

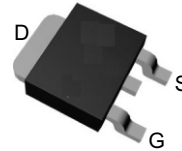
Features

- 40V/50A,
 $R_{DS(ON)} = 11.5m\Omega$ (Max.) @ $V_{GS} = 10V$
 $R_{DS(ON)} = 14.5m\Omega$ (Max.) @ $V_{GS} = 4.5V$
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

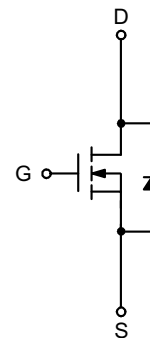
Applications

- Power Management in Desktop Computer or DC/DC Converters.

Pin Description



Top View of TO-252-3



N-Channel MOSFET

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

Symbol	Parameter	Rating	Unit	
Common Ratings				
V _{DSS}	Drain-Source Voltage	40	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	20	A
I _D	Continuous Drain Current	T _C =25°C	50	
		T _C =100°C	31	
I _{DM} ^a	Pulsed Drain Current	T _C =25°C	90	
P _D	Maximum Power Dissipation	T _C =25°C	41.7	W
		T _C =100°C	16.7	
R _{qJC}	Thermal Resistance-Junction to Case	Steady State	3	°C/W
I _D	Continuous Drain Current	T _A =25°C	12.7	A
		T _A =70°C	10.2	
P _D	Maximum Power Dissipation	T _A =25°C	2.8	W
		T _A =70°C	1.8	
R _{qJA}	Thermal Resistance-Junction to Ambient	t ? 10s	20	°C/W
		Steady State	45	
I _{AS} ^b	Avalanche Current, Single pulse	L=0.1mH	23	A
E _{AS} ^b	Avalanche Energy, Single pulse	L=0.1mH	26	mJ

Note a : Max. current is limited by bonding wire.

Note b : UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature T_J=25°C).

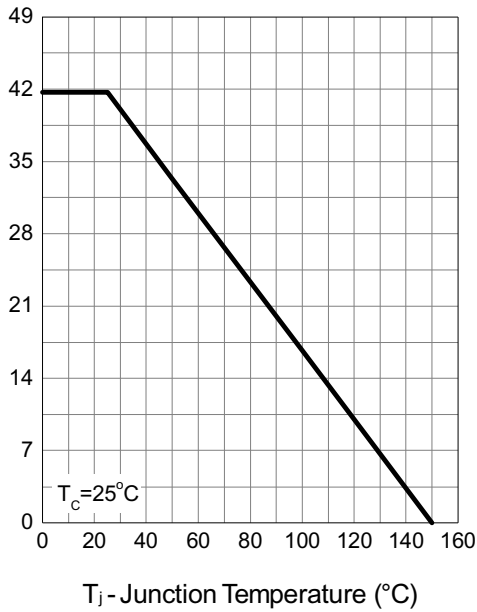
Electrical Characteristics (T_A = 25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250mA	40	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =32V, V _{GS} =0V T _J =85°C	-	-	1 30	mA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250mA	1.5	1.8	2.5	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^c	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =30A T _J =125°C	-	9.5 14.2	11.5 -	mΩ
		V _{GS} =4.5V, I _{DS} =15A	-	11	14.5	
Gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =15A	-	30	-	S
Diode Characteristics						
V _{SD} ^c	Diode Forward Voltage	I _{SD} =10A, V _{GS} =0V	-	0.9	1.1	V
t _{rr}	Reverse Recovery Time	I _{SD} =10A, di _{SD} /dt=100A/ms	-	13.8	-	ns
t _a	Charge Time		-	9.8	-	
t _b	Discharge Time		-	4	-	
Q _{rr}	Reverse Recovery Charge		-	8	-	nC
Dynamic Characteristics ^d						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	0.7	1.1	1.8	W
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =20V, Frequency=1.0MHz	-	1120	-	pF
C _{oss}	Output Capacitance		-	132	-	
C _{rss}	Reverse Transfer Capacitance		-	75	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =20V, R _L =20W, I _{DS} =1A, V _{GEN} =10V, R _G =1W	-	12.8	-	ns
t _r	Turn-on Rise Time		-	10.4	-	
t _{d(OFF)}	Turn-off Delay Time		-	24	-	
t _f	Turn-off Fall Time		-	5.6	-	
Gate Charge Characteristics ^d						
Q _g	Total Gate Charge	V _{DS} =20V, V _{GS} =4.5V, I _{DS} =30A	-	9.4	11.2	nC
Q _g	Total Gate Charge	V _{DS} =20V, V _{GS} =10V, I _{DS} =30A	-	20	24	
Q _{gth}	Threshold Gate Charge		-	1.4	-	
Q _{gs}	Gate-Source Charge		-	3.1	-	
Q _{gd}	Gate-Drain Charge	-	5	-		

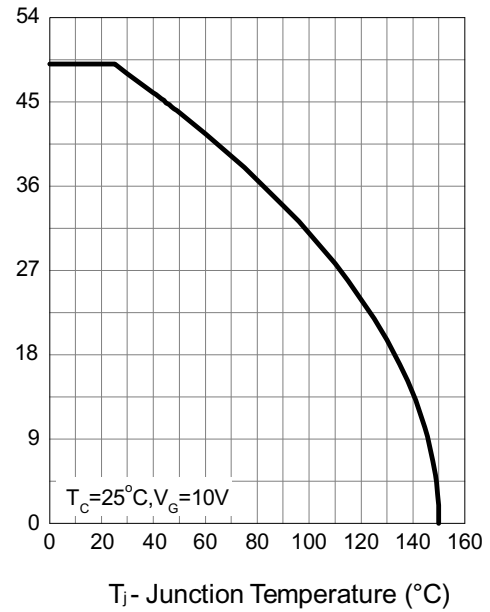
Note c : Pulse test ; pulse width 300ns, duty cycle?2%.

Typical Operating Characteristics

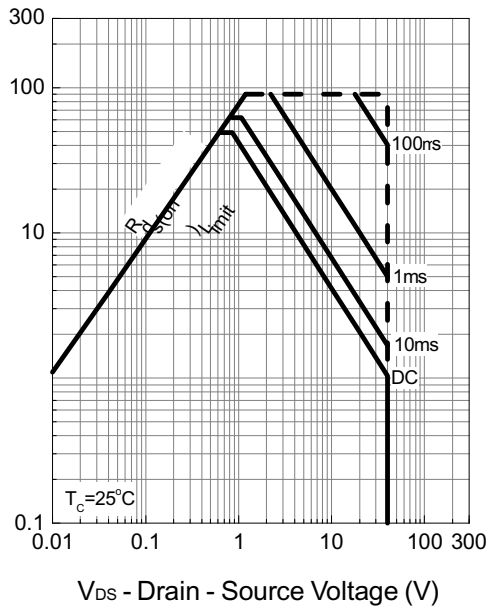
Power Dissipation



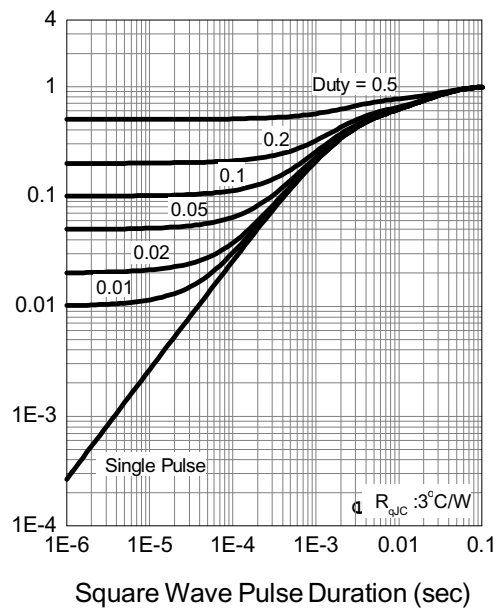
Drain Current



Safe Operation Area

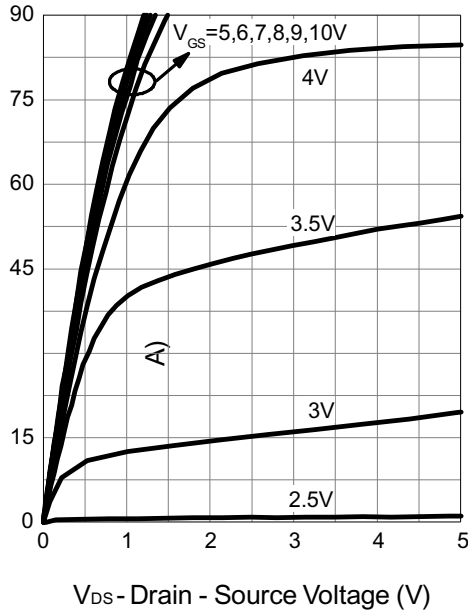


Thermal Transient Impedance

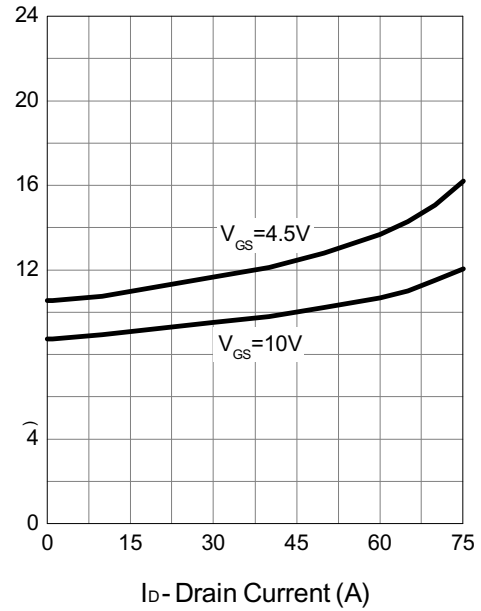


Typical Operating Characteristics (Cont.)

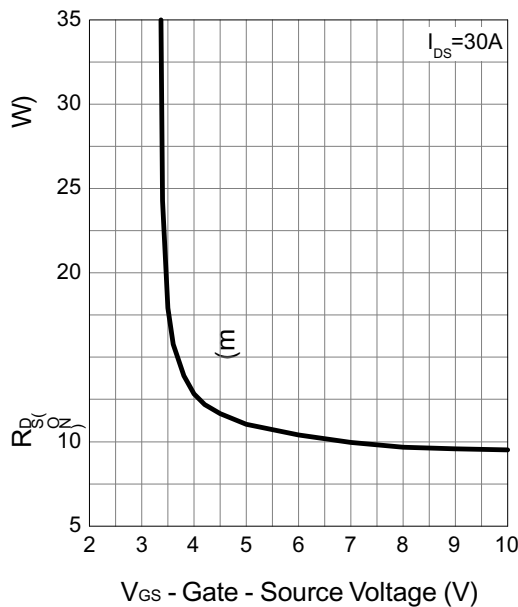
Output Characteristics



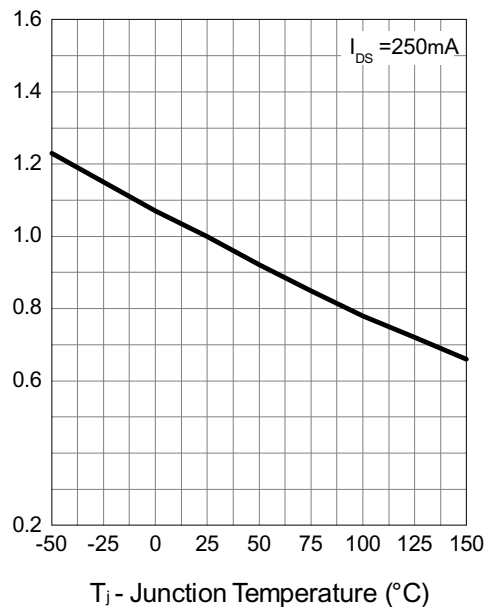
Drain-Source On Resistance



Gate-Source On Resistance

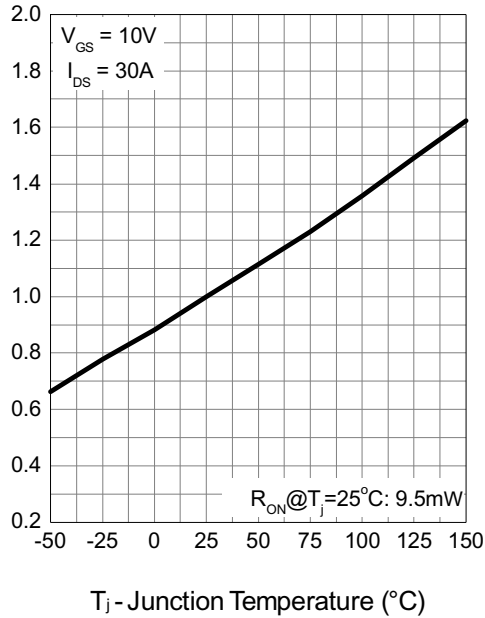


Gate Threshold Voltage

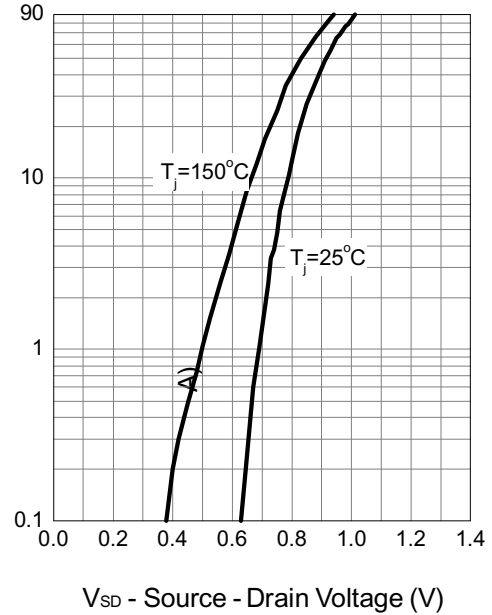


Typical Operating Characteristics (Cont.)

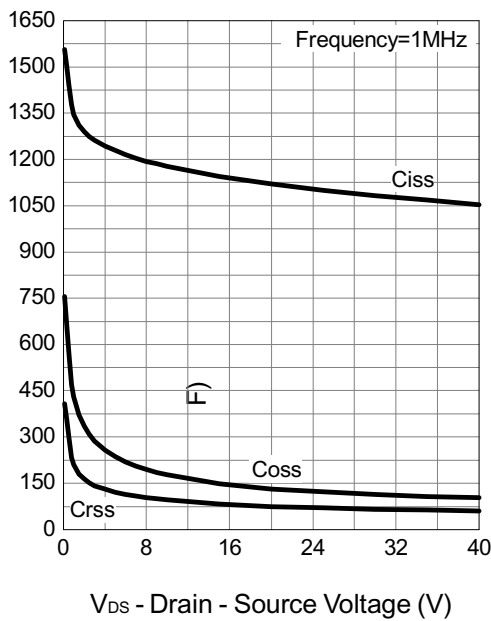
Drain-Source On Resistance



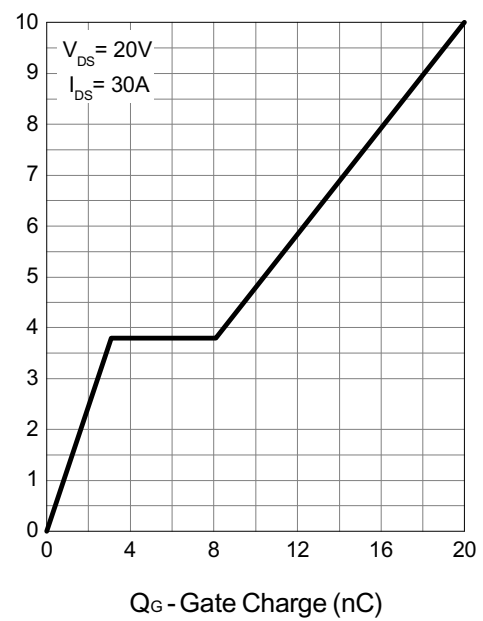
Source-Drain Diode Forward



Capacitance

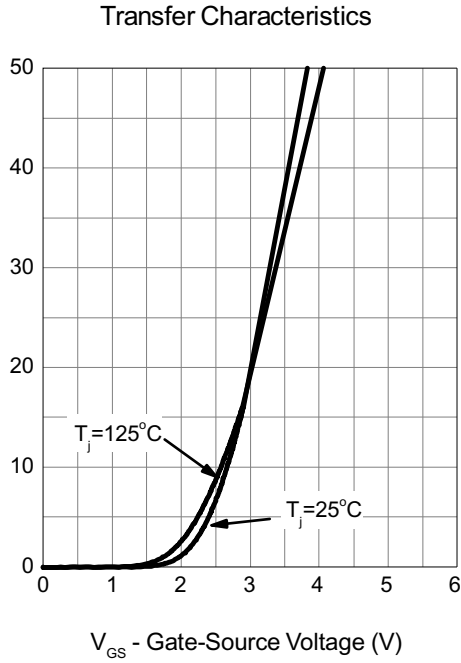


Gate Charge

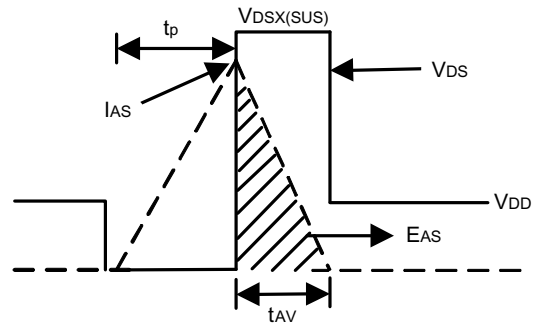
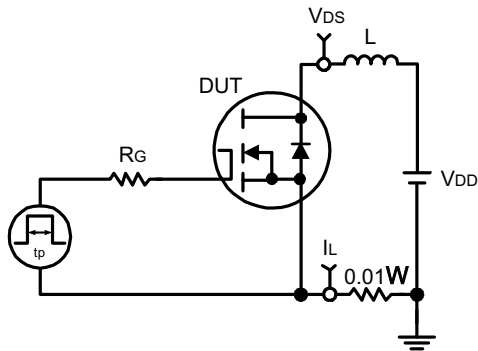




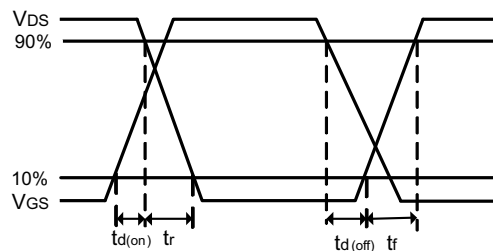
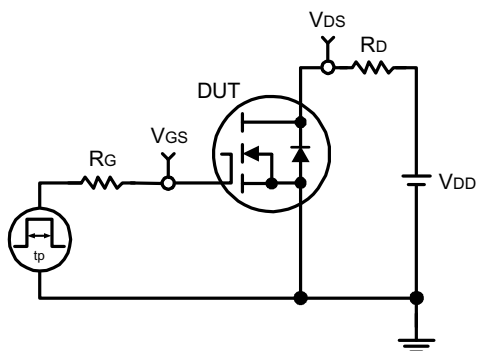
Typical Operating Characteristics (Cont.)



Avalanche Test Circuit and Waveforms



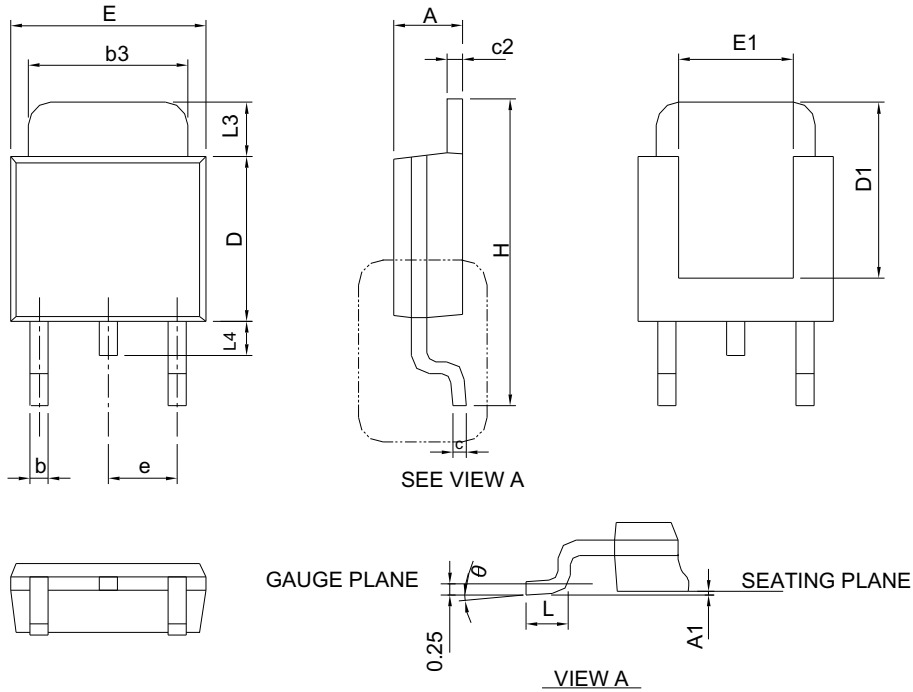
Switching Time Test Circuit and Waveforms





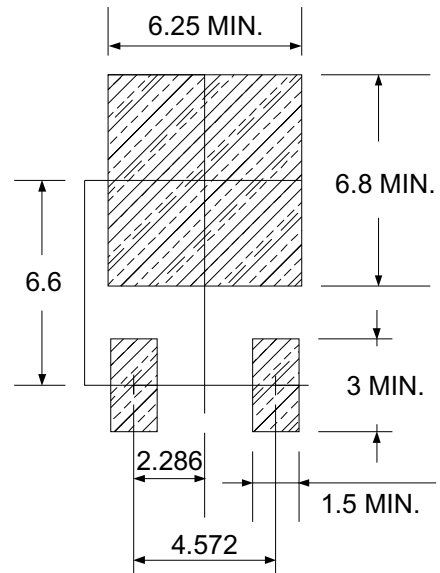
Package Information

TO-252-3



DIMENSIONS	TO-252-3			
	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°

RECOMMENDED LAND PATTERN



UNIT: mm

Note : Follow JEDEC TO-252 .