

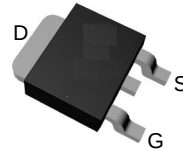
Features

- 20V/60A,
 $R_{DS(ON)} = 5\text{m}\Omega$ (Typ.) @ $V_{GS} = 4.5\text{V}$
 $R_{DS(ON)} = 6\text{m}\Omega$ (Typ.) @ $V_{GS} = 2.5\text{V}$
- Reliable and Rugged
- Avalanche Rated
- Lead Free and Green Devices Available (RoHS Compliant)
- 100% UIS + R_g Tested

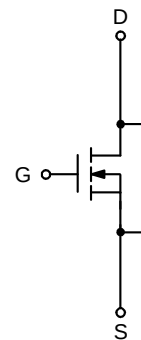
Applications

- 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	20	V
V_{GSS}	Gate-Source Voltage	± 12	
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	60	A
I_{DP}	300 μs Pulse Drain Current Tested	$T_C=25^{\circ}\text{C}$	A
		$T_C=100^{\circ}\text{C}$	
I_D	Continuous Drain Current	$T_C=25^{\circ}\text{C}$	A
		$T_C=100^{\circ}\text{C}$	
P_D	Maximum Power Dissipation	$T_C=25^{\circ}\text{C}$	W
		$T_C=100^{\circ}\text{C}$	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	2.5	$^{\circ}\text{C/W}$
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	50	$^{\circ}\text{C/W}$
E_{AS}	Drain-Source Avalanche Energy, $L=0.5\text{mH}$	225	mJ

Note : * Current limited by bond wire.

Electrical Characteristics ($T_A = 25^{\circ}\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Conditions				Unit
			Min.	Typ.	Max.	
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	0.4	0.7	1.0	V
I _{GSS}	Gate Leakage Current	V _{GS} =±12V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^a	Drain-Source On-state Resistance	V _{GS} =4.5V, I _{DS} =40A	-	5	8	mΩ
		V _{GS} =2.5V, I _{DS} =20A	-	6	10	
Diode Characteristics						
V _{SD} ^a	Diode Forward Voltage	I _{SD} =40A, V _{GS} =0V	-	0.85	1.1	V
t _{rr}	Reverse Recovery Time	I _{DS} =40A, dI _{SD} /dt=100A/μs	-	25	-	ns
Q _{rr}	Reverse Recovery Charge		-	10	-	nC

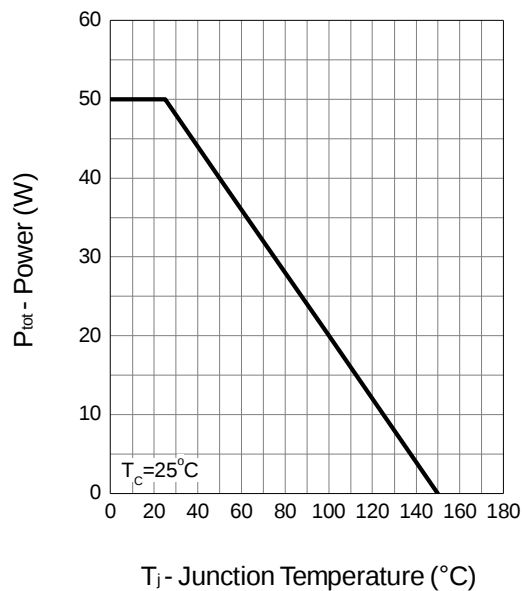
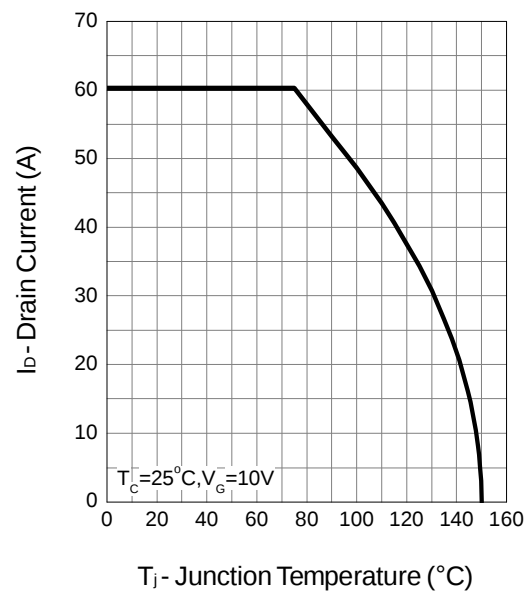
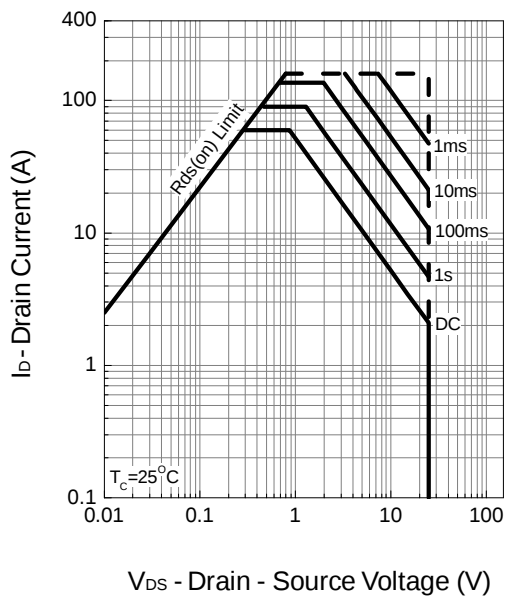
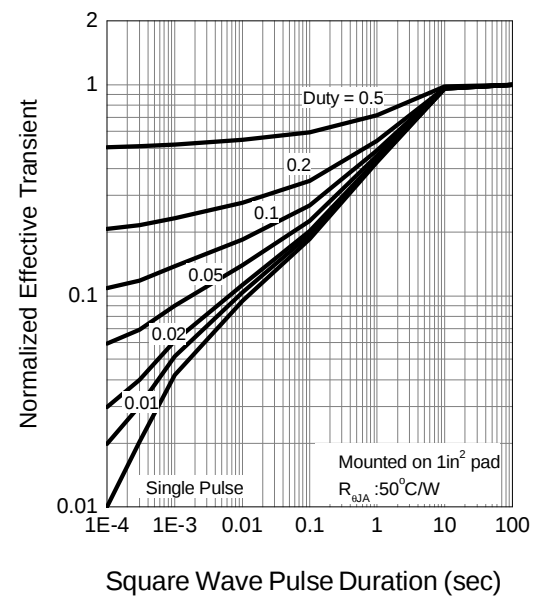
Electrical Characteristics (Cont.) ($T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	SM2558NUB			Unit
			Min.	Typ.	Max.	
Dynamic Characteristics ^b						
R _G	Gate Resistance	V _{GS} =0V,V _{DS} =0V,F=1MHz	-	1.6	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, Frequency=1.0MHz	-	2280	3000	pF
C _{oss}	Output Capacitance		-	512	-	
C _{rss}	Reverse Transfer Capacitance		-	409	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =15V, R _L =15Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	14	26	ns
t _r	Turn-on Rise Time		-	12	23	
t _{d(OFF)}	Turn-off Delay Time		-	49	89	
t _f	Turn-off Fall Time		-	21	39	
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =4.5V, I _{DS} =40A	-	22.5	32	nC
Q _{gs}	Gate-Source Charge		-	5.6	-	
Q _{gd}	Gate-Drain Charge		-	13	-	

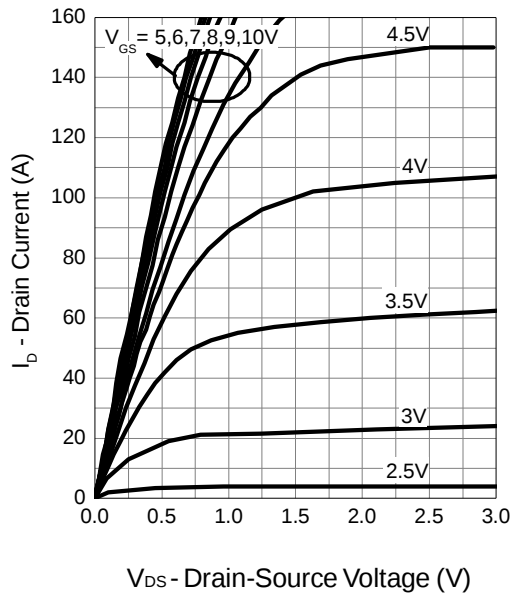
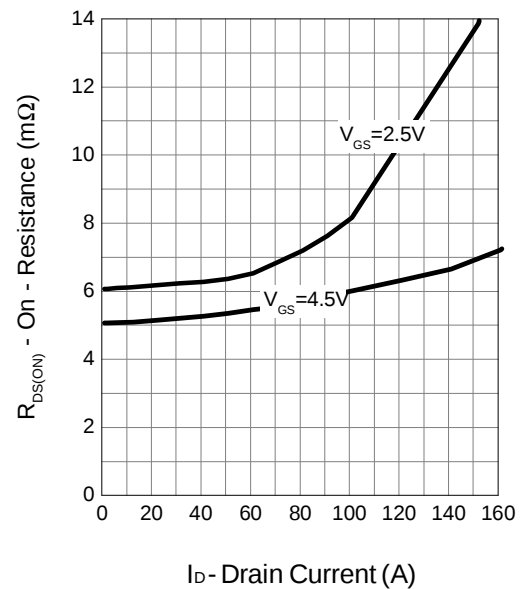
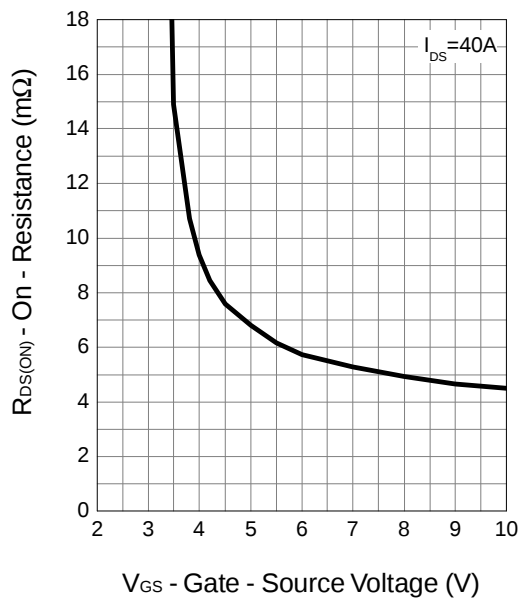
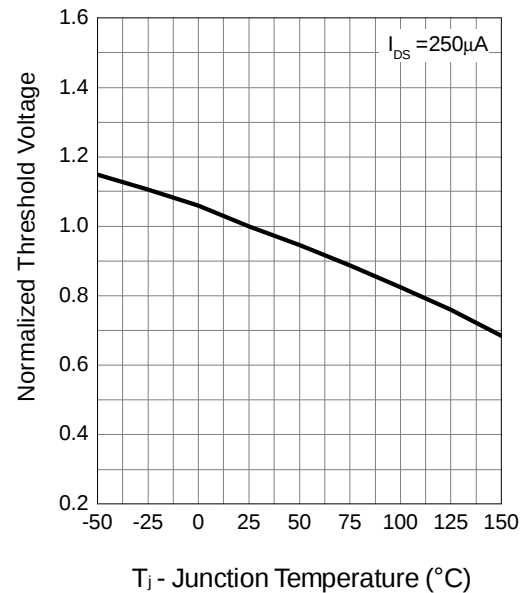
Note a : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

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

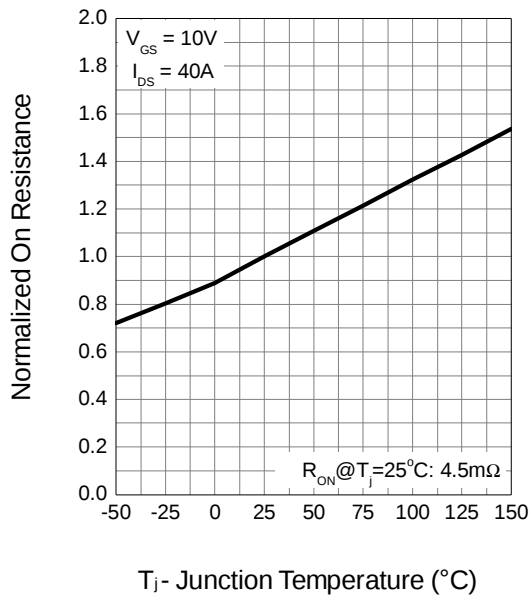
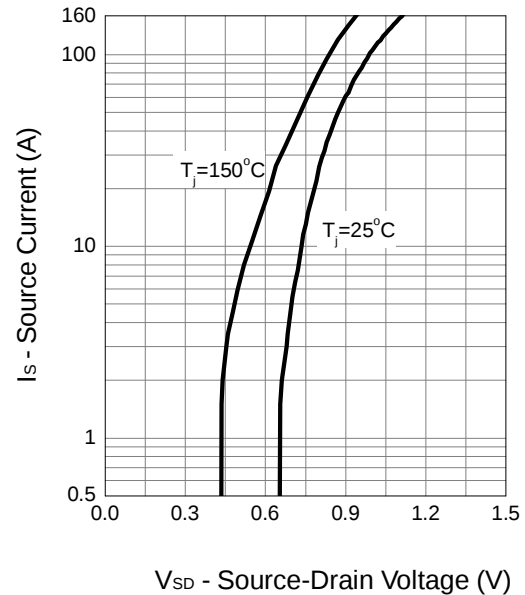
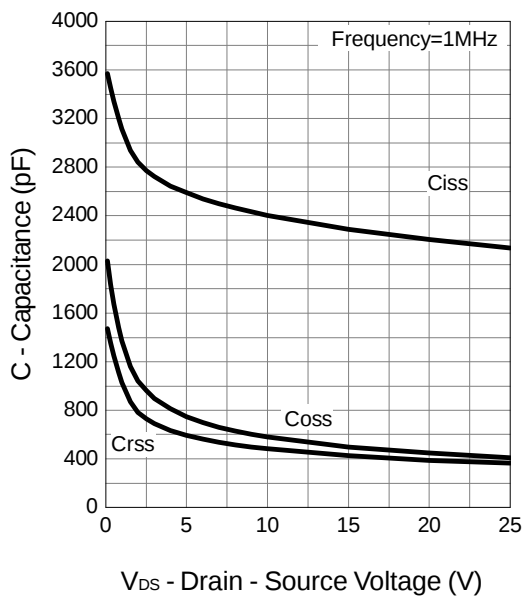
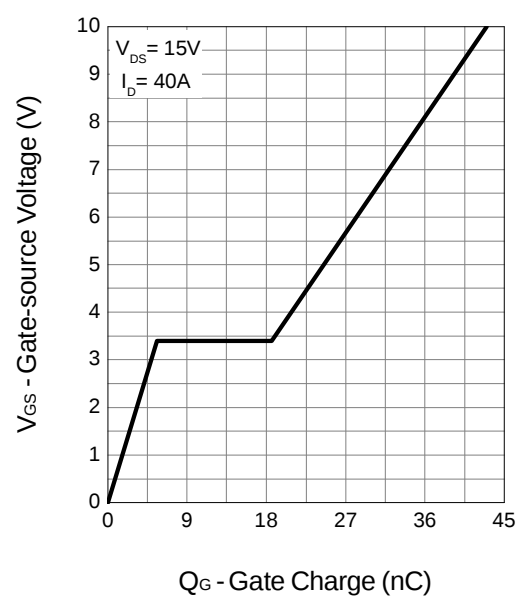
Typical Operating Characteristics

Power Dissipation

Drain Current

Safe Operation Area

Thermal Transient Impedance


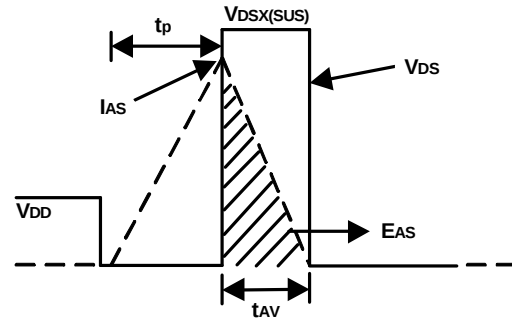
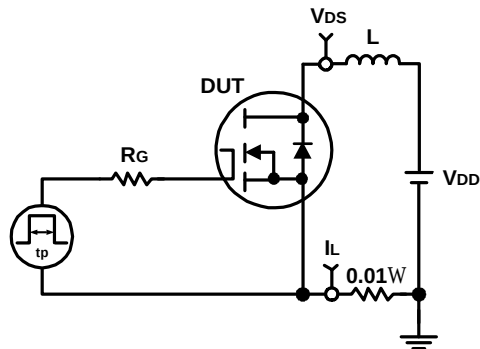
Typical Operating Characteristics (Cont.)

Output Characteristics

Drain-Source On Resistance

Gate-Source On Resistance

Gate Threshold Voltage


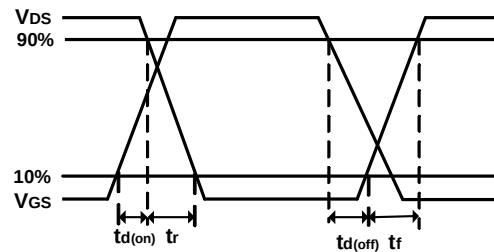
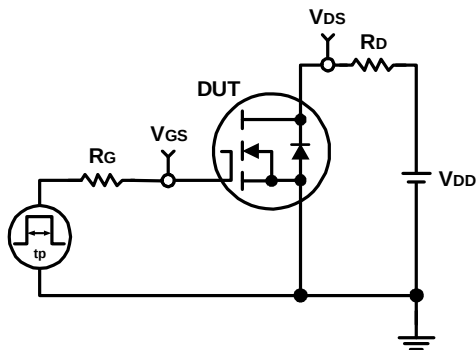
Typical Operating Characteristics (Cont.)

Drain-Source On Resistance

Source-Drain Diode Forward

Capacitance

Gate Charge


Avalanche Test Circuit and Waveforms

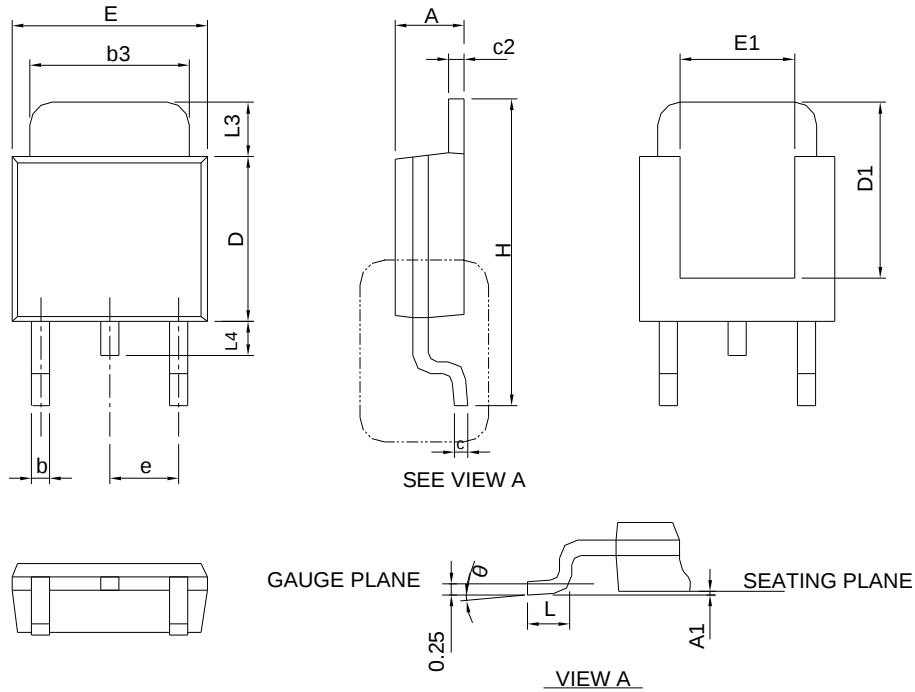


Switching Time Test Circuit and Waveforms



Package Information

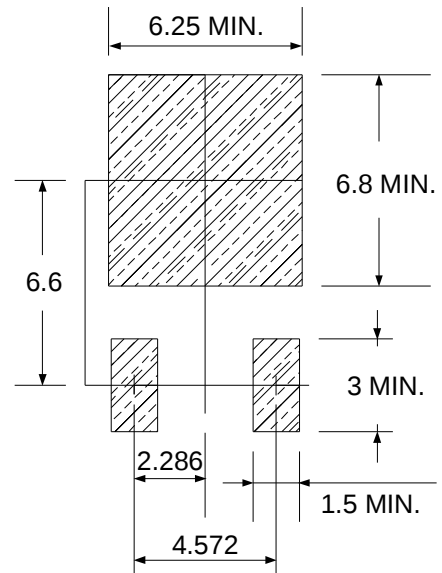
TO-252-2



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



UNIT: mm