

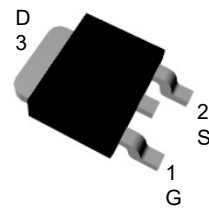
Features

- 40V/170A,
 $R_{DS(ON)} = 2.2m\Omega$ (typ.) @ $V_{GS} = 10V$
 $R_{DS(ON)} = 3m\Omega$ (typ.) @ $V_{GS} = 4.5V$
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

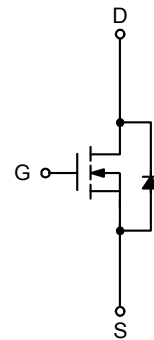
Applications

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

Pin Description



Top View of TO-252-2



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		40	V
V _{GSS}	Gate-Source Voltage		±20	
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	°C
I _S	Diode Continuous Forward Current		170	A
I _{DP}	Pulse Drain Current Tested	T _C =25°C	510	A
I _D ^a	Continuous Drain Current	T _C =25°C	170	A
		T _C =100°C	128	
P _D	Maximum Power Dissipation	T _C =25°C	50	W
		T _C =100°C	20	
R _{θJC}	Thermal Resistance-Junction to Case	Steady State	2.5	°C/W
R _{θJA}	Thermal Resistance-Junction to Ambient	t ≤ 10s	15	°C/W
		Steady State	50	
I _{AS} ^a	Avalanche Current, Single pulse	L=0.5mH	36	A
E _{AS} ^a	Avalanche Energy, Single pulse	L=0.5mH	324	mJ

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

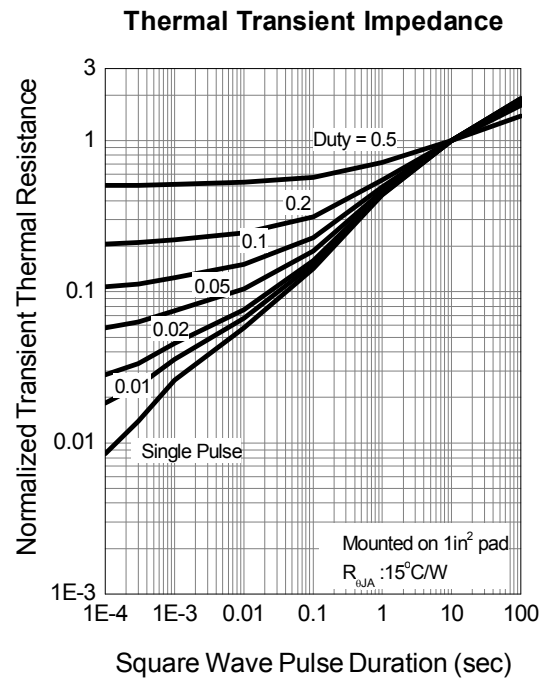
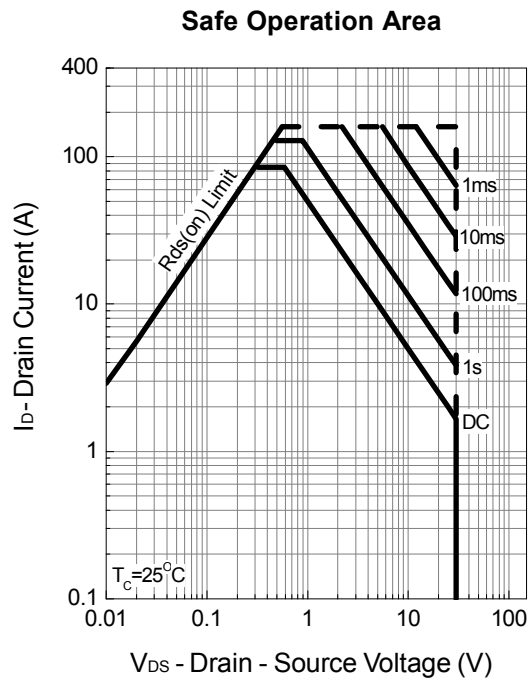
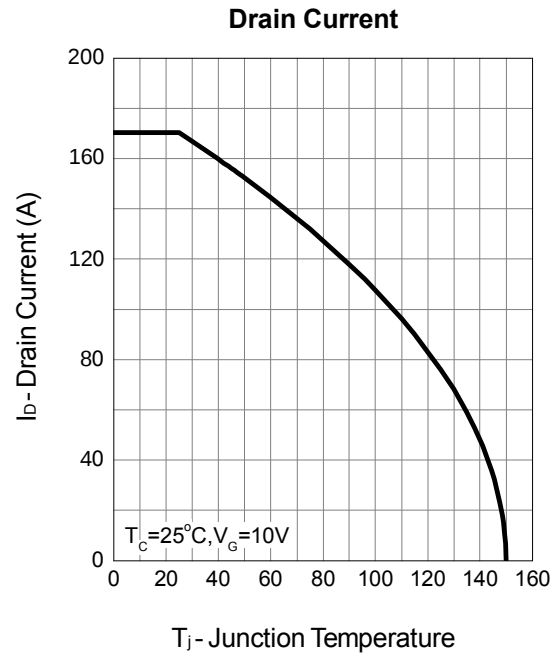
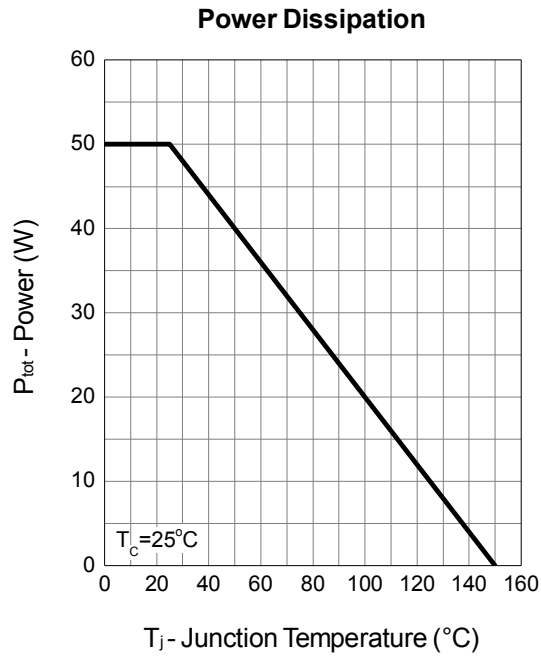
Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	40	-	-	V
BV _{DSS(t)}	Drain-Source Breakdown Voltage (transient)	V _{GS} =0V, I _{D(aval)} =30A T _{case} =25°C, t _{transient} =100ns	44	-	-	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	1.0	1.8	2.5	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} =30A	-	2.2	2.6	mΩ
		T _J =125°C	-	2.7	-	
		V _{GS} =4.5V, I _{DS} =15A	-	3	3.5	
Gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =15A	-	50	-	S
Diode Characteristics						
V _{SD} ^b	Diode Forward Voltage	I _{SD} =20A, V _{GS} =0V	-	0.8	1.1	V
t _{rr}	Reverse Recovery Time	I _{DS} =30A, dI _{SD} /dt=100A/μs	-	23	-	ns
t _a	Charge Time		-	13	-	
t _b	Discharge Time		-	11	-	
Q _{rr}	Reverse Recovery Charge		-	9	-	nC
Dynamic Characteristics ^c						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	1.4	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, Frequency=1.0MHz	-	2060	-	pF
C _{oss}	Output Capacitance		-	1160	-	
C _{rss}	Reverse Transfer Capacitance		-	35	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =15V, R _L =15Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	18	-	ns
t _r	Turn-on Rise Time		-	14	-	
t _{d(OFF)}	Turn-off Delay Time		-	46	-	
t _f	Turn-off Fall Time		-	19	-	
Gate Charge Characteristics ^c						
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =4.5V, I _{DS} =30A	-	6	-	nC
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =10V, I _{DS} =30A	-	10	-	
Q _{gth}	Threshold Gate Charge		-	0.8	-	
Q _{gs}	Gate-Source Charge		-	2	-	
Q _{gd}	Gate-Drain Charge		-	3.5	-	

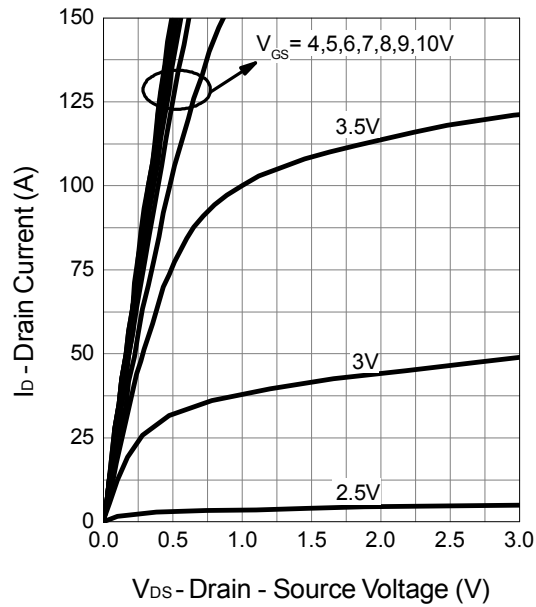
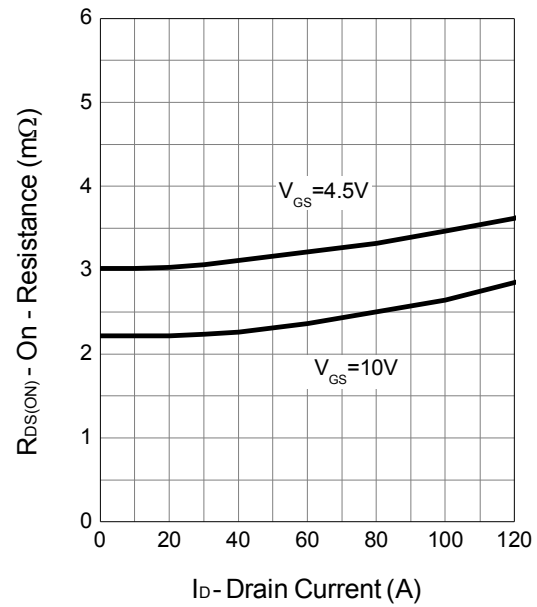
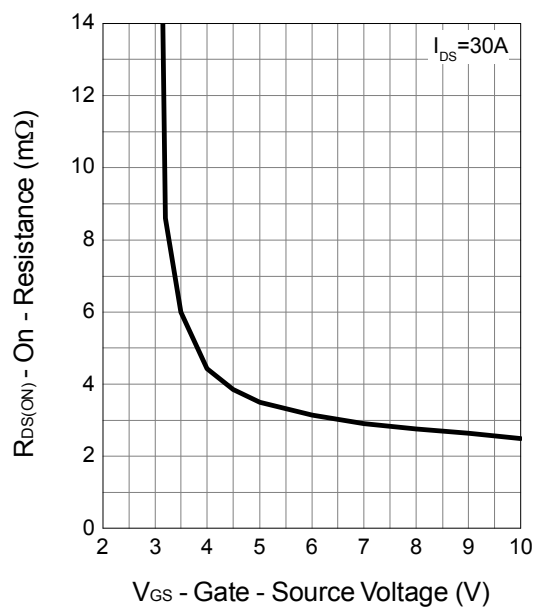
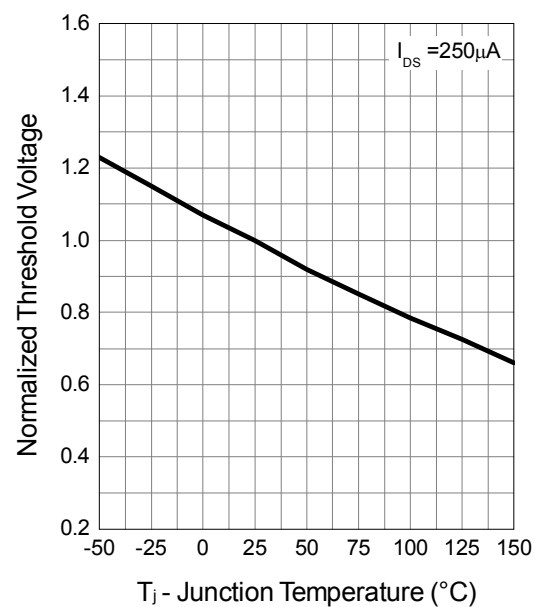
Note b : Pulse test; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

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

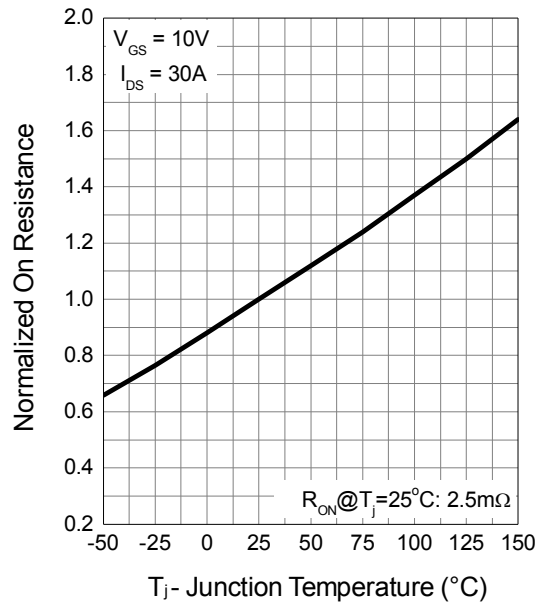
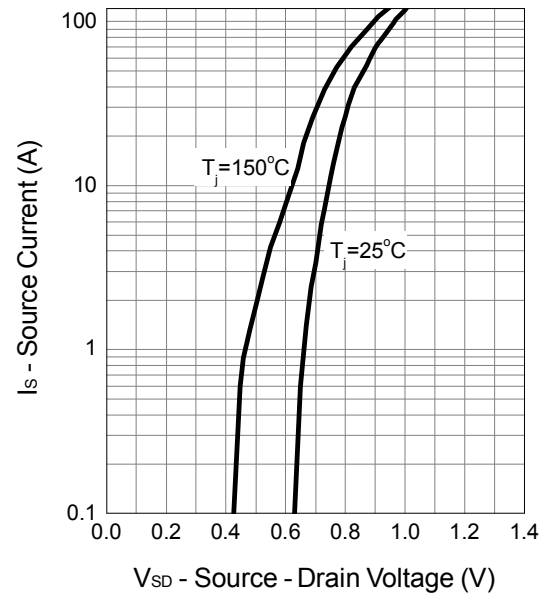
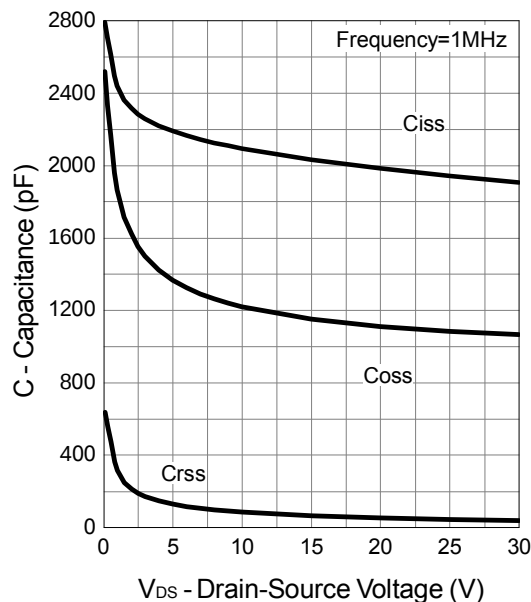
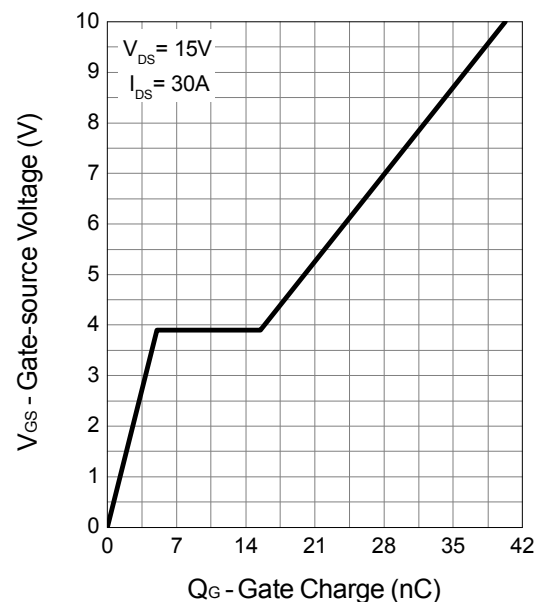
Typical Operating Characteristics



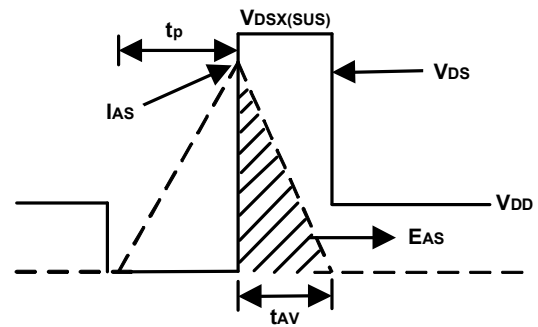
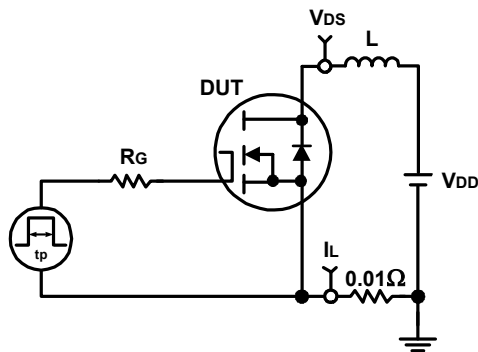
Typical Operating Characteristics (Cont.)

Output Characteristics

Drain-Source On Resistance

Gate-Source On Resistance

Gate Threshold Voltage


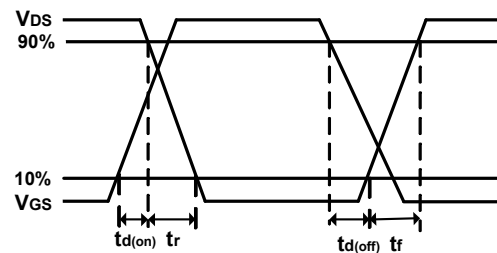
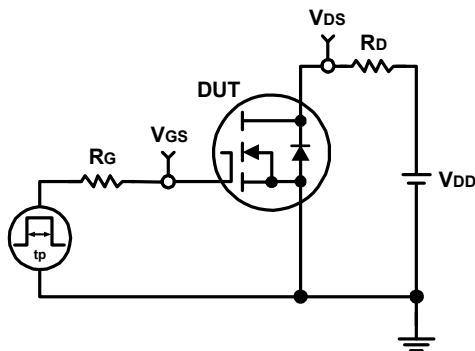
Typical Operating Characteristics (Cont.)

Drain-Source On Resistance

Source-Drain Diode Forward

Capacitance

Gate Charge


Avalanche Test Circuit and Waveforms

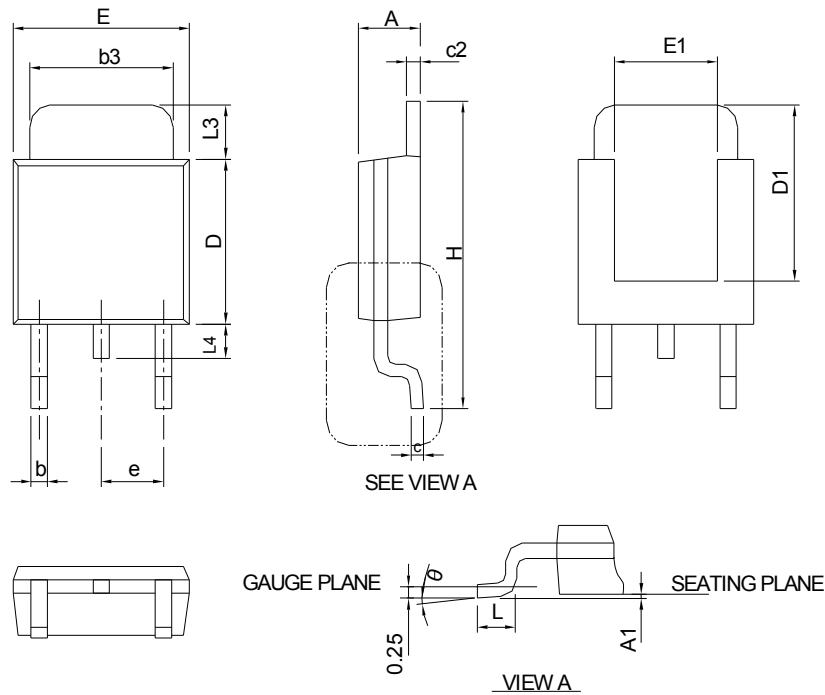


Switching Time Test Circuit and Waveforms



Package Information

TO-252-2



DIMENSIONS	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°

RECOMMENDED LAND PATTERN

