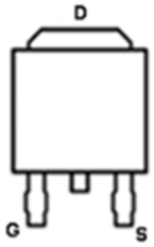
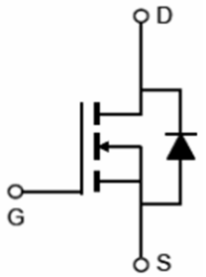
Main Product Characteristics:

V_{DSS}	40V
R_{DS}(on)	6mΩ(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℃ 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} @ 10V①	80	A
I_{DM}	Pulsed Drain Current②	120	
P_D @TC = 25°C	Power Dissipation③	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

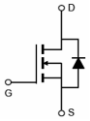
Thermal Resistance

Symbol	Characteristics	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case ③	—	2.8	℃/W
$R_{\theta JA}$	Junction-to-Ambient ④	—	62	℃/W

Electrical Characterizes @T_A=25℃unless otherwise specified

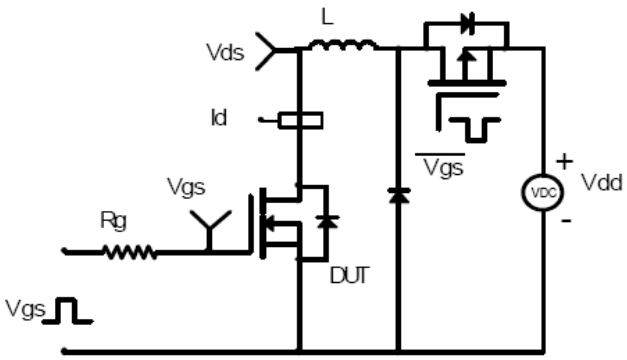
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	40	—	—	V	V_{GS} = 0V, I_D = 250μA
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	9	12	mΩ	V_{GS}=4.5V , I_D=10A
		—	6	7.5	mΩ	V_{GS}=10V , I_D=12A
$V_{GS(th)}$	Gate threshold voltage	1	—	2.5	V	V_{DS} = 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

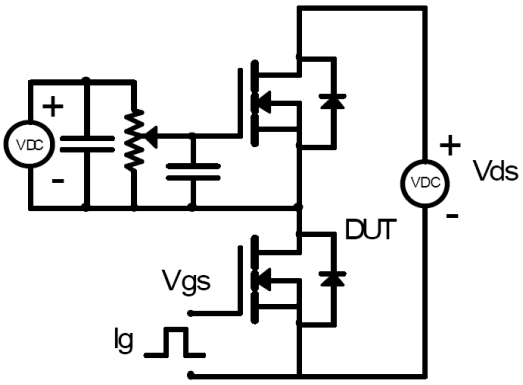
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	60	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	120	A	
V_{SD}	Diode Forward Voltage	—	—	1	V	V_{GS}=0V , I_S=1A , T_J=25℃

Test Circuits and Wave forms

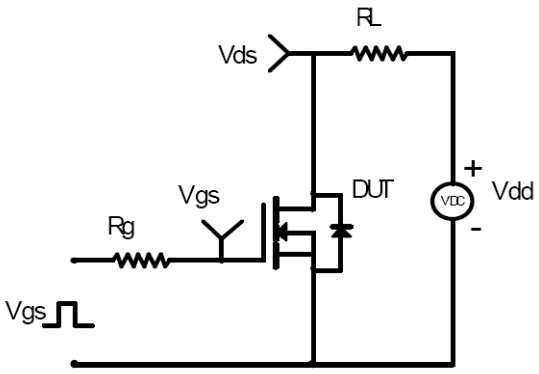
EAS Test Circuit:



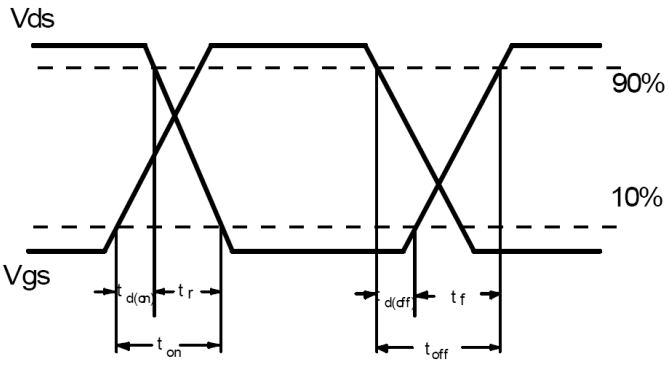
Gate Charge Test Circuit:



Switching Time Test Circuit:



Switching Wave forms:



Notes:

①Calculated continuous current based on maximum allowable junction temperature.

②Repetitive rating; pulse width limited by max. junction temperature.

③The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.

④The 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 TA =25 ℃

Typical Electrical and Thermal Characteristics

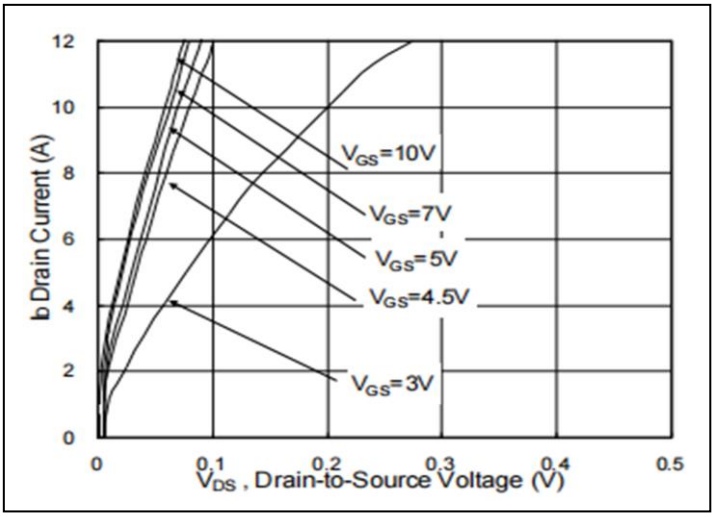


Figure 1: Typical Output Characteristics

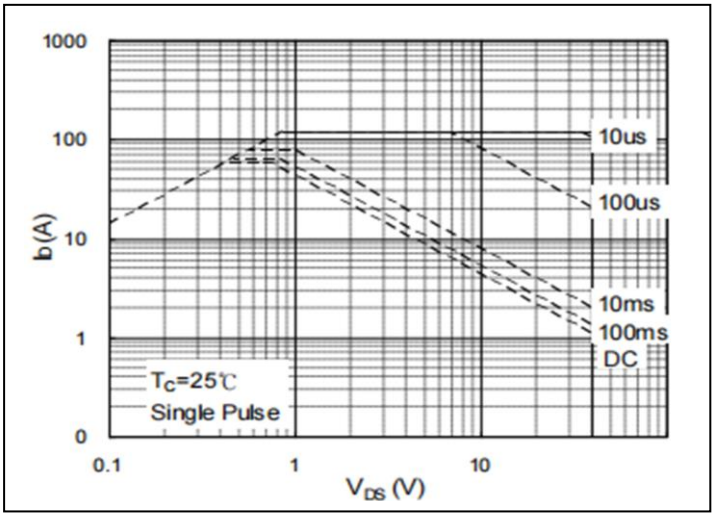


Figure 2. Safe Operating Area

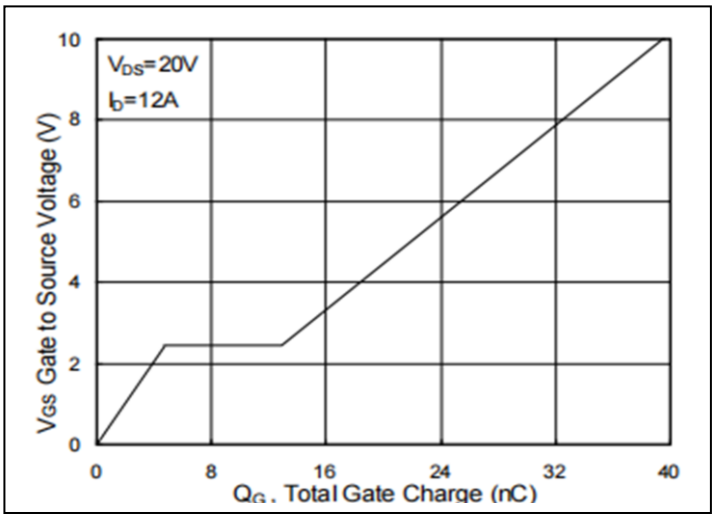


Figure 3. Gate-Charge Characteristics

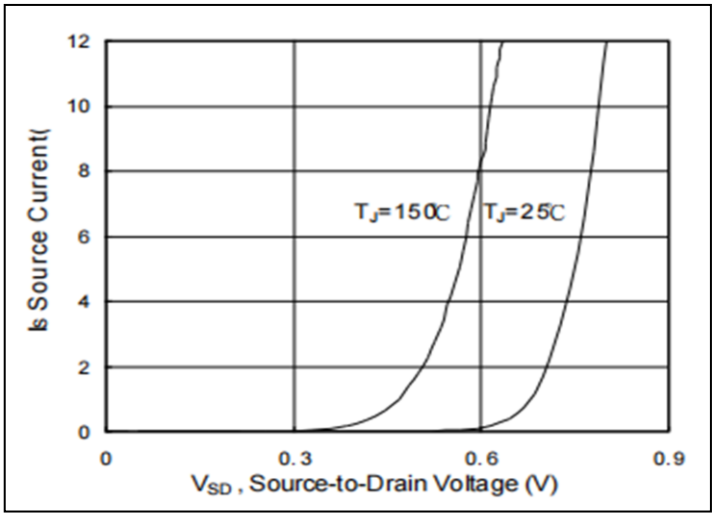


Figure 4: Body-Diode Characteristics

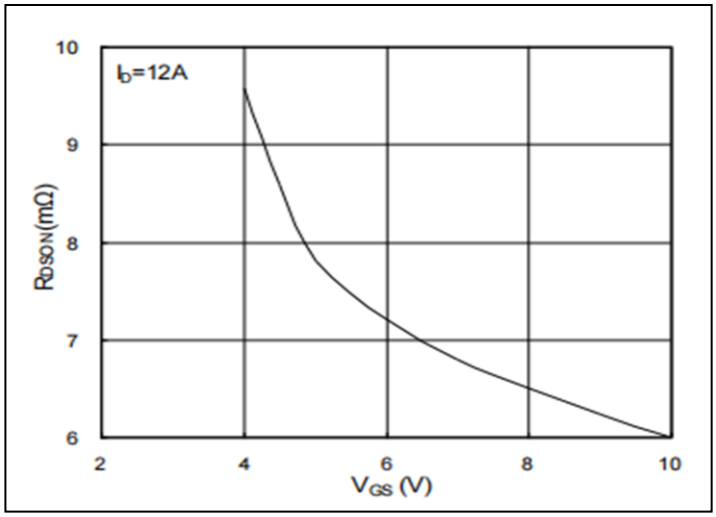


Figure 5. On-Resistance vs. G-S Voltage

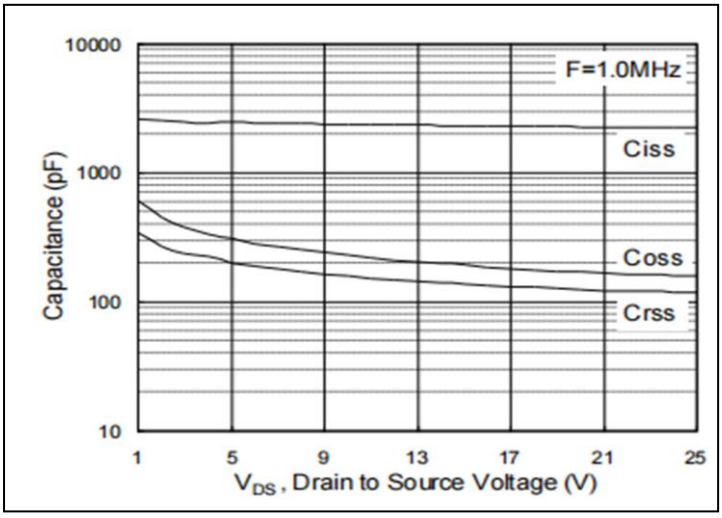


Figure 6. Capacitance

Typical Electrical and Thermal Characteristics

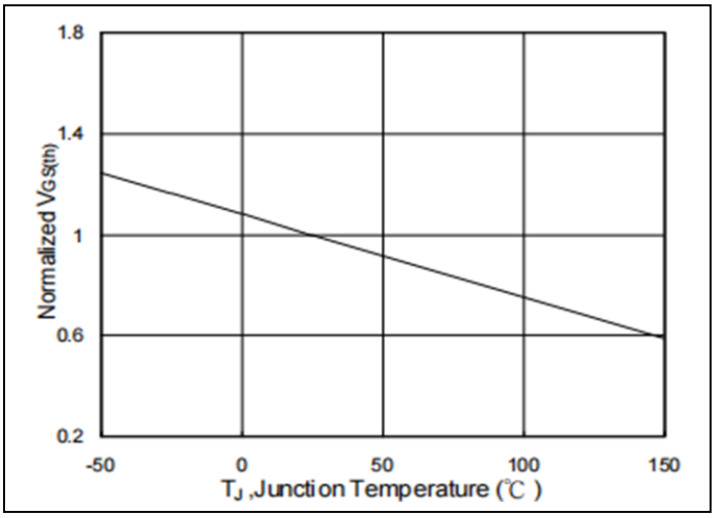


Figure 7. Normalized V_{GS}(th) vs. T_J

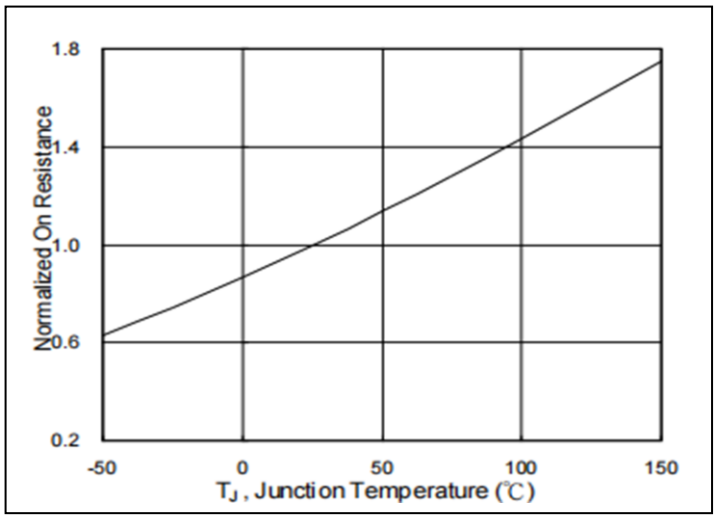


Figure 8. Normalized R_{DSON} vs. T_J

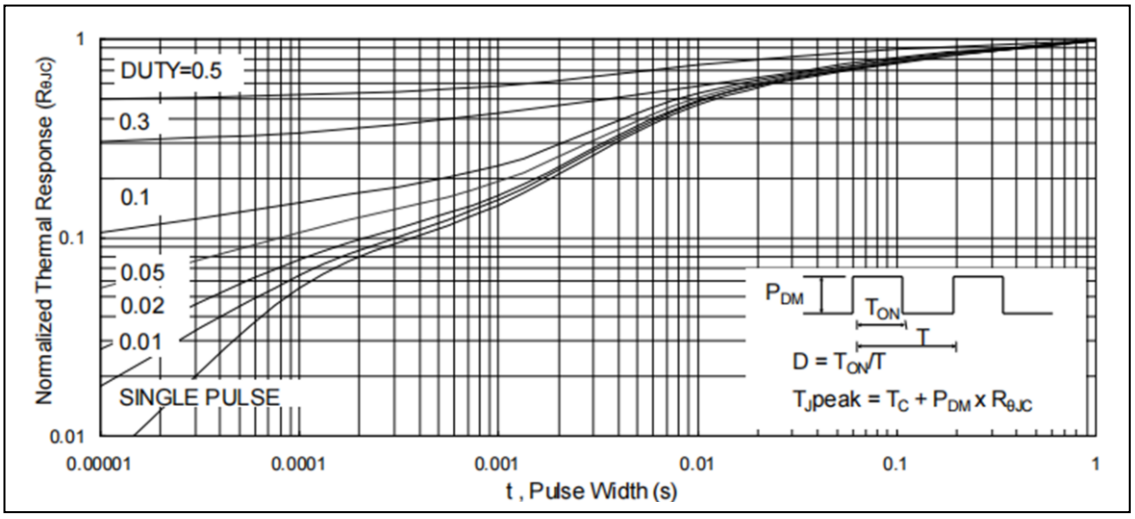
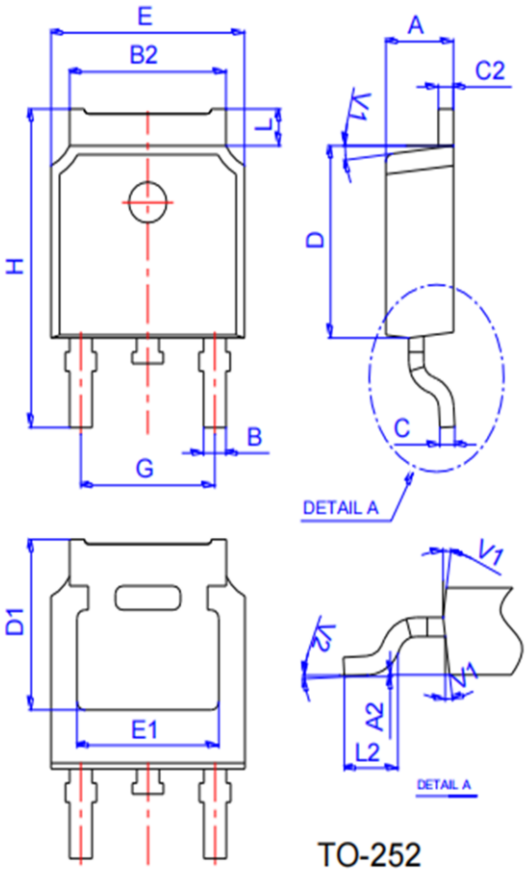


Figure 9. Normalized Maximum Transient Thermal Impedance

Mechanical Data：

TO-252 Package Outline(Unit:mm)



TO-252

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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