

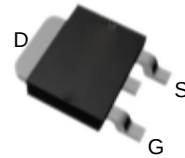
Features

- 30V/85A,
 $R_{DS(ON)} = 3.5m\Omega$ (typ.) @ $V_{GS} = 10V$
 $R_{DS(ON)} = 5.1m\Omega$ (typ.) @ $V_{GS} = 4.5V$
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)
- 100% UIS + R_g Tested

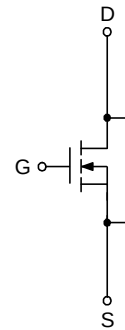
Applications

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

Pin Description



Top View of TO-252-2



N-Channel MOSFET

Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
Common Ratings ($T_A=25^{\circ}\text{C}$ Unless Otherwise Noted)			
V_{DSS}	Drain-Source Voltage	30	V
V_{GSS}	Gate-Source Voltage	± 20	
T_J	Maximum Junction Temperature	150	$^{\circ}\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^{\circ}\text{C}$
I_S	Diode Continuous Forward Current	85	A
I_{DP}	300 μs Pulse Drain Current Tested	$T_C=25^{\circ}\text{C}$	
		$T_C=100^{\circ}\text{C}$	
I_D	Continuous Drain Current	$T_C=25^{\circ}\text{C}$	
		$T_C=100^{\circ}\text{C}$	
P_D	Maximum Power Dissipation	$T_C=25^{\circ}\text{C}$	
		$T_C=100^{\circ}\text{C}$	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	Steady State	2.5
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	$t \leq 10\text{s}$	15
		Steady State	50
I_{AS}^a	Avalanche Current, Single pulse ($L=0.5\text{mH}$)	20	A
E_{AS}^a	Avalanche Energy, Single pulse ($L=0.5\text{mH}$)	100	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	$V_{GS}=0\text{V}$, $I_{DS}=250\mu\text{A}$	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=24\text{V}$, $V_{GS}=0\text{V}$	-	-	1	μA
		$T_J=85^{\circ}\text{C}$	-	-	30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$, $I_{DS}=250\mu\text{A}$	1.5	1.8	2.5	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20\text{V}$, $V_{DS}=0\text{V}$	-	-	± 100	nA
$R_{DS(on)}^b$	Drain-Source On-state Resistance	$V_{GS}=10\text{V}$, $I_{DS}=30\text{A}$	-	3.5	4.5	m Ω
		$T_J=125^{\circ}\text{C}$	-	5.3	-	
		$V_{GS}=4.5\text{V}$, $I_{DS}=20\text{A}$	-	5.1	6.9	
Gfs	Forward Transconductance	$V_{DS}=5\text{V}$, $I_{DS}=20\text{A}$	-	40	-	S

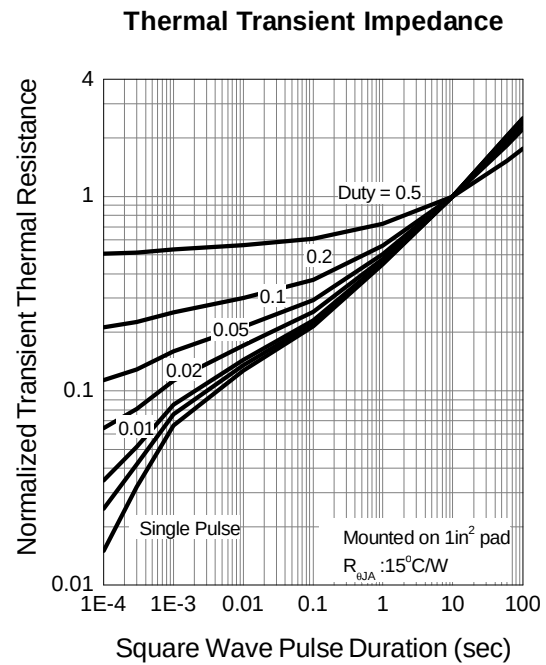
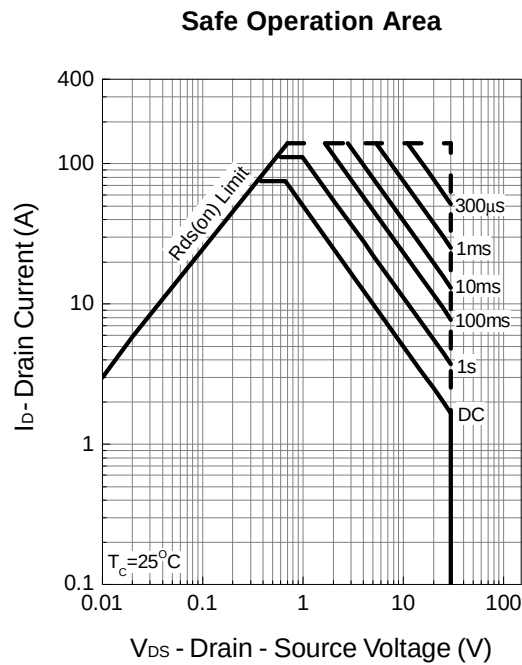
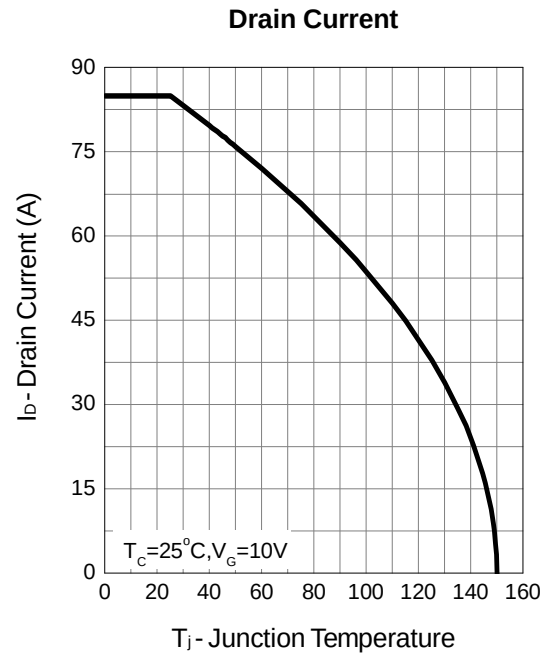
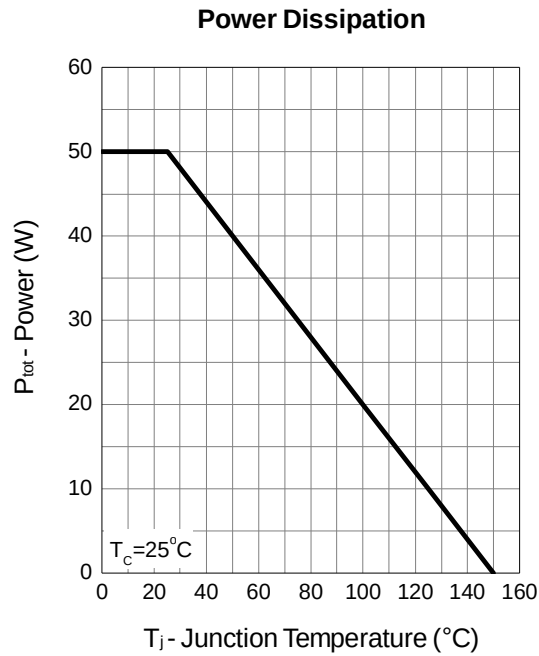
Electrical Characteristics (Cont.) ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
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 _F =20A, dI _{SD} /dt=100A/μs	-	14	-	ns
t _a	Charge Time		-	7.5	-	
t _b	Discharge Time		-	6.5	-	
Q _{rr}	Reverse Recovery Charge		-	6	-	nC
Dynamic Characteristics ^c						
R _G	Gate Resistance	V _{GS} =0V,V _{DS} =0V,F=1MHz	2.1	2.6	3.1	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, Frequency=1.0MHz	1344	1680	2016	pF
C _{oss}	Output Capacitance		175	250	325	
C _{rss}	Reverse Transfer Capacitance		96	160	224	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =15V, R _L =15Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	14	21	ns
t _r	Turn-on Rise Time		-	11	16	
t _{d(OFF)}	Turn-off Delay Time		-	51	75	
t _f	Turn-off Fall Time		-	17	25	
Gate Charge Characteristics ^c						
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =4.5V, I _{DS} =30A	-	14	20	nC
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =10V, I _{DS} =30A	-	31	43	
Q _{gth}	Threshold Gate Charge		-	1.4	2	
Q _{gs}	Gate-Source Charge		-	2.8	3.9	
Q _{gd}	Gate-Drain Charge		-	8	11.2	

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

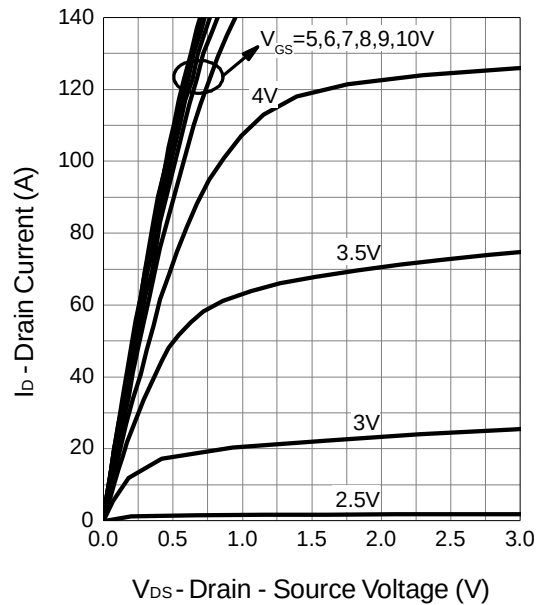
Note c : Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

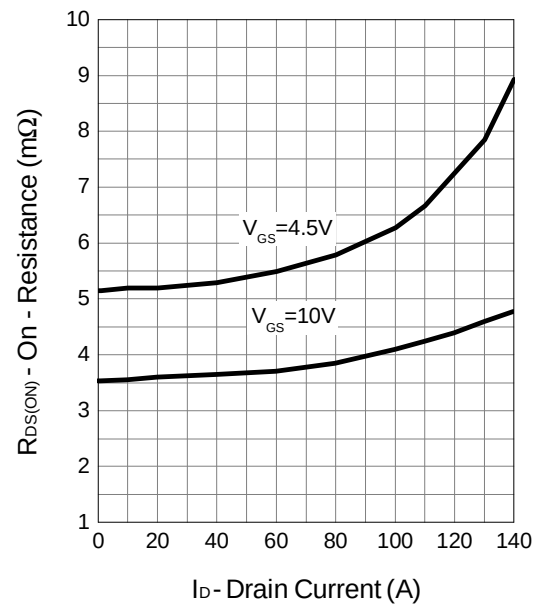


Typical Operating Characteristics (Cont.)

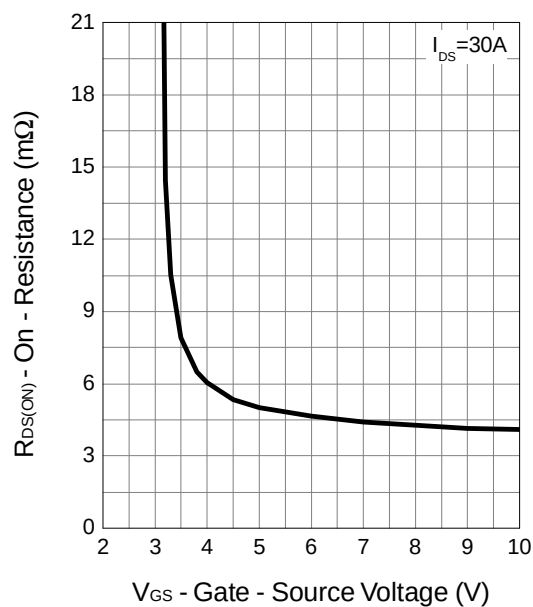
Output Characteristics



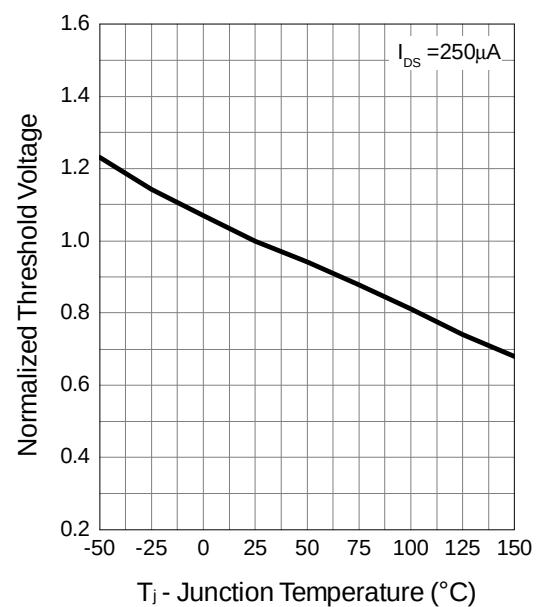
Drain-Source On Resistance



Gate-Source On Resistance

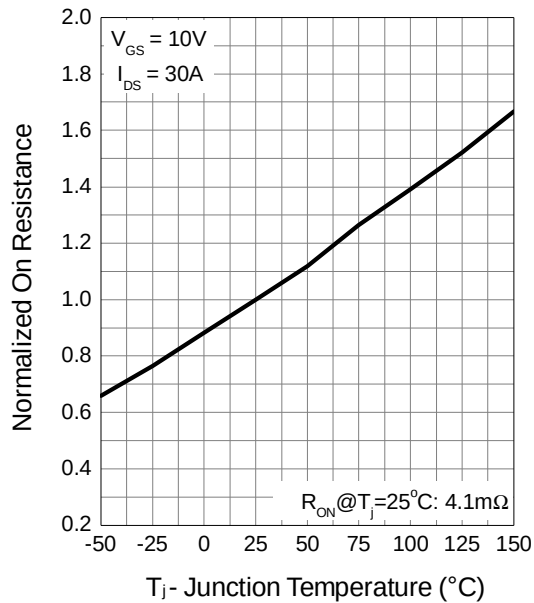


Gate Threshold Voltage

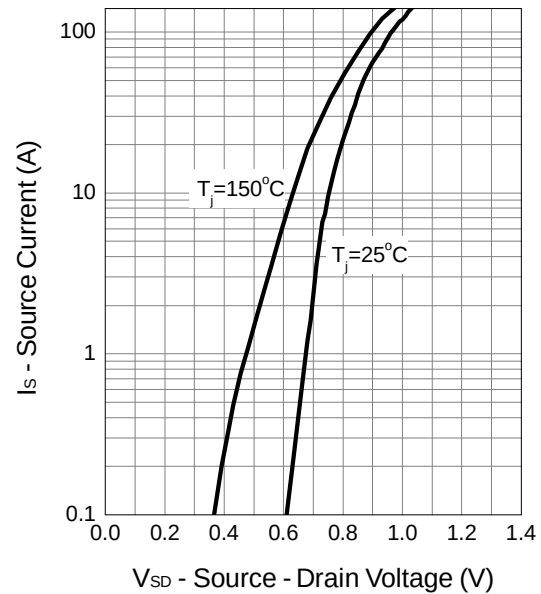


Typical Operating Characteristics (Cont.)

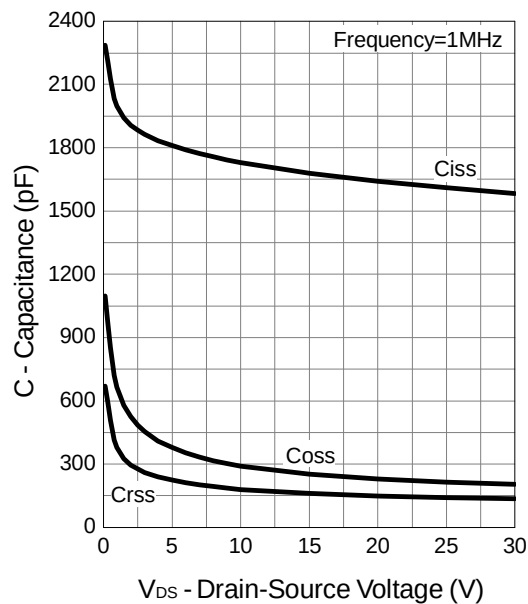
Drain-Source On Resistance



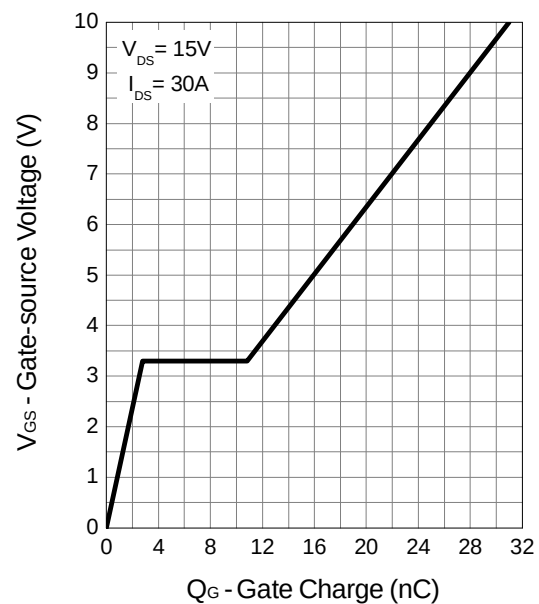
Source-Drain Diode Forward



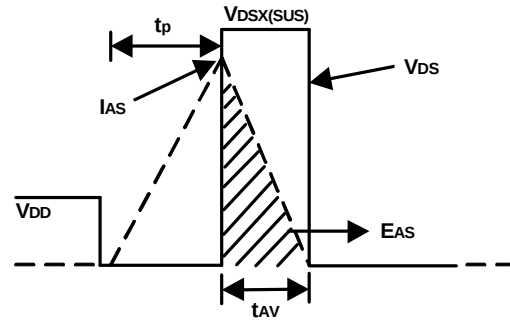
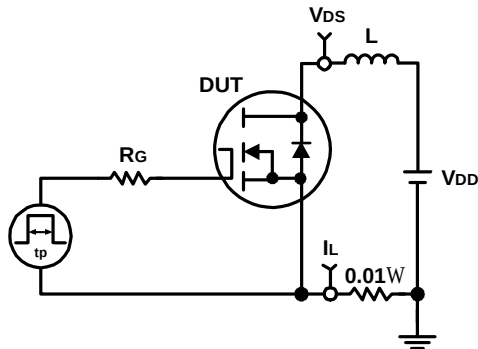
Capacitance



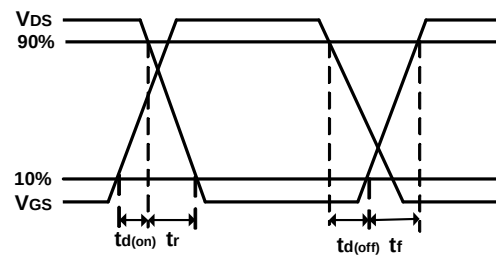
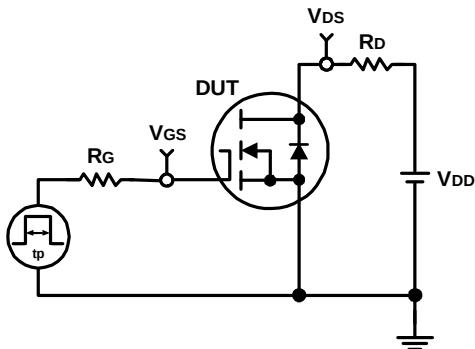
Gate Charge



Avalanche Test Circuit and Waveforms

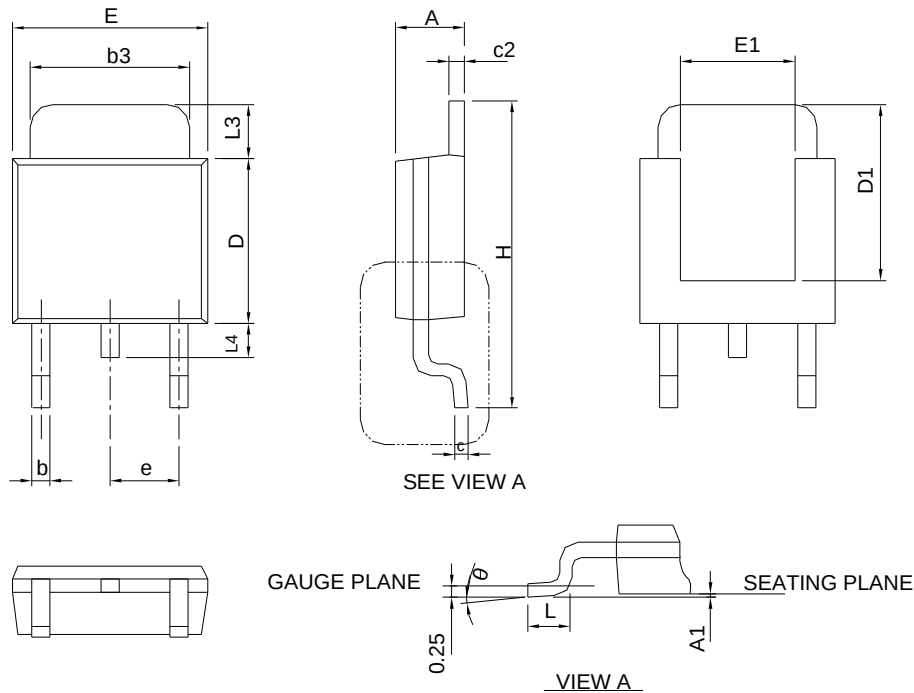


Switching Time Test Circuit and Waveforms



Package Information

TO-252-2



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

