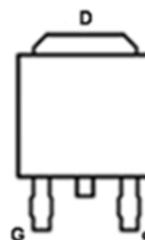


Main Product Characteristics:

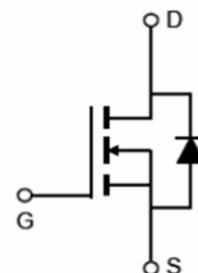
V_{DSS}	40V
$R_{DS(on)}$	6m Ω (Typ.)
I_D	80A



TO-252 (DPAK)



Pin Assignments



Schematic Diagram

Features and Benefits:

- Advanced MOSFET process technology
- Special designed for PWM, load switching and general purpose applications
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- 150°C operating temperature


Description:

It utilizes the latest processing techniques to achieve the high cell density and reduces the on-resistance with high repetitive avalanche rating. These features combine to make this design an extremely efficient and reliable device for use in power switching application and a wide variety of other applications.

Absolute Max Rating:

Symbol	Parameter	Max.	Units
I_D @ TC = 25°C	Continuous Drain Current, V_{GS} @ 10V ^①	80	A
I_{DM}	Pulsed Drain Current ^②	120	
P_D @ TC = 25°C	Power Dissipation ^③	44	W
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy @ L=0.1mH	76	mJ
I_{AS}	Avalanche Current	39	A
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +150	°C

Thermal Resistance

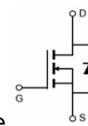
Symbol	Characteristics	Typ.	Max.	Units
R _{θJC}	Junction-to-case ③	—	2.8	°C/W
R _{θJA}	Junction-to-Ambient ④	—	62	°C/W

Electrical Characterizes @T_A=25°C unless otherwise specified

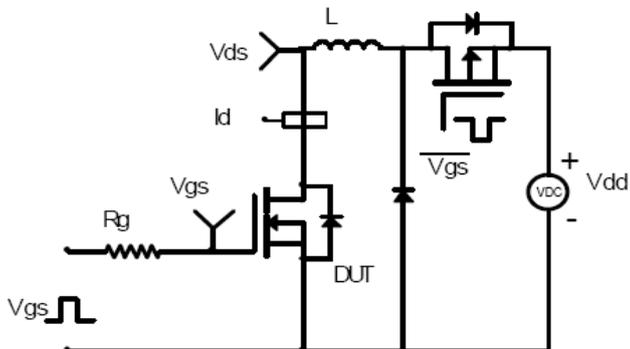
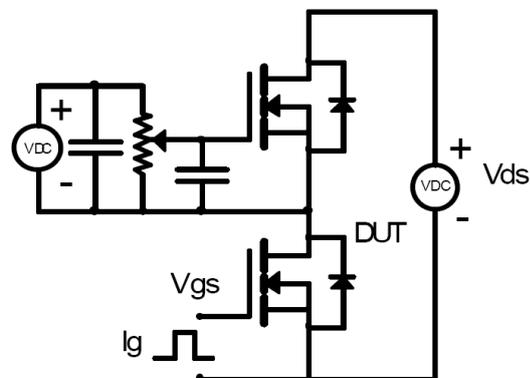
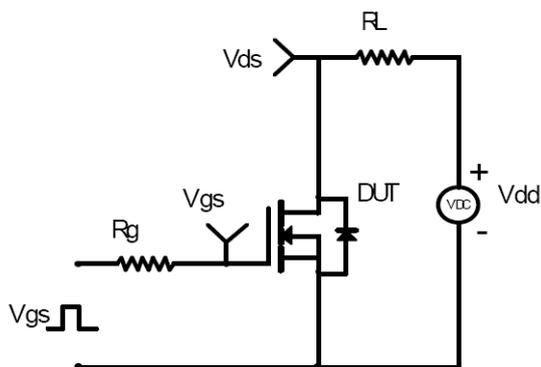
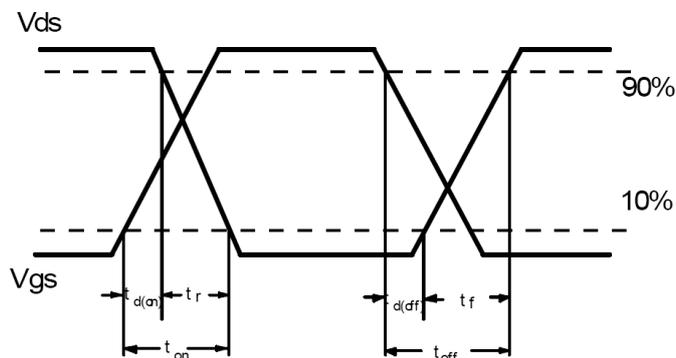
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
V _{(BR)DSS}	Drain-to-Source breakdown voltage	40	—	—	V	V _{GS} = 0V, I _D = 250μA
R _{DS(on)}	Static Drain-to-Source on-resistance	—	9	12	mΩ	V _{GS} =4.5V, I _D =10A
		—	6	7.5	mΩ	V _{GS} =10V, I _D =12A
V _{GS(th)}	Gate threshold voltage	1	—	2.5	V	V _{DS} = V _{GS} , I _D =250μA
I _{DSS}	Drain-to-Source leakage current	—	—	1	μA	V _{DS} =32V
I _{GSS}	Gate-to-Source forward leakage	—	—	100	nA	V _{GS} =20V
		—	—	-100		V _{GS} = -20V
Q _g	Total gate charge	—	18.8	—	nC	V _{DS} =20V
Q _{gs}	Gate-to-Source charge	—	4.7	—		V _{GS} =4.5V
Q _{gd}	Gate-to-Drain("Miller") charge	—	8.2	—		I _D =12A
t _{d(on)}	Turn-on delay time	—	14.3	—	ns	V _{GS} =10V, V _{DS} =15V, R _{GEN} =3.3Ω I _D =1A
t _r	Rise time	—	2.6	—		
t _{d(off)}	Turn-Off delay time	—	77	—		
t _f	Fall time	—	4.8	—		
C _{iss}	Input capacitance	—	2332	—	pF	V _{DS} =15V
C _{oss}	Output capacitance	—	193	—		V _{GS} =0V
C _{rss}	Reverse transfer capacitance	—	138	—		f=1MHz

Source-Drain Ratings and Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I _S	Continuous Source Current (Body Diode)	—	—	60	A	MOSFET symbol showing the integral reverse p-n junction diode.
I _{SM}	Pulsed Source Current (Body Diode)	—	—	120	A	
V _{SD}	Diode Forward Voltage	—	—	1	V	V _{GS} =0V, I _S =1A, T _J =25°C

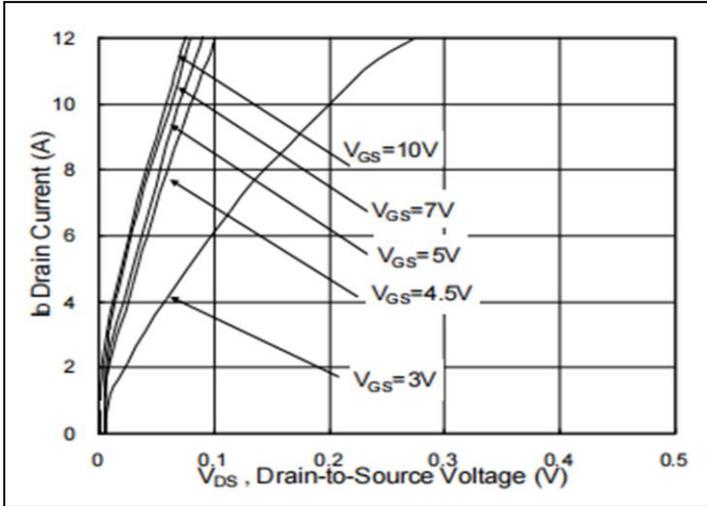
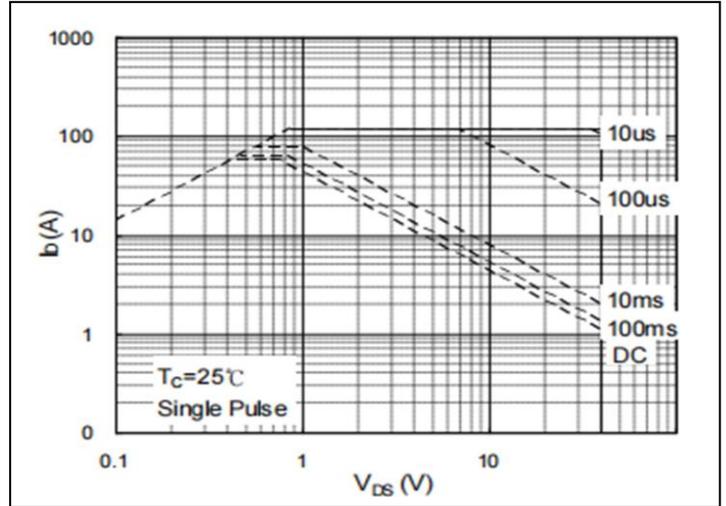
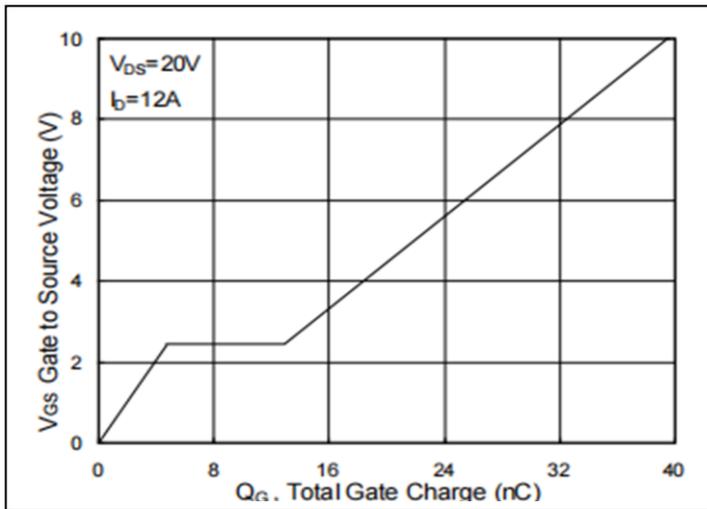
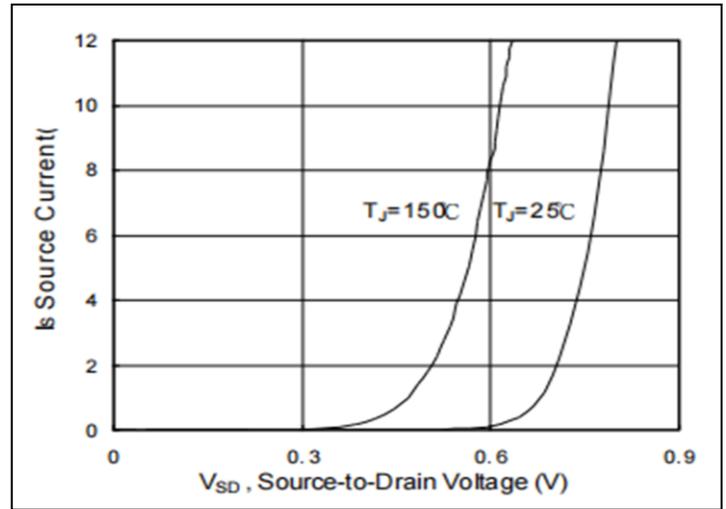
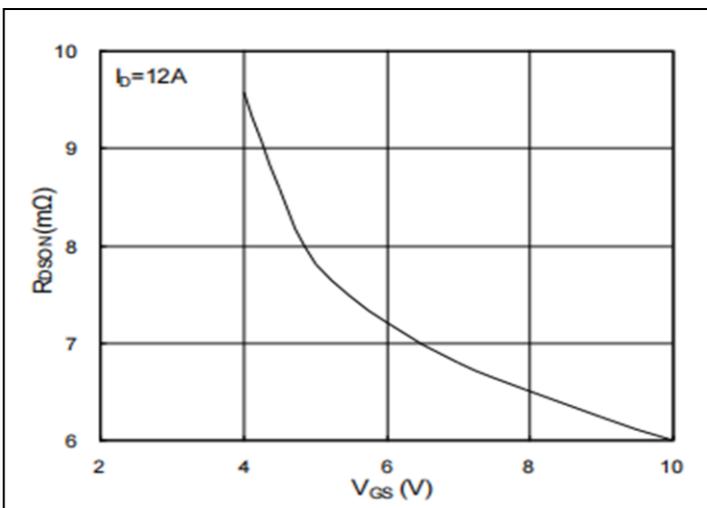
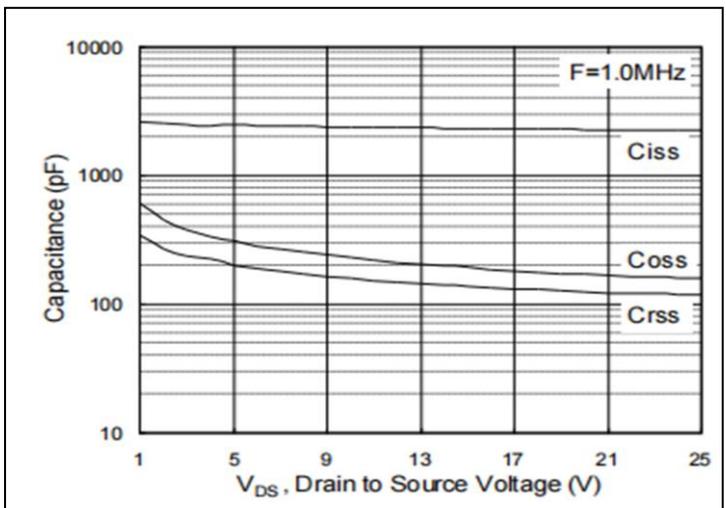


Test Circuits and Wave forms

EAS Test Circuit:

Gate Charge Test Circuit:

Switching Time Test Circuit:

Switching Wave forms:


Notes:

- ① Calculated continuous current based on maximum allowable junction temperature.
- ② Repetitive rating; pulse width limited by max. junction temperature.
- ③ The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.
- ④ The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$

Typical Electrical and Thermal Characteristics

Figure 1: Typical Output Characteristics

Figure 2: Safe Operating Area

Figure 3: Gate-Charge Characteristics

Figure 4: Body-Diode Characteristics

Figure 5: On-Resistance vs. G-S Voltage

Figure 6: Capacitance

Typical Electrical and Thermal Characteristics

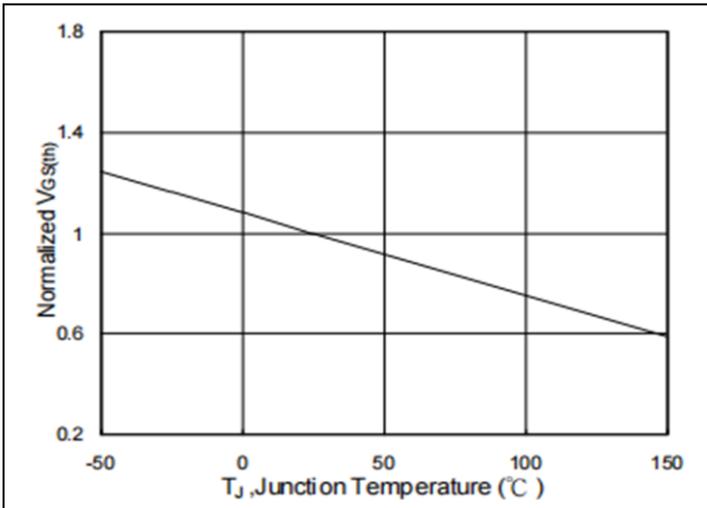


Figure 7. Normalized $V_{GS(th)}$ vs. T_J

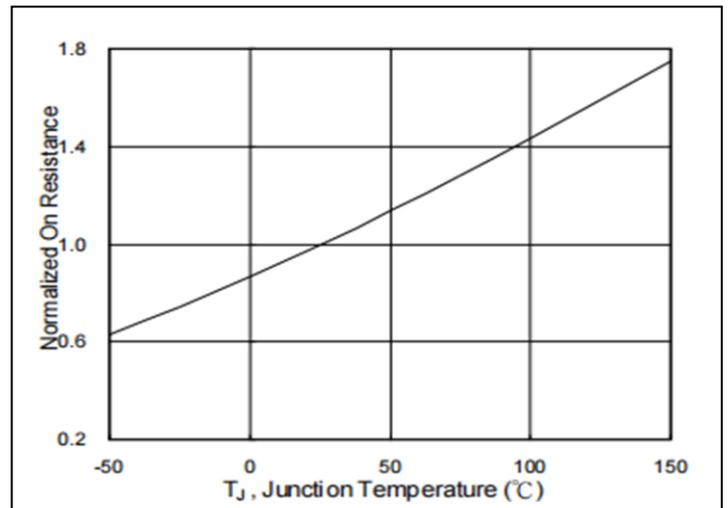


Figure 8. Normalized $R_{DS(on)}$ vs. T_J

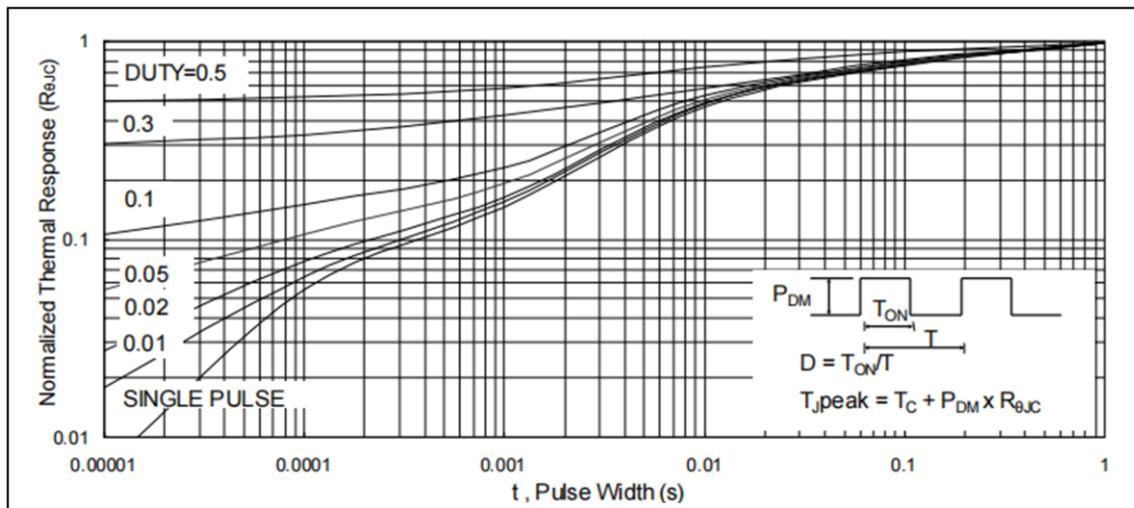
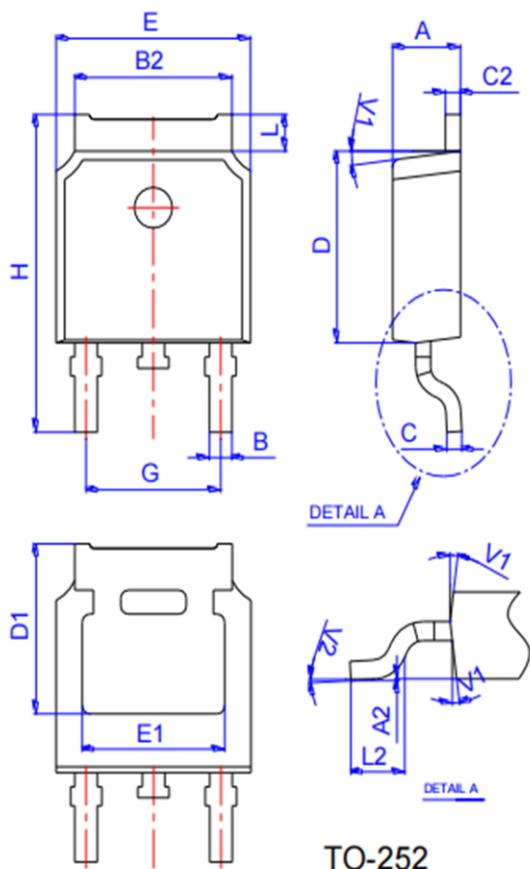


Figure 9. Normalized Maximum Transient Thermal Impedance

Mechanical Data:

TO-252 Package Outline(Unit:mm)



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

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