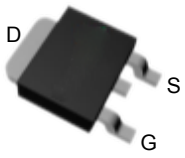
Features

- 20V/120A,
  $R_{DS(ON)}$= 2.1mΩ(typ.) @ V_{GS}=4.5V
  $R_{DS(ON)}$= 3.5mΩ(typ.) @ V_{GS}=2.5V
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available
  (RoHS Compliant)

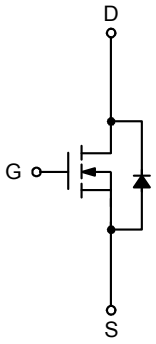
Applications

- Power Management in Secondary Rectifier
  For SMPS.

Pin Description



Top View of TO-252-2



N-Channel MOSFET

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

Symbol	Parameter		Rating	Unit
Common Ratings				
V_{DSS}	Drain-Source Voltage		20	V
V_{GSS}	Gate-Source Voltage		±12	
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	120	A
I_{DP} [b]	Pulse Drain Current Tested	T_C=25°C	360	A
I_D	Continuous Drain Current	T_C=25°C	120	A
		T_C=100°C	90	
P_D	Maximum Power Dissipation	T_C=25°C	100	W
		T_C=100°C	40	
$R_{\theta JC}$	Thermal Resistance-Junction to Case		1.2	°C/W
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		62.5	
E_{AS} [c]	Avalanche Energy, Single Pulsed	L=0.1mH	120	mJ

Note a：Max. continuous current is limited by bonding wire. Silicon limited current is 125A base on max. junction temperature.
Note b：Pulse width limited by max. junction temperature.
Note c：UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature T_j=25°C).

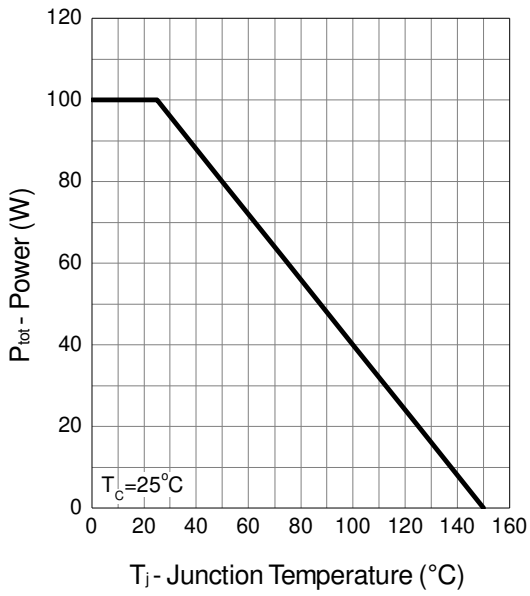
Electrical Characteristics (T_A = 25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=16V, V_{GS}=0V	-	-	1	μA
		T_J=85°C	-	-	30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	0.5	-	1	V
I_{GSS}	Gate Leakage Current	V_{GS}=±12V, V_{DS}=0V	-	-	±100	nA
$R_{DS(ON)}$ [d]	Drain-Source On-state Resistance	V_{GS}=4.5V, I_{DS}=40A	-	2.1	2.5	mΩ
		V_{GS}=2.5V, I_{DS}=32A	-	3.5	4.0	
Diode Characteristics						
V_{SD} [d]	Diode Forward Voltage	I_{SD}=32A, V_{GS}=0V	-	0.8	1.1	V
t_{rr}	Reverse Recovery Time	I_{SD}=40A, dI_{SD}/dt=100A/μs	-	27	-	ns
Q_{rr}	Reverse Recovery Charge		-	15	-	nC
Dynamic Characteristics [e]						
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	-	2275	-	pF
C_{oss}	Output Capacitance		-	502	-	
C_{rss}	Reverse Transfer Capacitance		-	214	-	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=15V, R_L=15Ω, I_{DS}=1A, V_{GEN}=10V, R_G=6Ω	-	20	37	ns
t_r	Turn-on Rise Time		-	16	30	
$t_{d(OFF)}$	Turn-off Delay Time		-	48	87	
t_f	Turn-off Fall Time		-	21	39	
Gate Charge Characteristics [e]						
Q_g	Total Gate Charge	V_{DS}=15V, V_{GS}=10V, I_{DS}=40A	-	43	-	nC
Q_g	Total Gate Charge	V_{DS}=15V, V_{GS}=4.5V, I_{DS}=40A	-	25	-	
Q_{gs}	Gate-Source Charge		-	7.3	-	
Q_{gd}	Gate-Drain Charge		-	12.3	-	

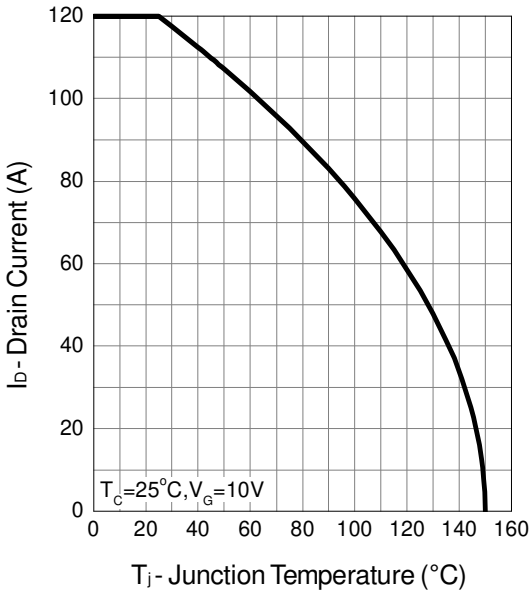
Note d：Pulse test ; pulse width≤300μs, duty cycle≤2%.
Note e：Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

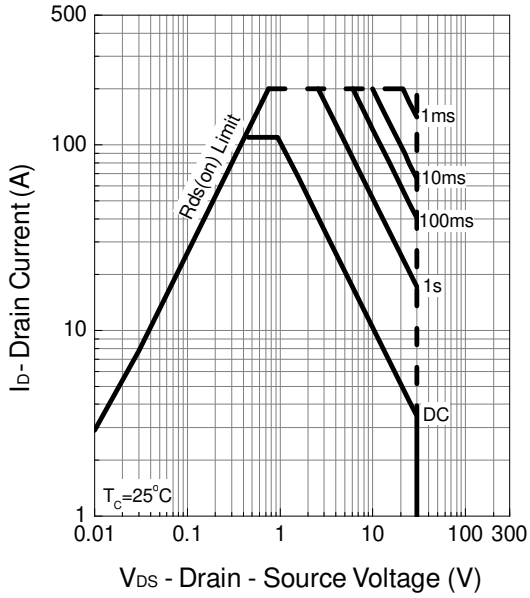
Power Dissipation



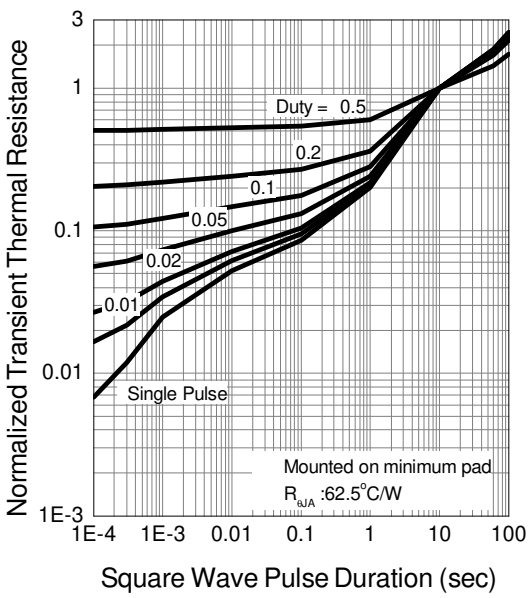
Drain Current



Safe Operation Area

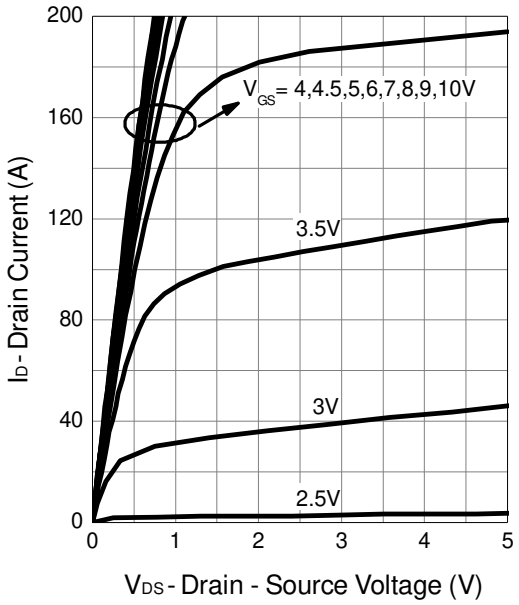


Thermal Transient Impedance

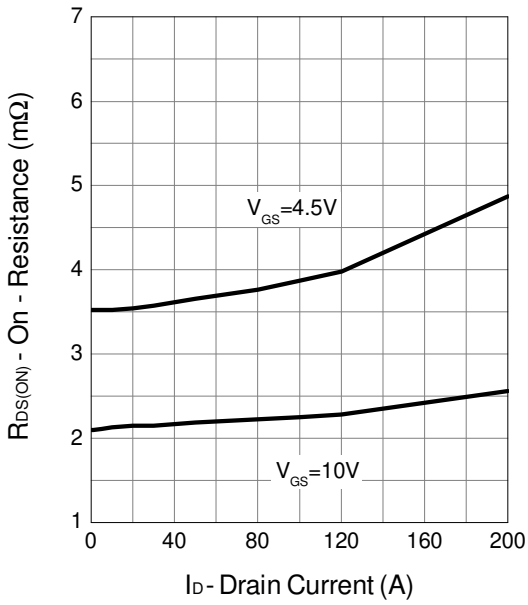


Typical Operating Characteristics (Cont.)

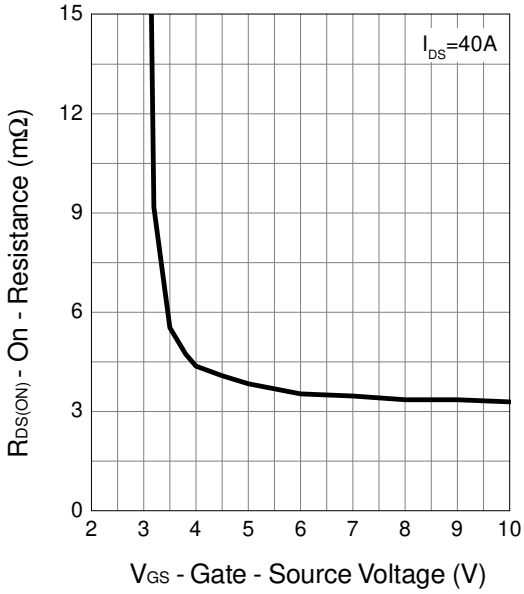
Output Characteristics



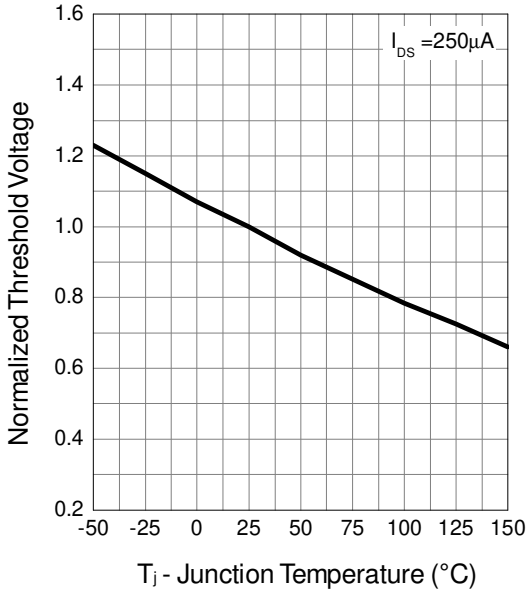
Drain-Source On Resistance



Gate-Source On Resistance

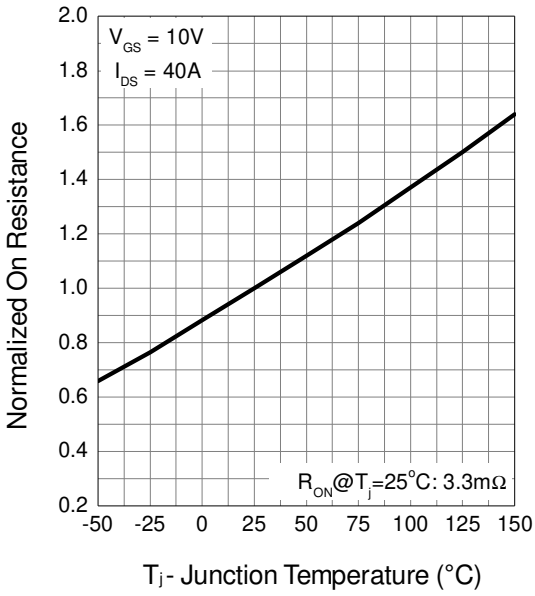


Gate Threshold Voltage

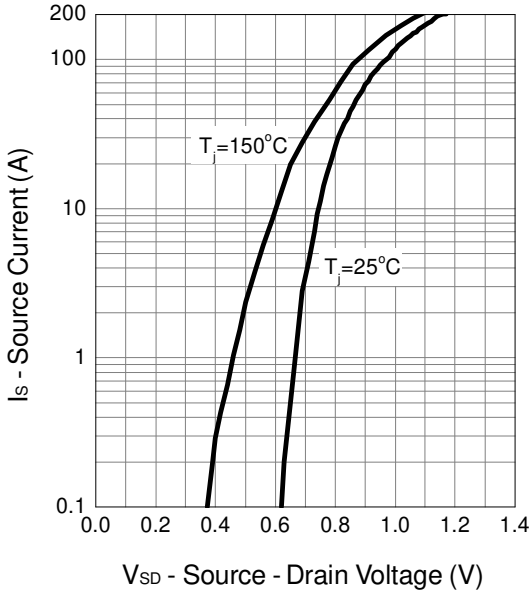


Typical Operating Characteristics (Cont.)

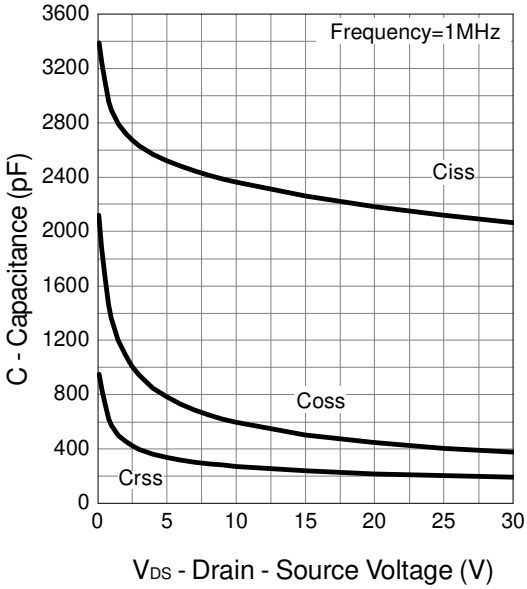
Drain-Source On Resistance



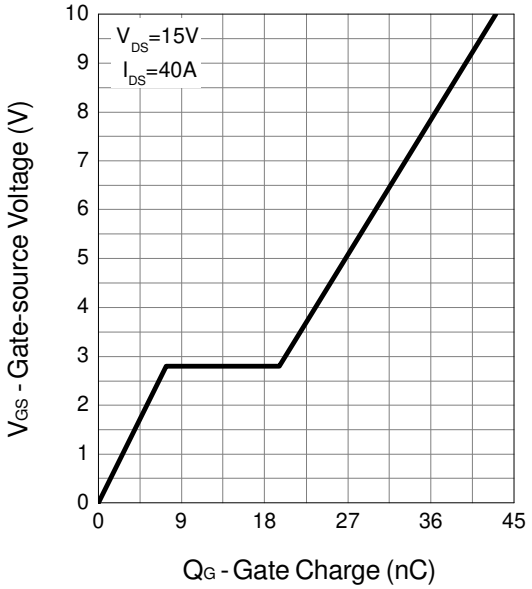
Source-Drain Diode Forward



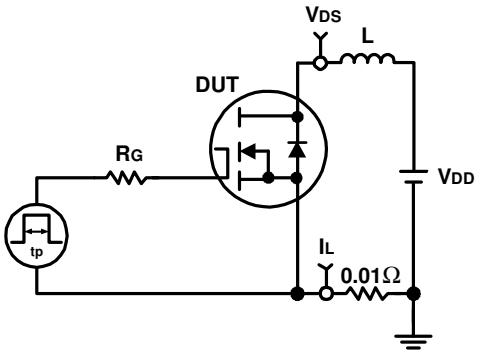
Capacitance

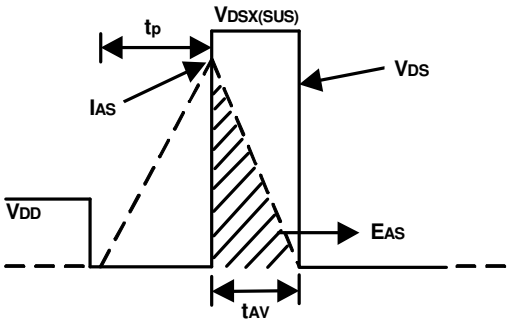


Gate Charge

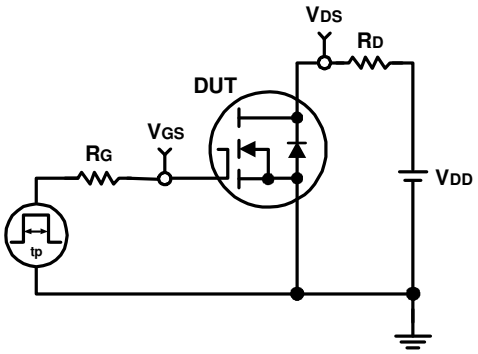


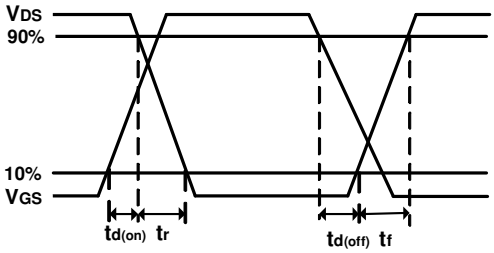
Avalanche Test Circuit and Waveforms



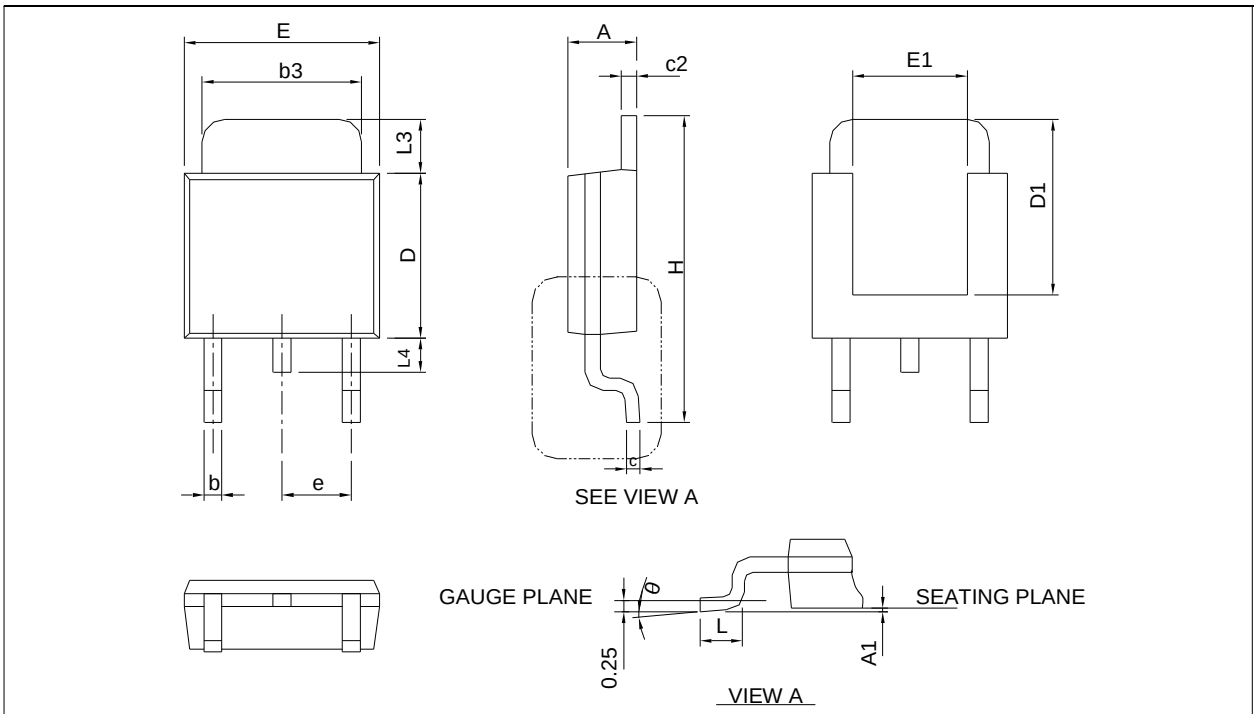


Switching Time Test Circuit and Waveforms





Package Information



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-252-2 .

RECOMMENDED LAND PATTERN