

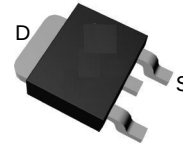
Features

- 40V/60A,
 $R_{DS(ON)} = 7.2\text{m}\Omega$ (Typ.) @ $V_{GS} = 10\text{V}$
 $R_{DS(ON)} = 9.2\text{m}\Omega$ (Typ.) @ $V_{GS} = 4.5\text{V}$
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

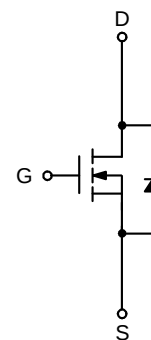
Applications

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

Pin Description



Top View of TO-252



N-Channel MOSFET

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T _A =25°C Unless Otherwise Noted)				
V _{DSS}	Drain-Source Voltage		40	V
BV _{DS(Avalanche)*}	Drain-Source Avalanche Voltage (Maximum)		45	
V _{GSS}	Gate-Source Voltage		±20	
T _J	Maximum Junction Temperature		175	°C
T _{STG}	Storage Temperature Range		-55 to 175	°C
I _S	Diode Continuous Forward Current		40	A
I _{DP}	300µs Pulse Drain Current Tested	T _C =25°C	160	A
		T _C =100°C	90	
I _D	Continuous Drain Current	T _C =25°C	60***	A
		T _C =100°C	48	
P _D	Maximum Power Dissipation	T _C =25°C	60	W
		T _C =100°C	30	
R _{θJC}	Thermal Resistance-Junction to Case		2.5	°C/W
R _{θJA}	Thermal Resistance-Junction to Ambient		50	°C/W
E _{AS**}	Drain-Source Avalanche Energy	L=0.5mH	100	mJ

Notes :

* Avalanche single pulse test and avalanche period time $t_{av} \leq 100 \mu s$, duty<1% .

** Avalanche test condition: T_J=25°C, L=0.5mH, I_{AS}=20A, V_{DD}=30V, and V_{GS}=10V.

*** Current limited by bond wire.

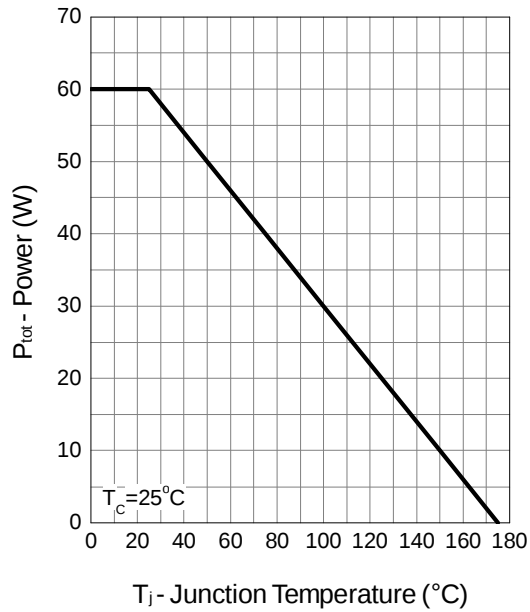
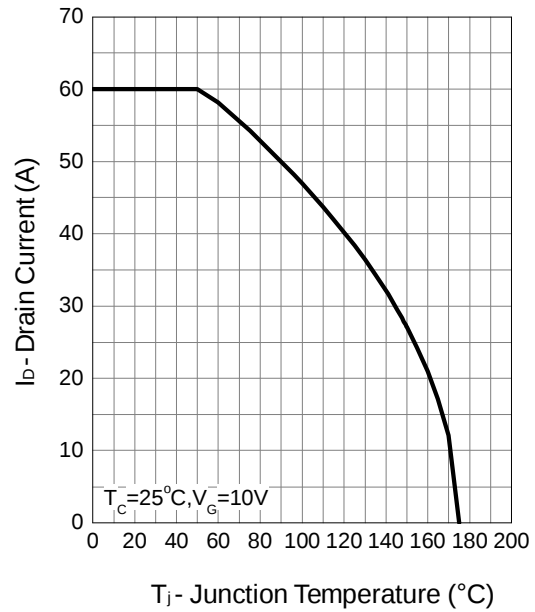
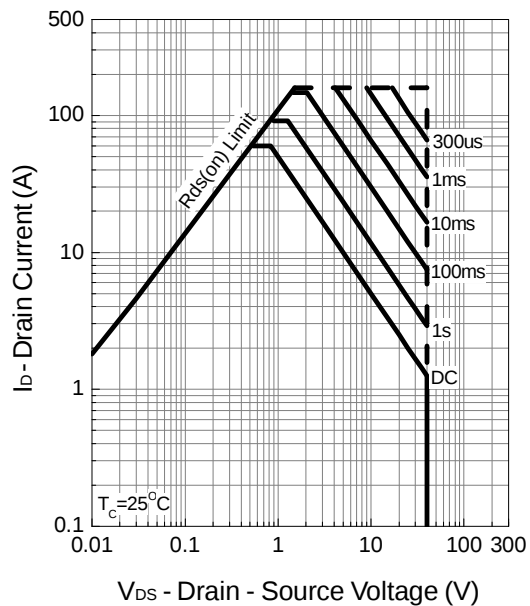
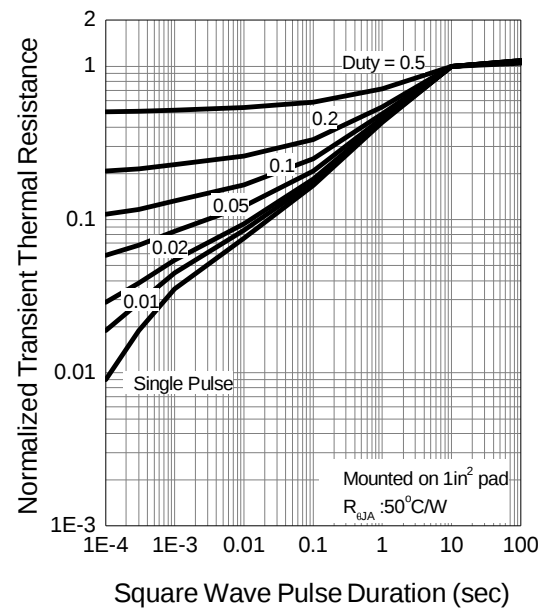
Electrical Characteristics (Cont.) ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	XP4184			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	40	-	-	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	1.2	1.6	2	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^a	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =20A	-	7.2	9	mΩ
		V _{GS} =4.5V, I _{DS} =10A	-	9.2	13	
Diode Characteristics						
V _{SD} ^a	Diode Forward Voltage	I _{SD} =20A, V _{GS} =0V	-	0.8	1.1	V
t _{rr}	Reverse Recovery Time	I _{DS} =40A, di _{SD} /dt=100A/μs	-	28	-	ns
Q _{rr}	Reverse Recovery Charge		-	24	-	nC
Dynamic Characteristics ^b						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	1.4	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =20V, Frequency=1.0MHz	-	1140	-	pF
C _{oss}	Output Capacitance		-	180	-	
C _{rss}	Reverse Transfer Capacitance	V _{DD} =20V, R _L =20Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	146	-	ns
t _{d(ON)}	Turn-on Delay Time		-	11	21	
t _r	Turn-on Rise Time		-	13	24	
t _{d(OFF)}	Turn-off Delay Time		-	37	67	
t _f	Turn-off Fall Time		-	11	21	
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{DS} =20V, V _{GS} =10V, I _{DS} =40A	-	31.2	44	nC
Q _{gs}	Gate-Source Charge		-	3.8	-	
Q _{gd}	Gate-Drain Charge		-	9	-	

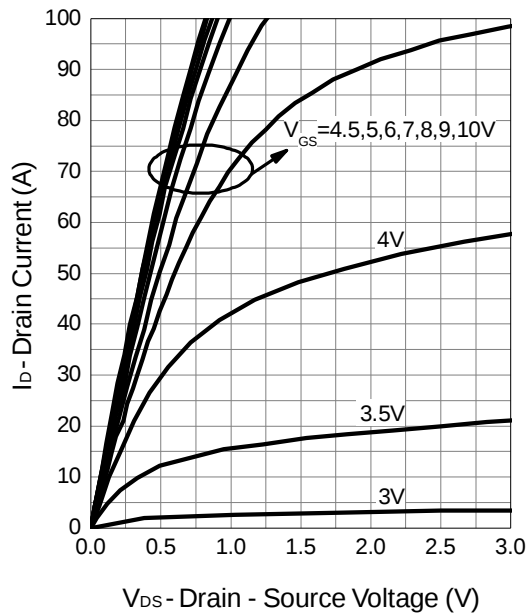
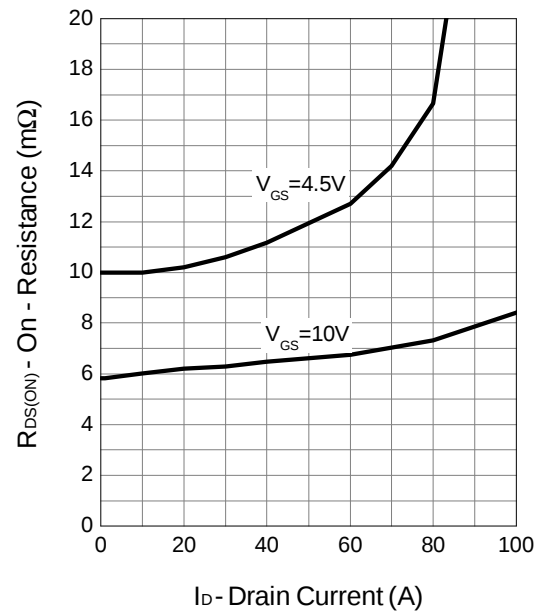
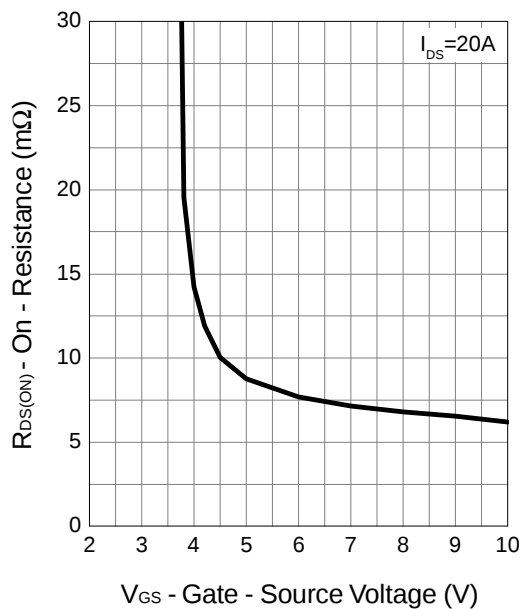
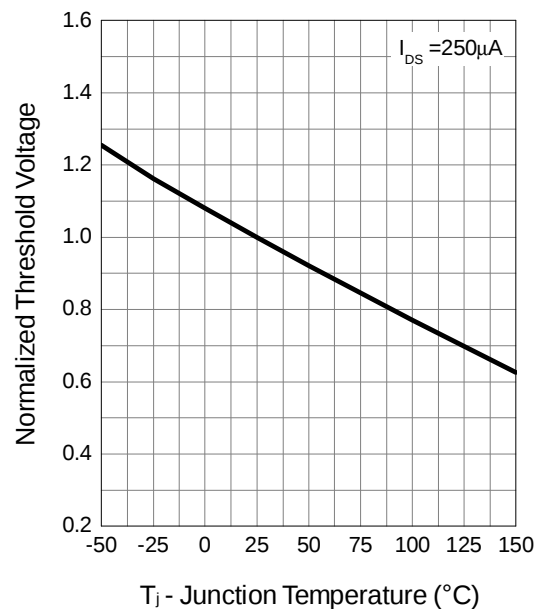
Note a : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

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

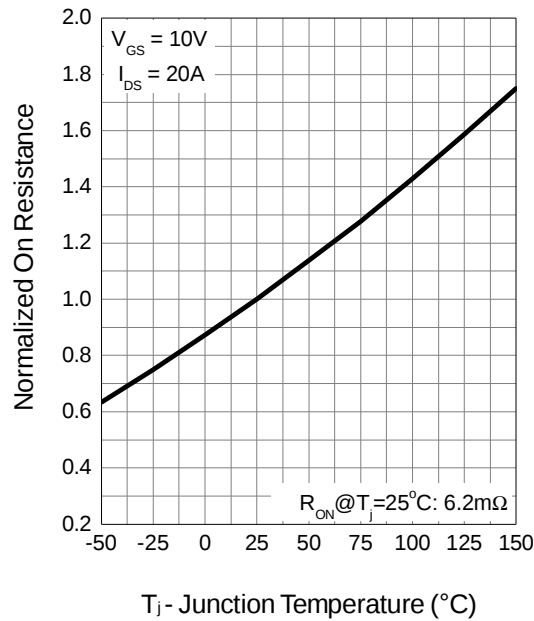
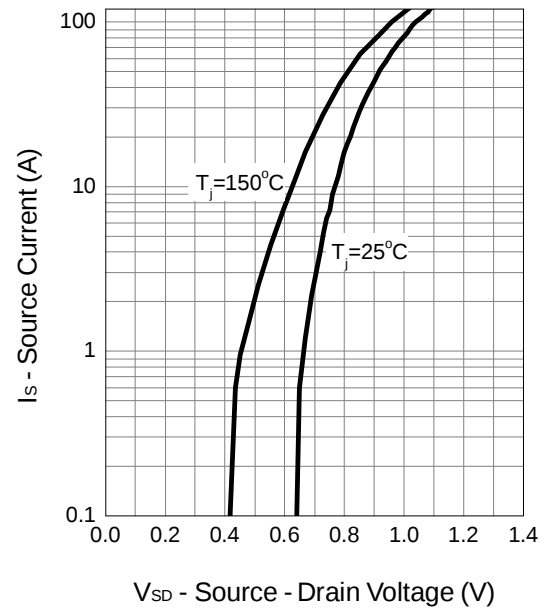
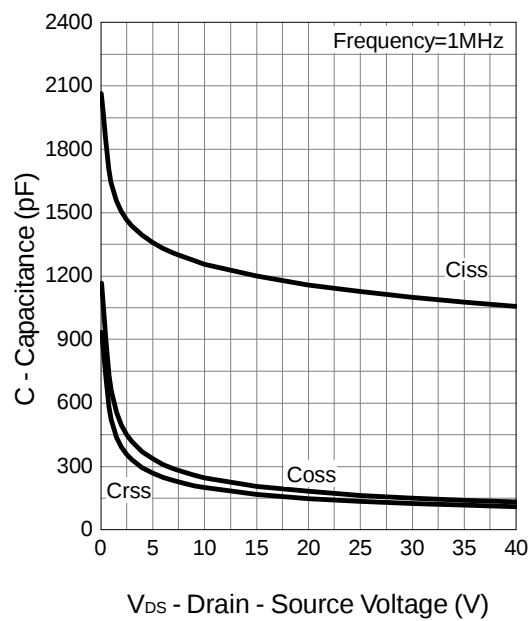
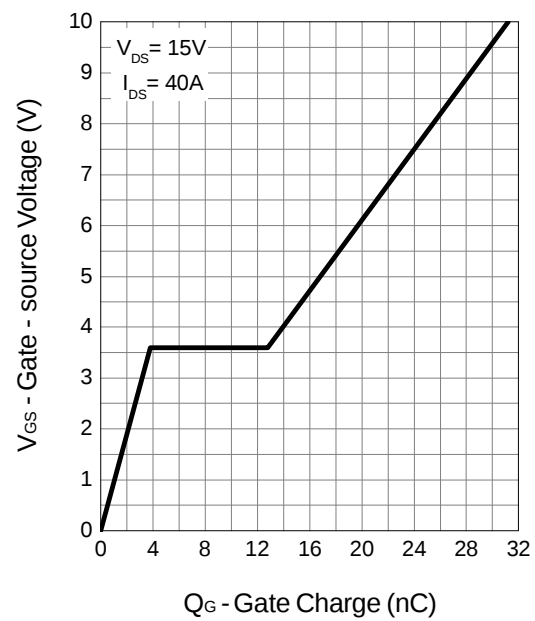
Typical Operating Characteristics

Power Dissipation

Drain Current

Safe Operation Area

Thermal Transient Impedance


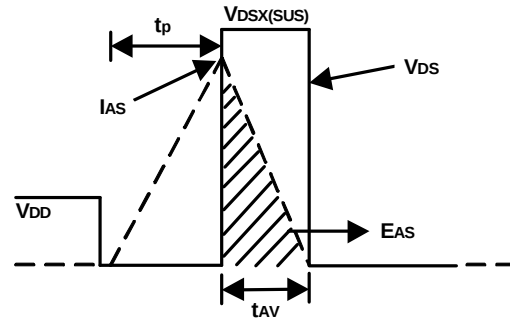
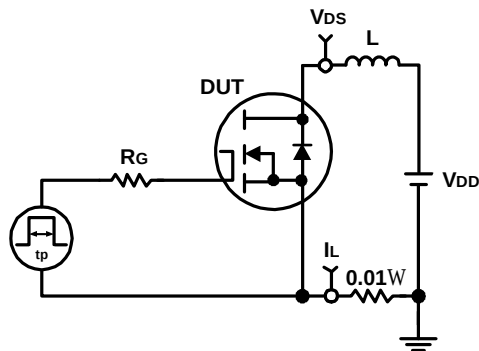
Typical Operating Characteristics (Cont.)

Output Characteristics

Drain-Source On Resistance

Gate-Source On Resistance

Gate Threshold Voltage


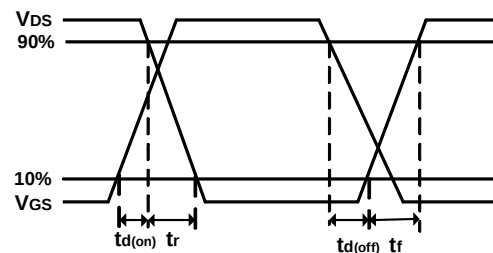
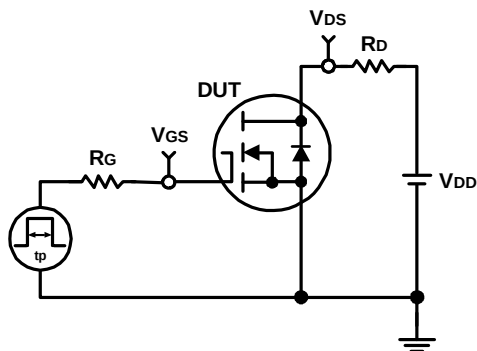
Typical Operating Characteristics (Cont.)

Drain-Source On Resistance

Source-Drain Diode Forward

Capacitance

Gate Charge


Avalanche Test Circuit and Waveforms

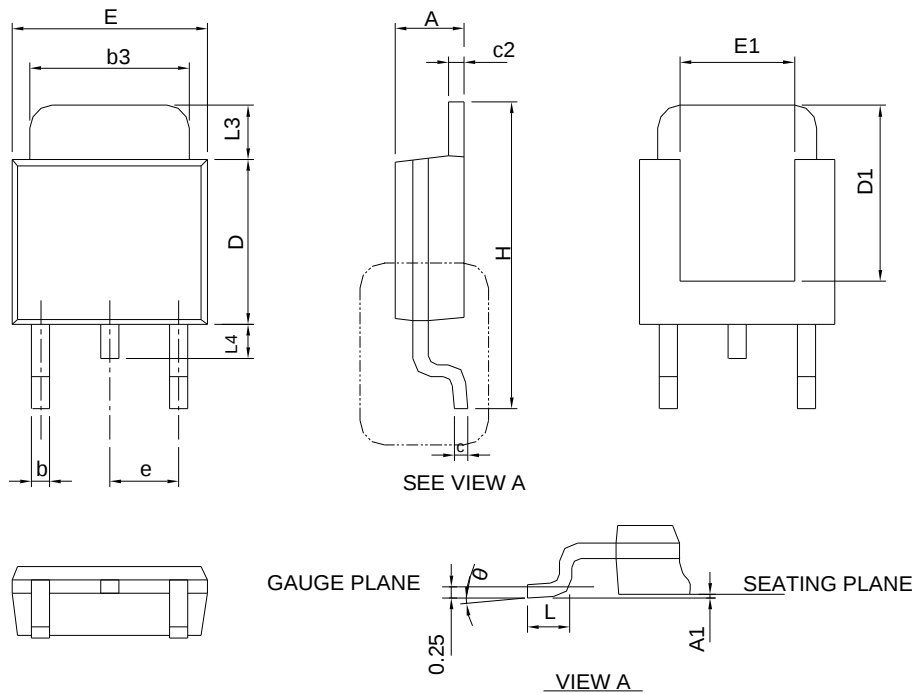


Switching Time Test Circuit and Waveforms



Package Information

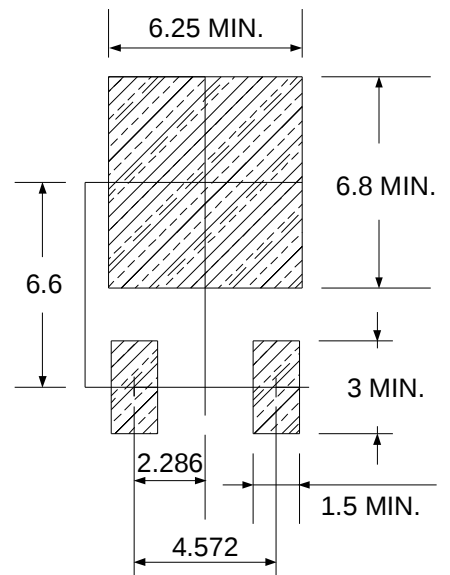
TO-252



DIMENSIONS	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



UNIT: mm