

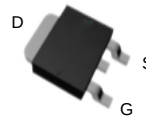
Features

- 500V/5A,
 $R_{DS(ON)} = 1.25\Omega(\text{typ.}) @ V_{GS} = 10V$
- 100% UIS + R_g Tested
- Reliable and Rugged
- Avalanche Rated
- Lead Free and Green Devices Available
(RoHS Compliant)

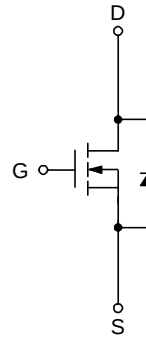
Applications

- AC/DC Power Conversion in Switched Mode Power Supplies (SMPS).
- Uninterruptible Power Supply (UPS),
- Adapter.

Pin Description



TO-252



N-Channel MOSFET

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

Symbol	Parameter		Rating	Unit
Common Ratings				
V _{DSS}	Drain-Source Voltage		500	V
V _{GSS}	Gate-Source Voltage		±30	
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	°C
I _S	Diode Continuous Forward Current		5	A
I _{DP}	Pulse Drain Current Tested	T _C =25°C	10	A
I _D	Continuous Drain Current	T _C =25°C	5	A
		T _C =100°C	2	
P _D	Maximum Power Dissipation for TO-220/TO-252-2/TO-251	T _C =25°C	65.8	W
		T _C =100°C	26.3	
P _D	Maximum Power Dissipation for TO-220FP	T _C =25°C	25	
		T _C =100°C	10	
R _{θJC}	Thermal Resistance-Junction to Case for TO-220/TO-252-2/TO-251		1.9	°C/W
R _{θJC}	Thermal Resistance-Junction to Case for TO-220FP		5	
R _{θJA}	Thermal Resistance-Junction to Ambient		62.5	
Drain-Source Avalanche Ratings				
dv/dt ^c	MOSFET dv/dt ruggedness		50	V/ns
E _{AS} ^d	Avalanche Energy, Single Pulsed		88	mJ
I _{AR} ^e	Avalanche Current		0.5	A
E _{AR} ^e	Repetitive Avalanche Energy		0.06	mJ

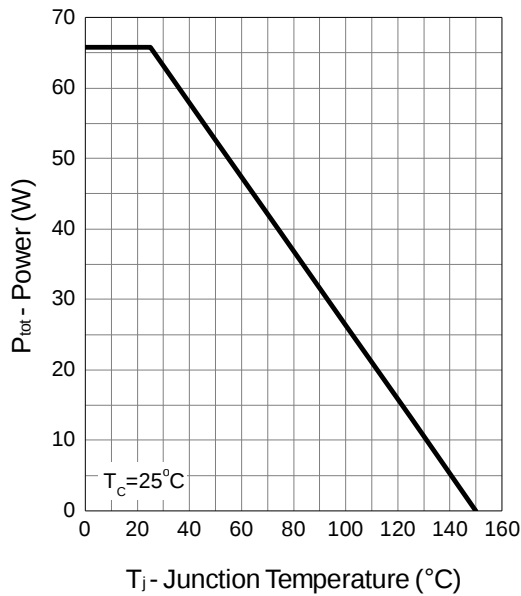
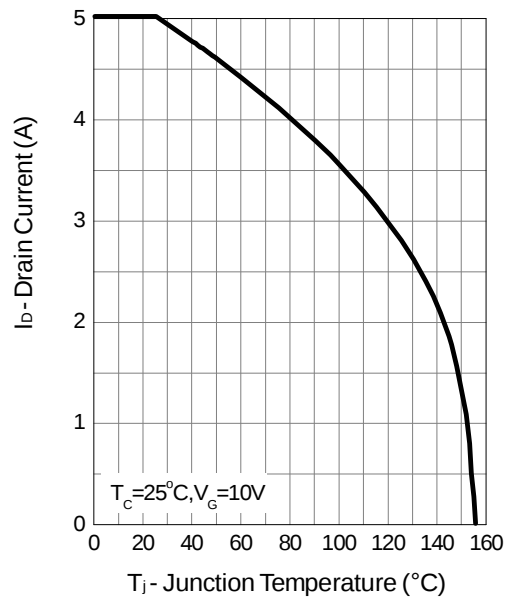
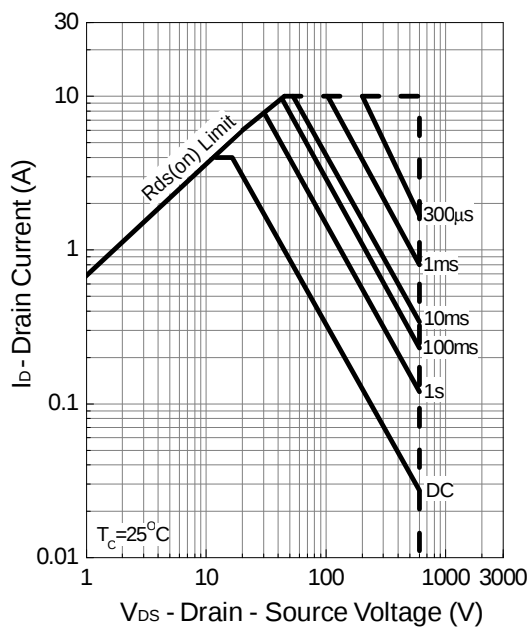
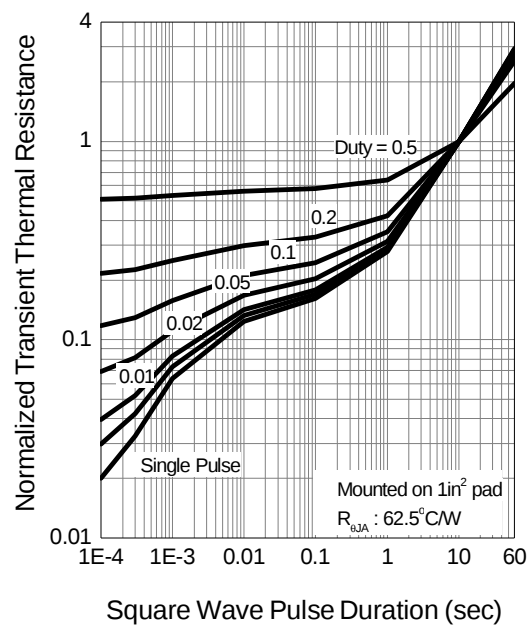
Electrical Characteristics (T_A = 25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	500	-	-	V
		T _J =150°C	-	600	-	
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =400V, V _{GS} =0V	-	-	1	μA
		T _J =150°C	-	-	200	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	2.5	3.5	4.5	V
I _{GSS}	Gate Leakage Current	V _{GS} =±30V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^f	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =2.5A	-	1.25	1.5	Ω
Diode Characteristics						
V _{SD} ^f	Diode Forward Voltage	I _{SD} =4A, V _{GS} =0V	-	0.96	1.3	V
t _{rr}	Reverse Recovery Time	I _{SD} =4A, V _R =360V dI _{SD} /dt=100A/μs	-	132	-	ns
Q _{rr}	Reverse Recovery Charge		-	0.75	-	μC
I _{rm}	Peak Reverse Recovery Current		-	9	-	A
Dynamic Characteristics ^g						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	4.2	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =25V, Frequency=1.0MHz	-	655	780	pF
C _{oss}	Output Capacitance		-	50	-	
C _{rss}	Reverse Transfer Capacitance		-	13	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =400V, I _{DS} =4A, V _{GEN} =10V, R _G =100Ω	-	8.5	-	ns
T _r	Turn-on Rise Time		-	20	-	
t _{d(OFF)}	Turn-off Delay Time		-	16	-	
T _f	Turn-off Fall Time		-	16	-	
Gate Charge Characteristics ^g						
Q _g	Total Gate Charge	V _{DS} =480V, V _{GS} =10V, I _{DS} =2A	-	12.5	16.3	nC
Q _{gs}	Gate-Source Charge		-	3.3	-	
Q _{gd}	Gate-Drain Charge		-	4.5	-	

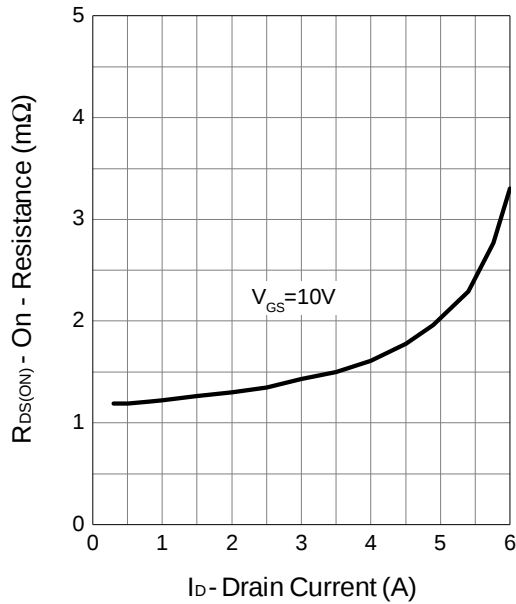
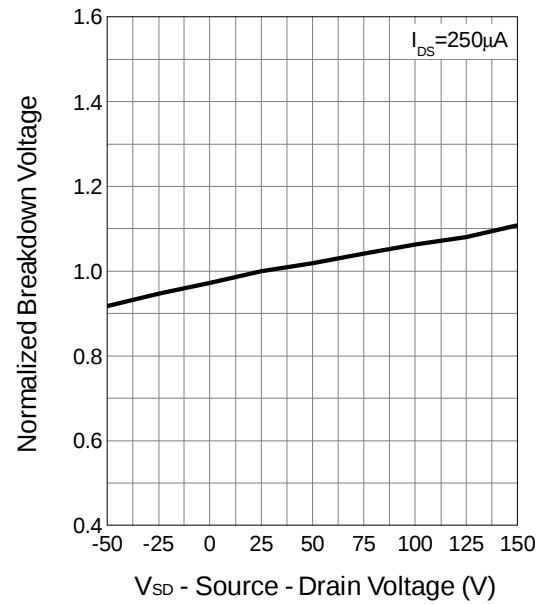
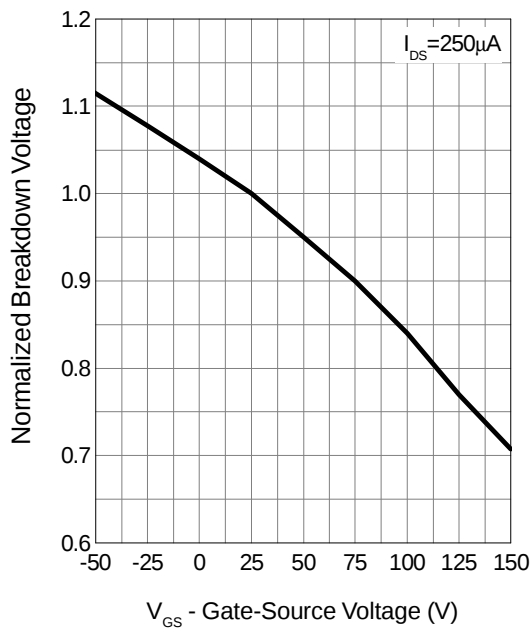
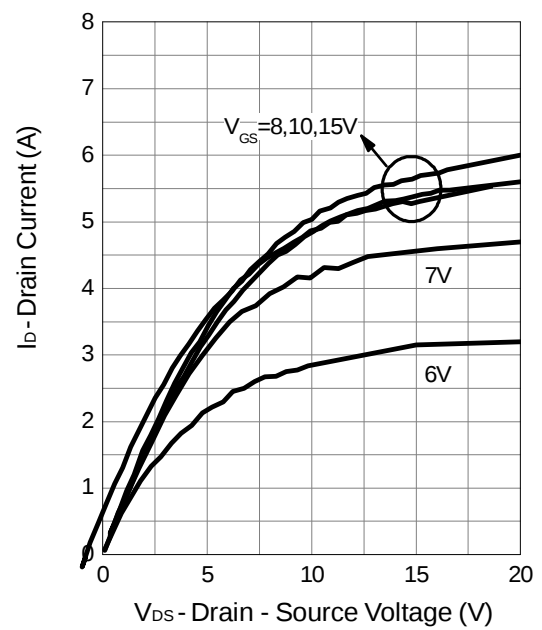
Note f : Pulse test; pulse width≤300μs, duty cycle≤2%.

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

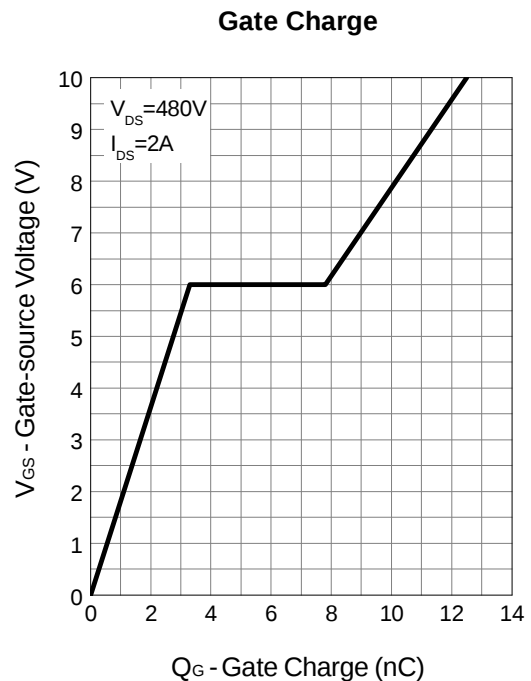
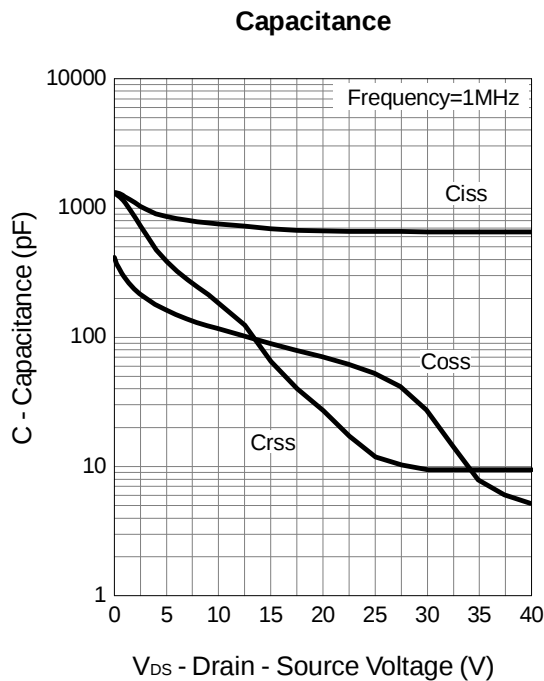
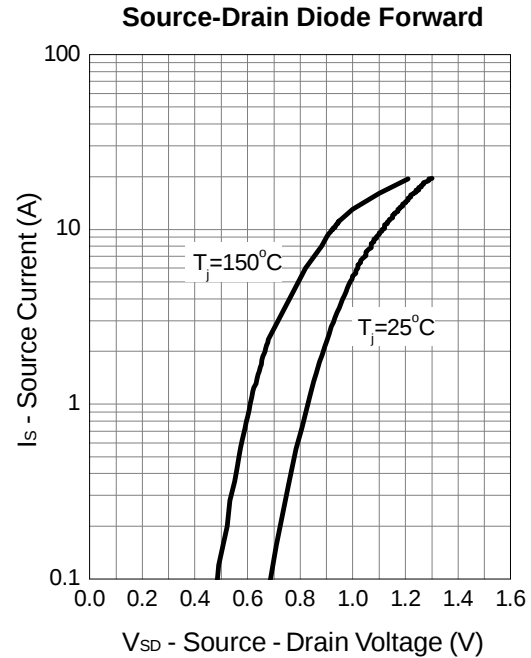
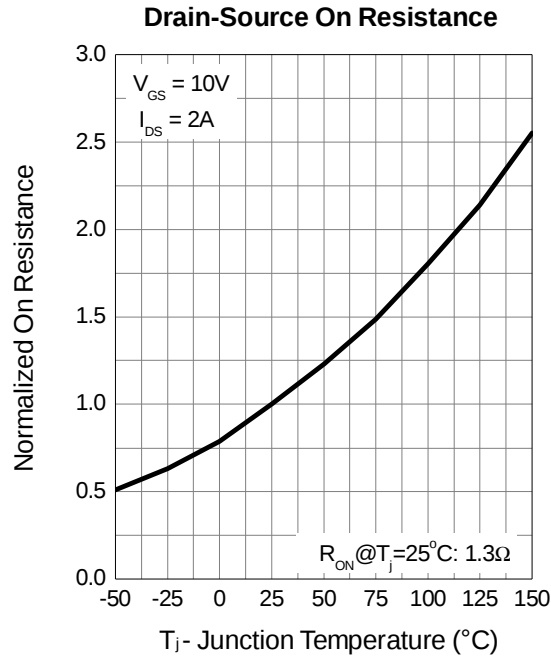
Typical Operating Characteristics

Power Dissipation

Drain Current

Safe Operation Area

Thermal Transient Impedance


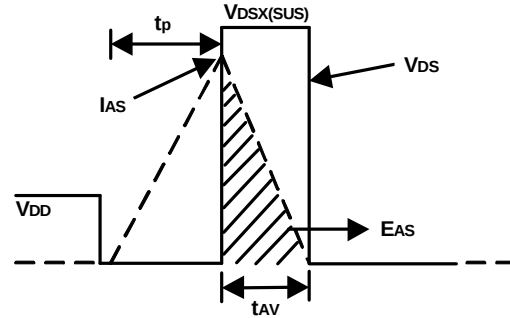
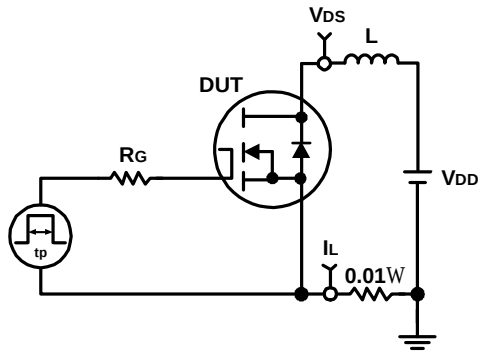
Typical Operating Characteristics (Cont.)

Drain-Source On Resistance

BVDSS vs Junction Temperature

 $V_{GS(th)}$ vs Junction Temperature

Output Characteristics


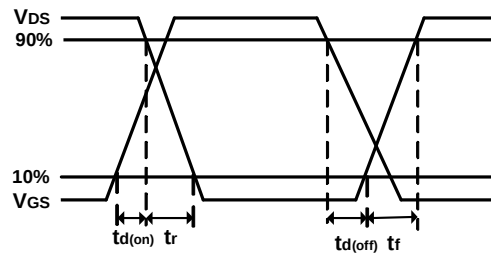
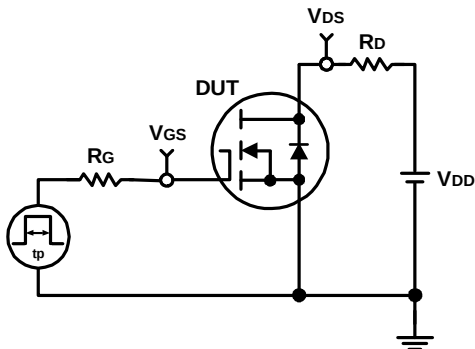
Typical Operating Characteristics (Cont.)



Avalanche Test Circuit and Waveforms

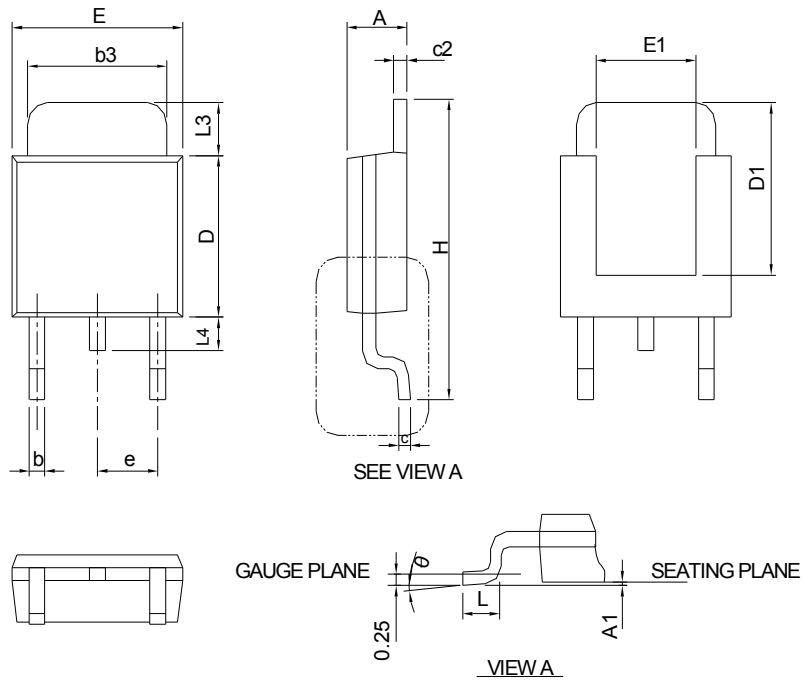


Switching Time Test Circuit and Waveforms



Package Information

TO-252



SYMBOL	TO-252			
	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

