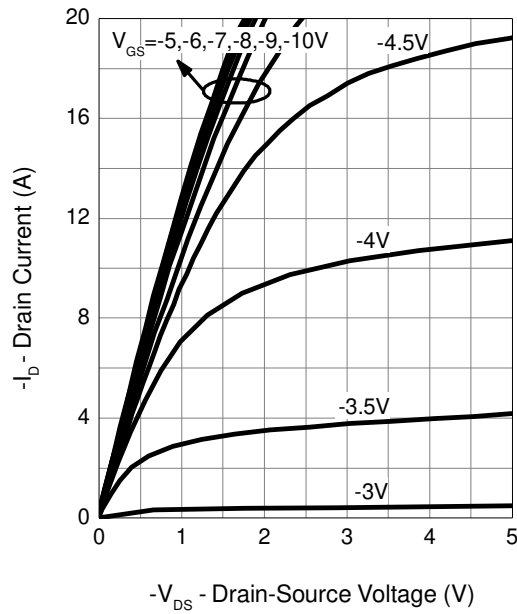


Thermal Transient Impedance

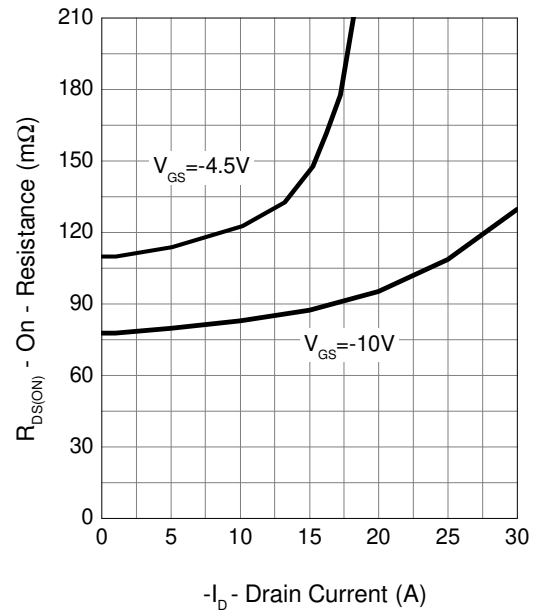


Typical Operating Characteristics (Cont.)

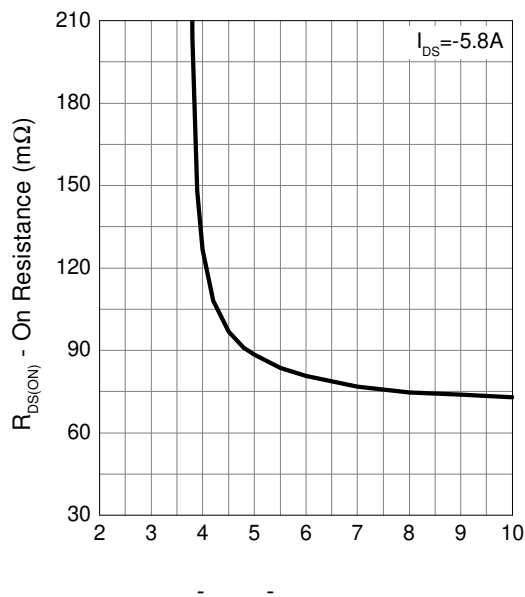
Output Characteristics



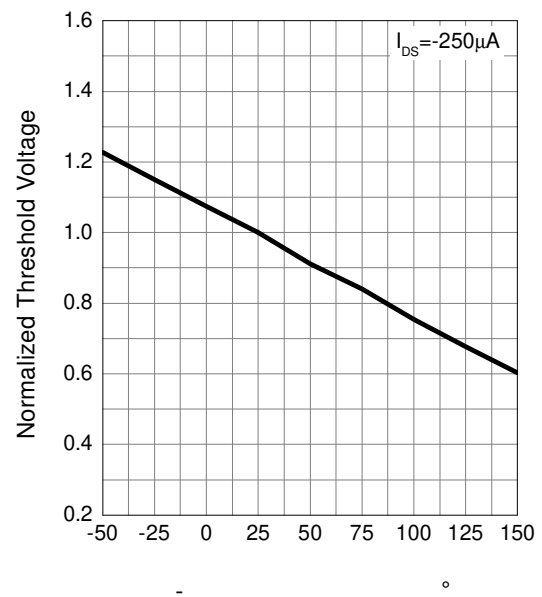
Drain-Source On Resistance



Gate-Source On Resistance

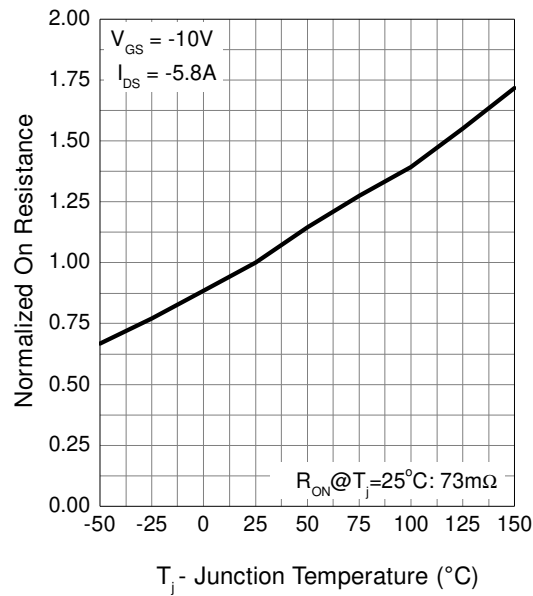


Gate Threshold Voltage

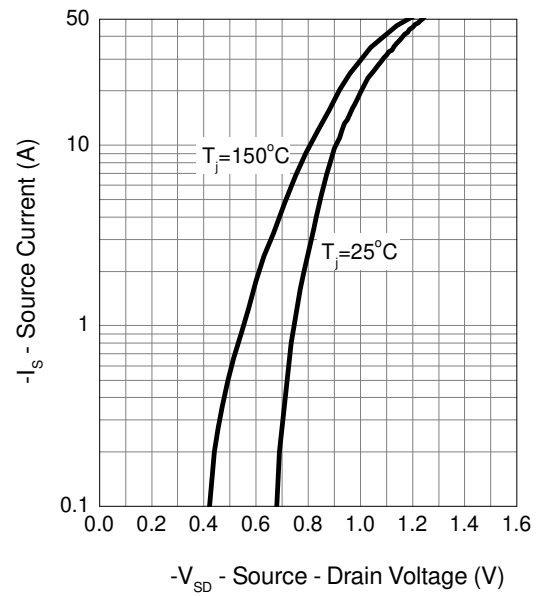


Typical Operating Characteristics (Cont.)

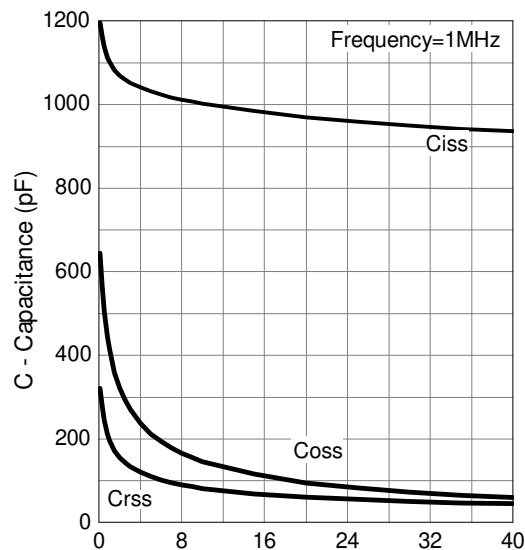
Drain-Source On Resistance



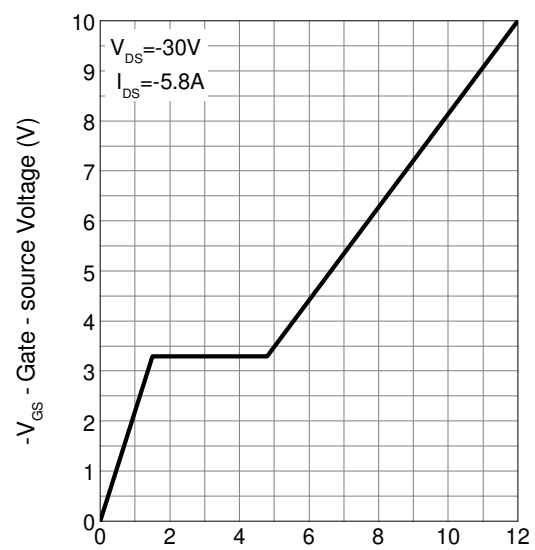
Source-Drain Diode Forward



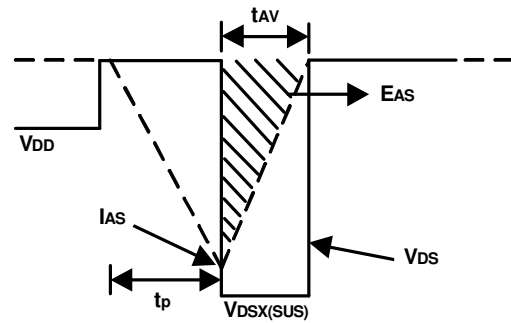
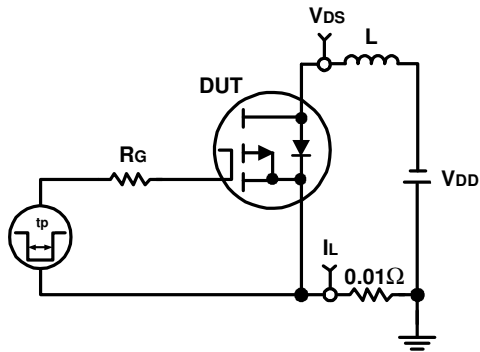
Capacitance



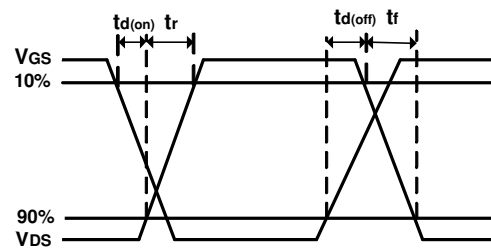
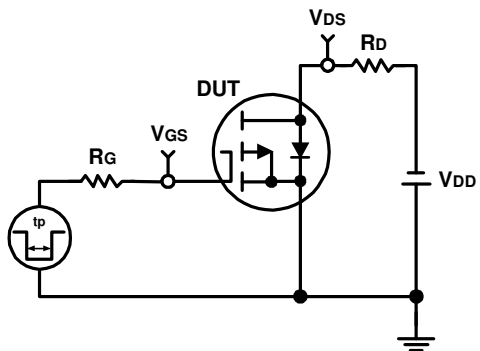
Gate Charge



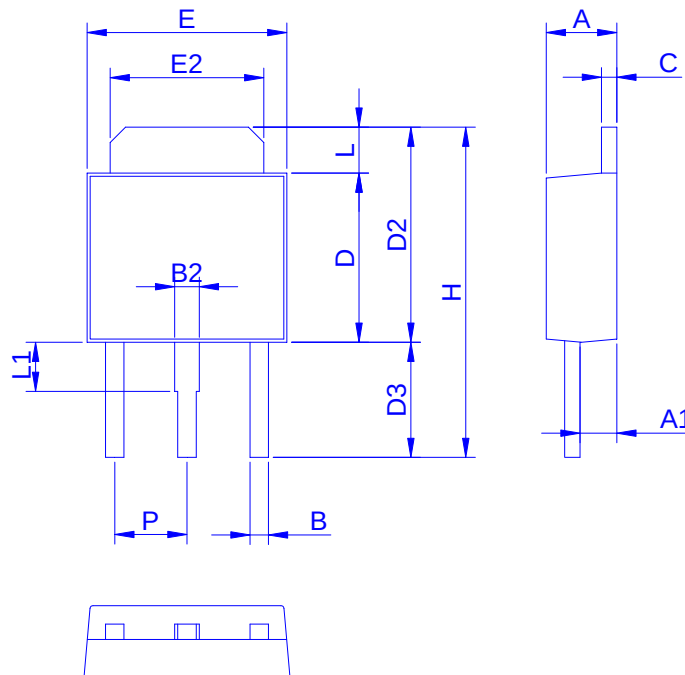
Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms



Package Information



Dimension in mm

Dimension	A	A1	B	B2	C	D	D2	D3	E	E2	H	L	L1	P
Min.	2.10	0.90	0.40	0.60	0.40	5.30	6.70	3.40	6.30	4.80	10.2	0.89	0.90	2.10
Max.	2.50	1.50	0.90	1.15	0.60	6.25	7.30	4.30	6.80	5.50	11.5	1.40	1.80	2.50