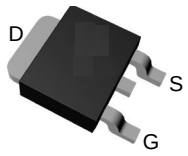
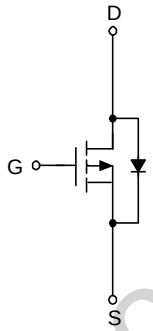
Features

- -40V/-60A,
  $R_{DS(ON)}$= 11mΩ (max.) @ V_{GS}=-10V
  $R_{DS(ON)}$= 14mΩ (max.) @ V_{GS}=-4.5V
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

Pin Description



Top View of TO-252-2



P-Channel MOSFET

Applications

- Power Management in LCD TV Inverter.

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

Symbol	Parameter		Rating	Unit
V_{DSS}	Drain-Source Voltage		-40	V
V_{GSS}	Gate-Source Voltage		±20	
I_D [a]	Continuous Drain Current (V_{GS}=-10V)	T_A=25°C	-15	A
		T_A=70°C	-12	
I_{DP} [a]	300μs Pulsed Drain Current Tested	T_A=25°C	-62	
I_D [c]	Continuous Drain Current (V_{GS}=-10V)	T_C=25°C	-44	
		T_C=100°C	-28	
I_{DP} [c]	300μs Pulsed Drain Current Tested	T_C=25°C	-176	
I_S [c]	Diode Continuous Forward Current		-40	
I_{AS} [b]	Avalanche Current, Single pulse	L=0.1mH	-30	
		L=1mH	-13	
E_{AS} [b]	Avalanche Energy, Single pulse	L=0.1mH	45	mJ
		L=1mH	84	
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	
P_D [a]	Maximum Power Dissipation	T_A=25°C	6.3	W
		T_A=70°C	4.0	
P_D [c]	Maximum Power Dissipation	T_C=25°C	50	
		T_C=100°C	20	
$R_{\theta JA}$ [a]	Thermal Resistance-Junction to Ambient	t ≤ 10s	20	°C/W
		Steady State	50	
$R_{\theta JC}$ [c]	Thermal Resistance-Junction to Case	Steady State	2.5	

Note a：Surface Mounted on 1in^2 pad area, t ≤ 10sec. $R_{\theta JA}$ steady state t = 100s.
Note b：UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature T_j=25°C).
Note c：The power dissipation P_D is based on $T_{J(MAX)}$ = 150°C, and it is useful for reducing junction-to-case thermal resistance ($R_{\theta JC}$) when additional heat sink is used.

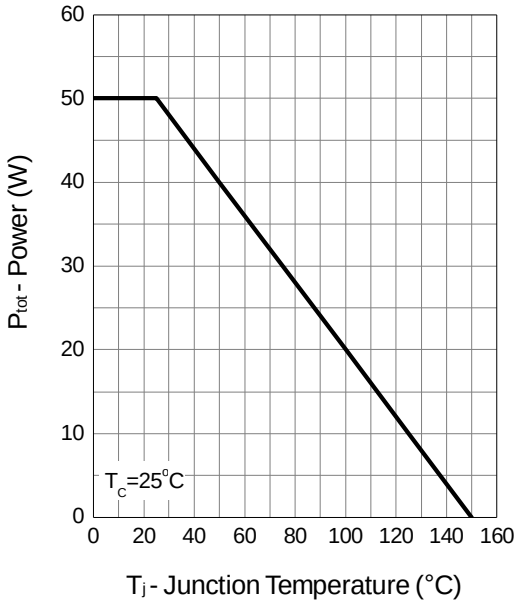
Electrical Characteristics (T_A = 25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=-250μA	-40	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-32V, V_{GS}=0V	-	-	-1	μA
		T_J=85°C	-	-	-30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=-250μA	-1.4	-1.9	-2.4	V
I_{GSS}	Gate Leakage Current	V_{GS}=±25V, V_{DS}=0V	-	-	±100	nA
$R_{DS(ON)}$ [d]	Drain-Source On-state Resistance	V_{GS}=-10V, I_{DS}=-15A	-	11	15	mΩ
		V_{GS}=-4.5V, I_{DS}=-10A	-	14	22	
Diode Characteristics						
V_{SD} [d]	Diode Forward Voltage	I_{SD}=-1A, V_{GS}=0V	-	-0.75	-1	V
t_{rr}	Reverse Recovery Time	I_{SD}=-15A, dI_{SD}/dt=100A/μs	-	24	-	ns
Q_{rr}	Reverse Recovery Charge		-	18	-	nC
Dynamic Characteristics [e]						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz	-	2.3	5	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=-20V, Frequency=1.0MHz	-	1500	1950	pF
C_{oss}	Output Capacitance		-	235	-	
C_{rss}	Reverse Transfer Capacitance		-	180	-	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=-20V, R_L=20Ω, I_{DS}=-1A, V_{GEN}=-10V, R_G=6Ω	-	14	25	ns
t_r	Turn-on Rise Time		-	12	22	
$t_{d(OFF)}$	Turn-off Delay Time		-	41	74	
t_f	Turn-off Fall Time		-	22	40	
Gate Charge Characteristics [e]						
Q_g	Total Gate Charge	V_{DS}=-20V, V_{GS}=-10V, I_{DS}=-15A	-	32	45	nC
Q_{gs}	Gate-Source Charge		-	5.2	-	
Q_{gd}	Gate-Drain Charge		-	8	-	

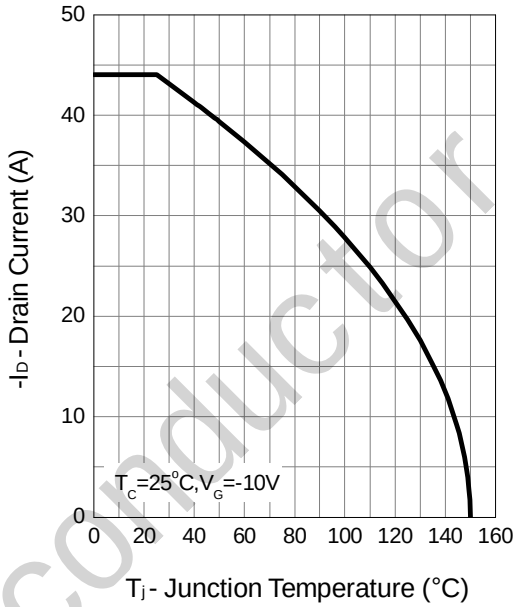
Note d：Pulse test ; pulse width≤300μs, duty cycle≤2%.
Note e：Guaranteed by design, not subject to production testing.

Typical Characteristics

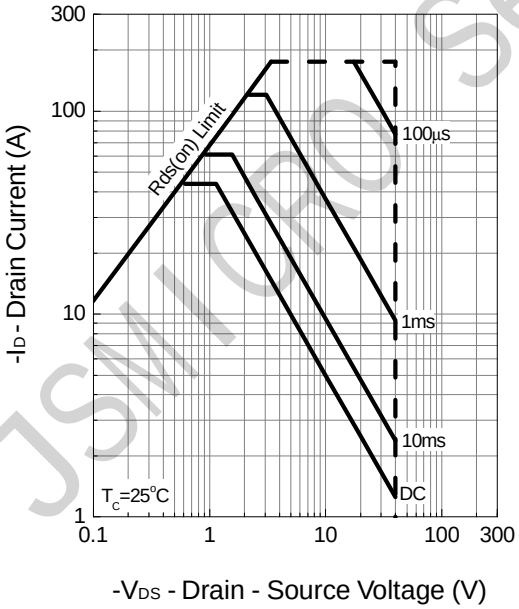
Power Dissipation



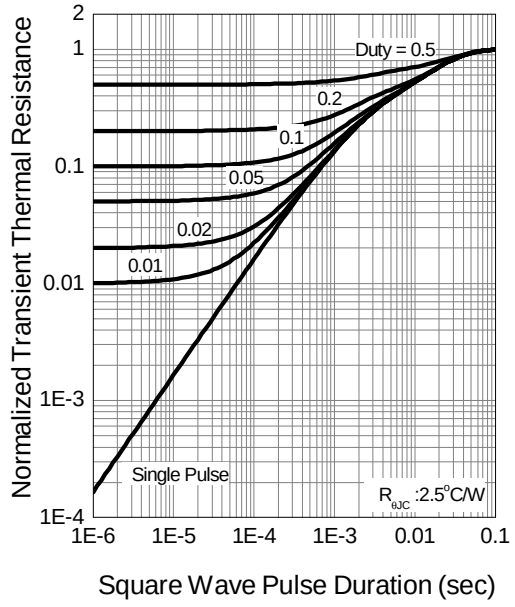
Drain Current



Safe Operation Area

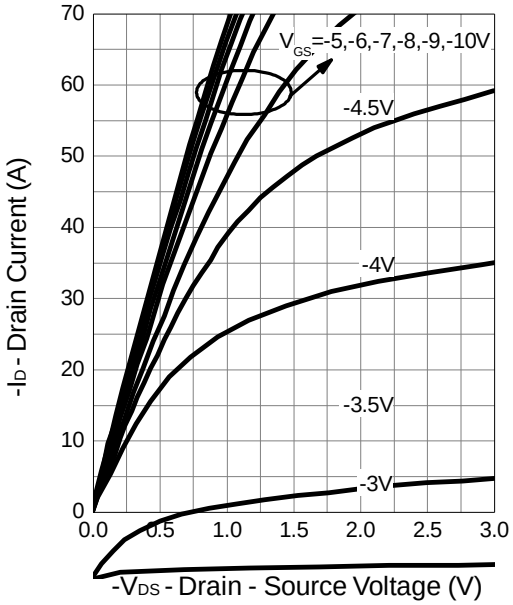


Thermal Transient Impedance

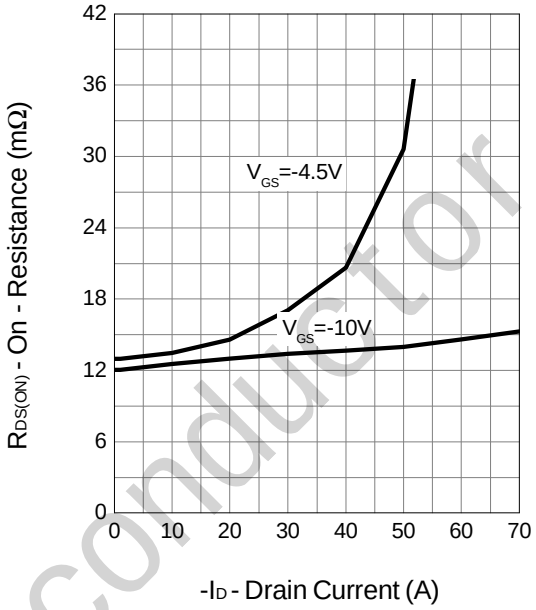


Typical Characteristics (Cont.)

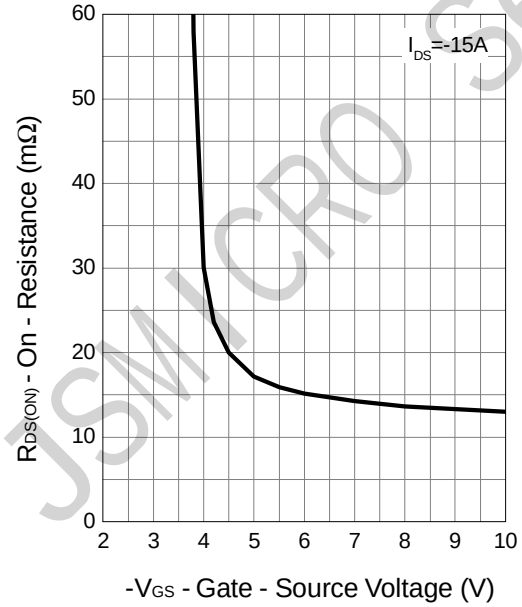
Output Characteristics



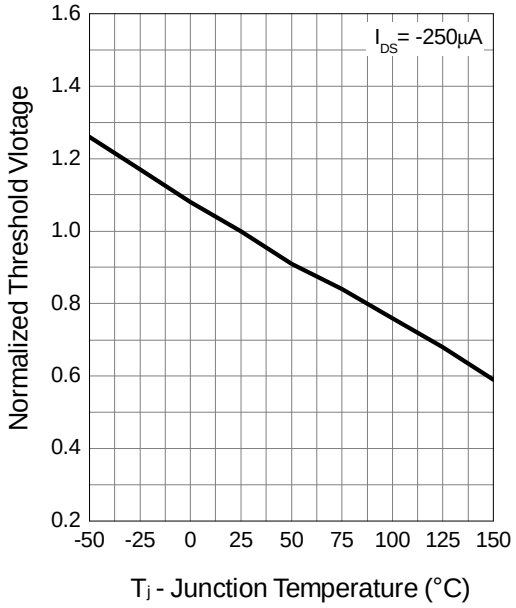
Drain-Source On Resistance



Gate-Source On Resistance

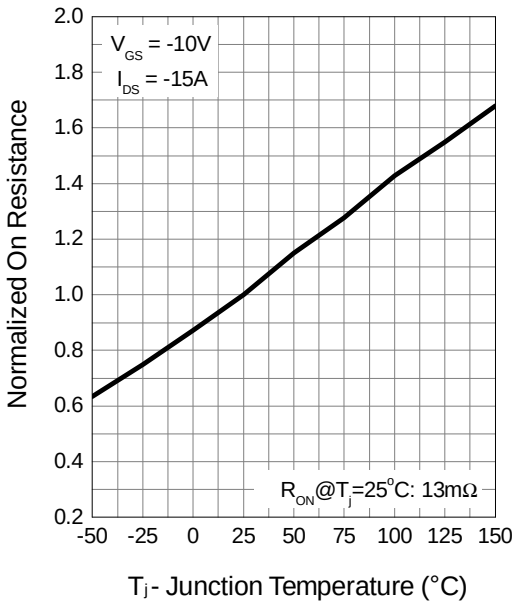


Gate Threshold Voltage

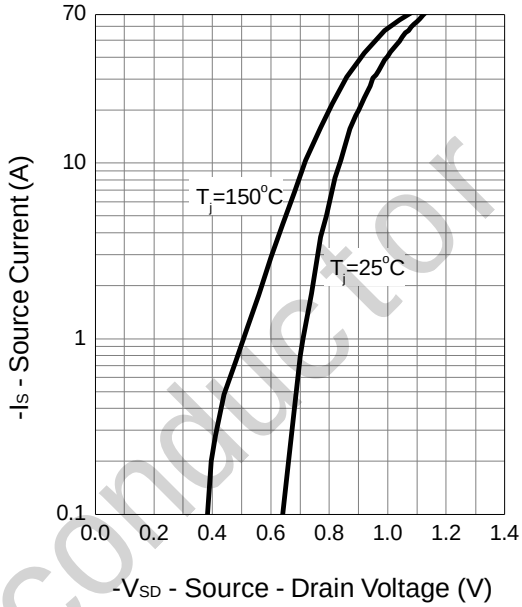


Typical Characteristics (Cont.)

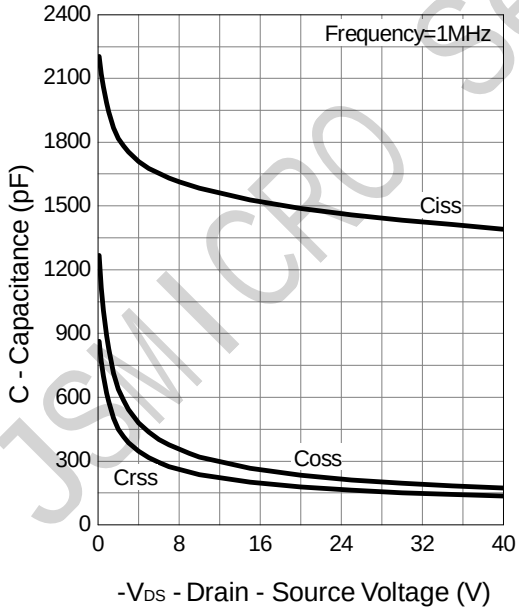
Drain-Source On Resistance



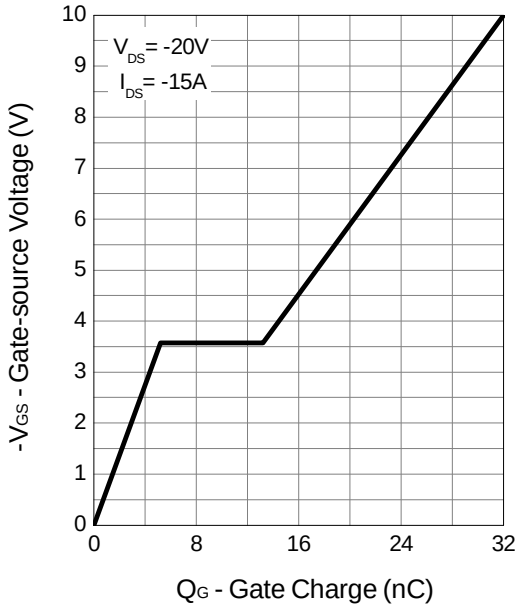
Source-Drain Diode Forward



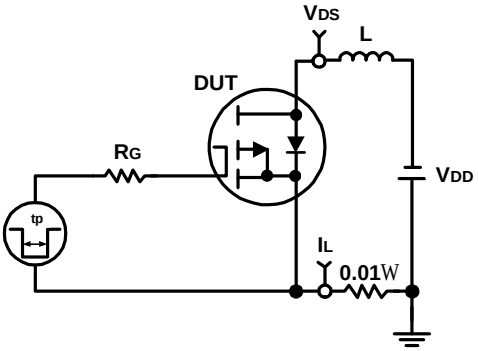
Capacitance

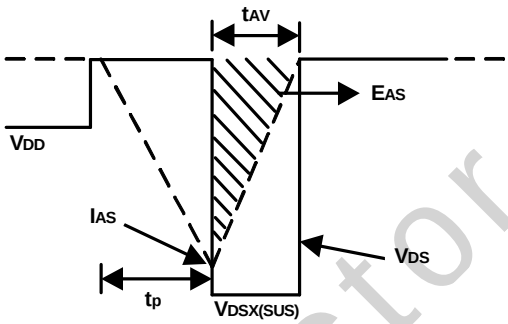


Gate Charge

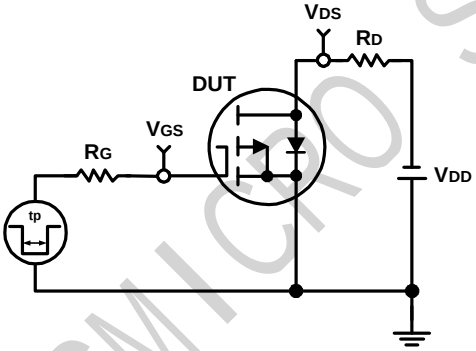


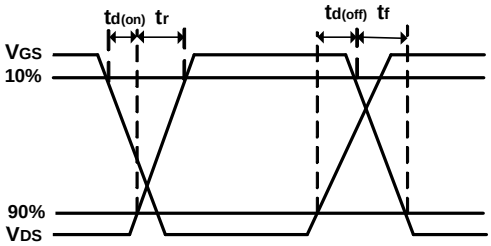
Avalanche Test Circuit and Waveforms



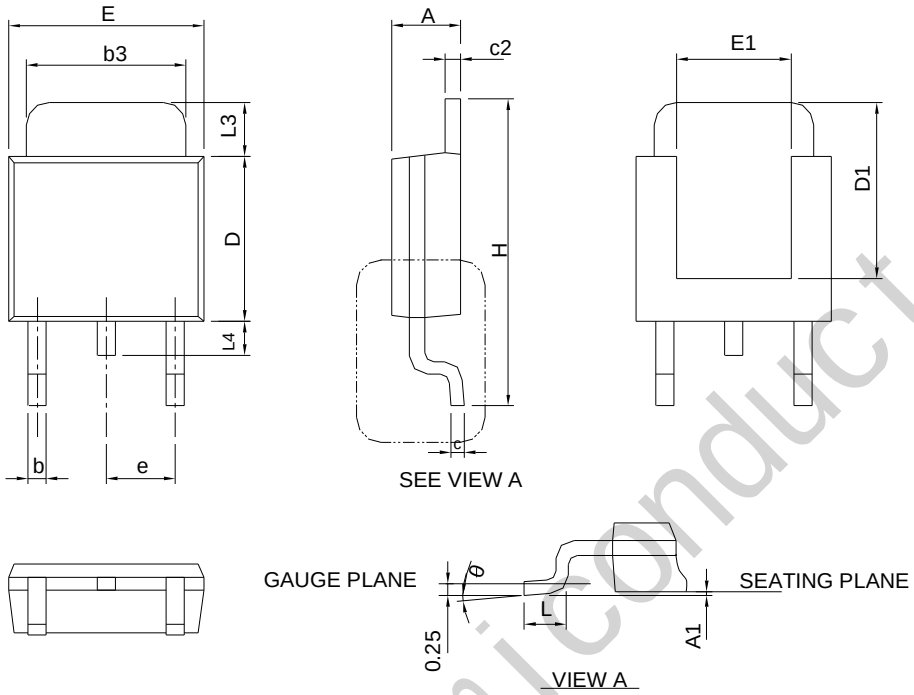


Switching Time Test Circuit and Waveforms





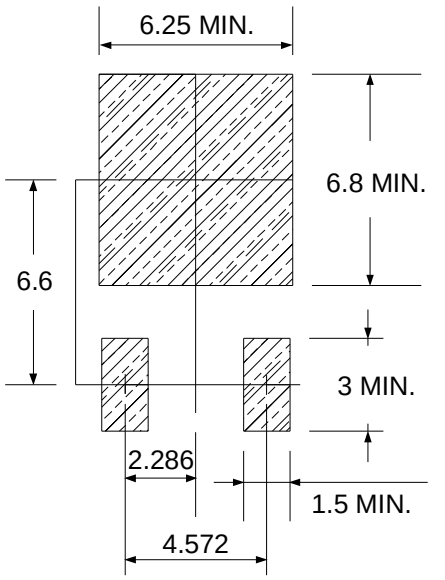
Package Information



SYMBOL	TO-252-2			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.18	2.39	0.086	0.094
A1	-	0.13	-	0.005
b	0.50	0.89	0.020	0.035
b3	4.95	5.46	0.195	0.215
c	0.46	0.61	0.018	0.024
c2	0.46	0.89	0.018	0.035
D	5.33	6.22	0.210	0.245
D1	4.57	6.00	0.180	0.236
E	6.35	6.73	0.250	0.265
E1	3.81	6.00	0.150	0.236
e	2.29 BSC		0.090 BSC	
H	9.40	10.41	0.370	0.410
L	0.90	1.78	0.035	0.070
L3	0.89	2.03	0.035	0.080
L4	-	1.02	-	0.040
θ	0°	8°	0°	8°

Note : Follow JEDEC TO-252 .

RECOMMENDED LAND PATTERN



UNIT: mm