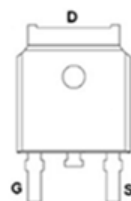
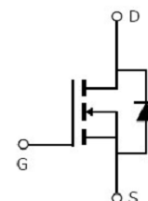


Main Product Characteristics:

V_{DSS}	30V
$R_{DS(on)}$	3.6m Ω (typ.)
I_D	100A ①


TO-252

Pin Assignment

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
$I_D @ T_C = 25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$ ①	100	A
$I_D @ T_C = 100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$ ①	58	
I_{DM}	Pulsed Drain Current ②	300	
$P_D @ T_C = 25^\circ\text{C}$	Power Dissipation ③	90	W
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy @ $L=0.6\text{mH}$	187.5	mJ
I_{AS}	Avalanche Current @ $L=0.6\text{mH}$	25	A
$T_J \quad T_{STG}$	Operating Junction and Storage Temperature Range	-55 to +150	$^\circ\text{C}$

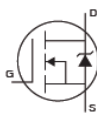
Thermal Resistance

Symbol	Characteristics	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case ③	—	1.67	$^{\circ}C/W$
$R_{\theta JA}$	Junction-to-ambient ($t \leq 10s$) ④	—	25	$^{\circ}C/W$
	Junction-to-Ambient (PCB mounted, steady-state)④	—	62	$^{\circ}C/W$

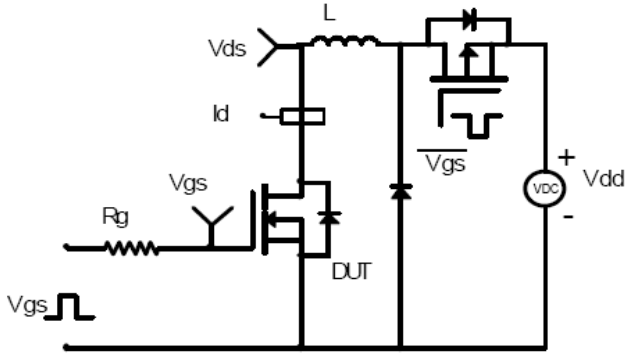
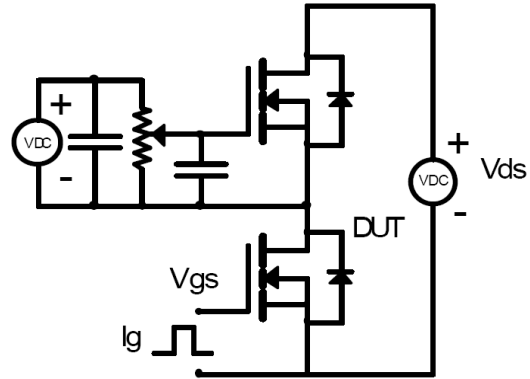
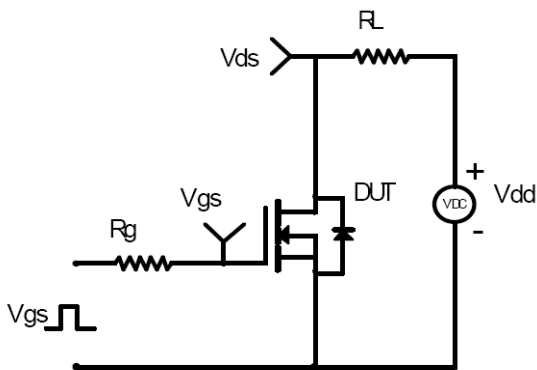
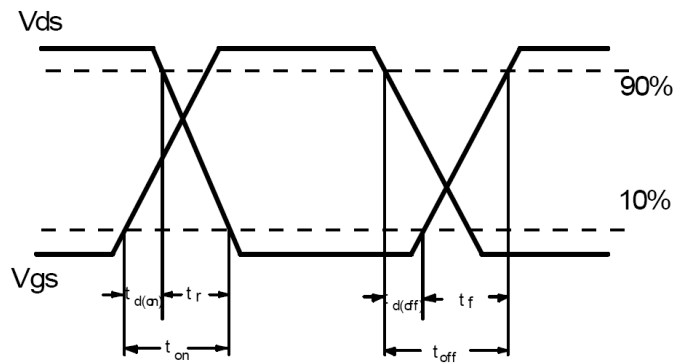
Electrical Characteristics @ $T_A=25^{\circ}C$ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	30	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	3.6	4.5	m Ω	$V_{GS}=10V, I_D = 30 A$
		—	6.5	7.6		$V_{GS}=4.5V, I_D = 15 A$
$V_{GS(th)}$	Gate threshold voltage	1.2	1.6	2.3	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
I_{DSS}	Drain-to-Source leakage current	—	—	1	μA	$V_{DS} = 24V, V_{GS} = 0V$
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	$V_{GS} = 20V$
		—	—	-100		$V_{GS} = -20V$
Q_g	Total gate charge	—	18.8	—	nC	$I_D = 15A,$ $V_{DS}=15V,$ $V_{GS} = 4.5V$
Q_{gs}	Gate-to-Source charge	—	7.5	—		
Q_{gd}	Gate-to-Drain("Miller") charge	—	6.9	—		
$t_{d(on)}$	Turn-on delay time	—	12.4	—	ns	$V_{GS}=4.5V, V_{DS} = 15V,$ $R_{GEN}=2.2\Omega, I_D = 20A$
t_r	Rise time	—	23.7	—		
$t_{d(off)}$	Turn-Off delay time	—	19.5	—		
t_f	Fall time	—	8.1	—		
C_{iss}	Input capacitance	—	2286	—	pF	$V_{GS} = 0V$
C_{oss}	Output capacitance	—	332	—		$V_{DS} = 15V$
C_{rss}	Reverse transfer capacitance	—	286	—		$f = 1MHz$

Source-Drain Ratings and Characteristics

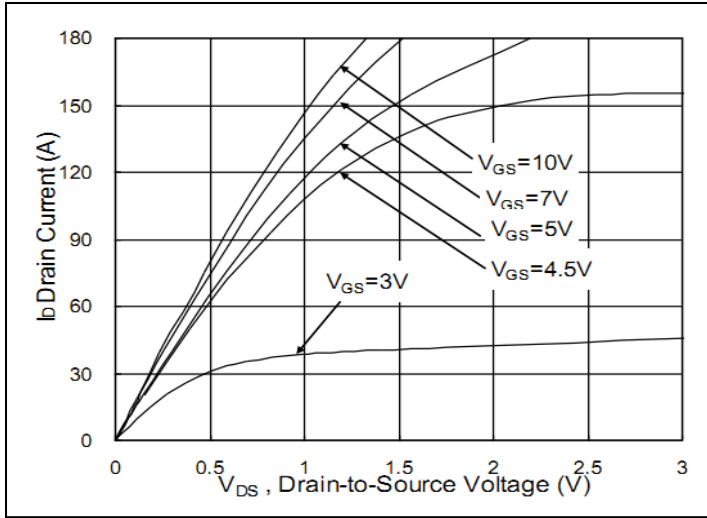
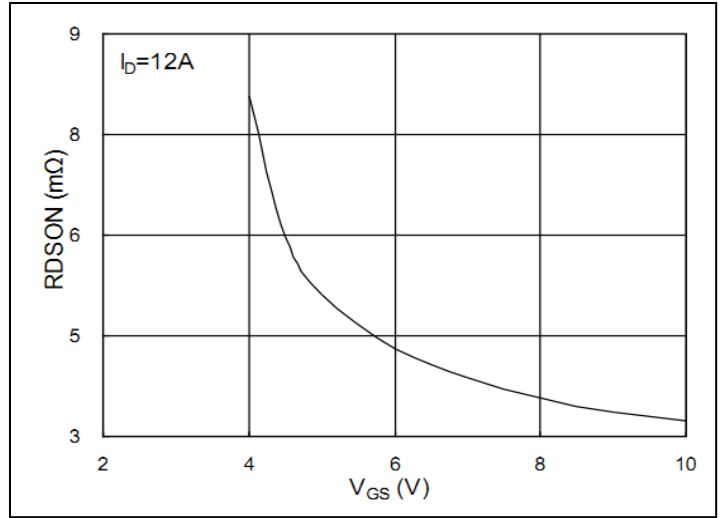
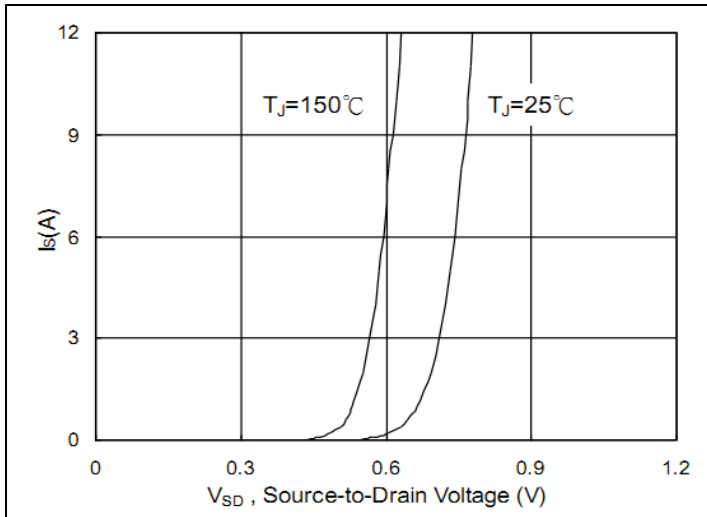
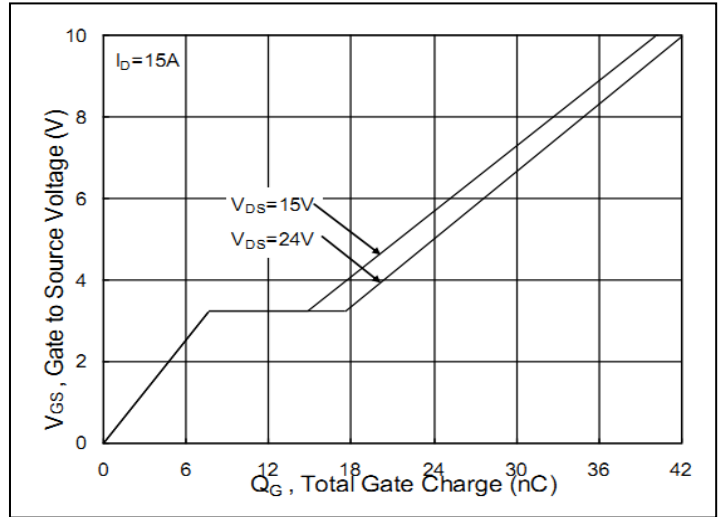
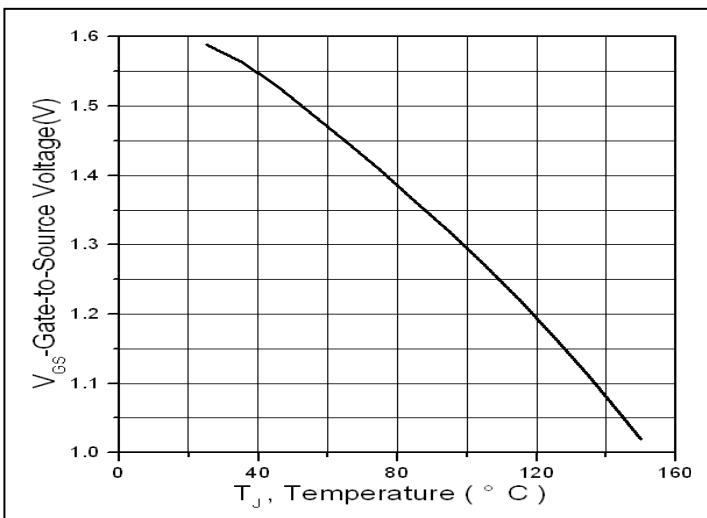
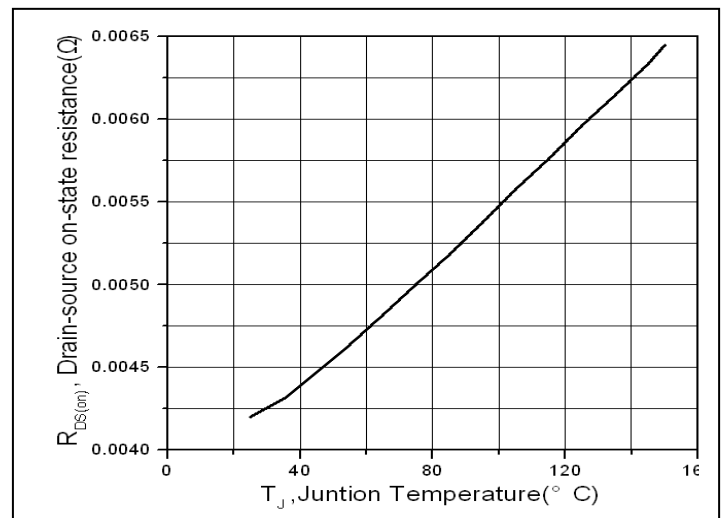
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode) ①	—	—	80	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	160	A	
V_{SD}	Diode Forward Voltage	—	—	1	V	$I_S=1A, V_{GS}=0V$
t_{rr}	Reverse Recovery Time	—	12	—	nS	$T_J = 25^{\circ}C, I_F = 30A,$
Q_{rr}	Reverse Recovery Charge	—	4	—	nC	$di/dt = 100A/\mu s$

Test Circuits and Waveforms

EAS Test Circuit:

Gate charge test circuit:

Switching Time Test Circuit:

Switching Waveforms:


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 1in 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. Rdson vs. G-S Voltage

Figure 3. Forward Characteristics Of Reverse

Figure 4. Gate Charge

Figure 5. Normalized $V_{GS(th)}$ vs. Junction Temperature

Figure 6. Normalized On-Resistance vs. Junction Temperature

Typical Electrical and Thermal Characteristics

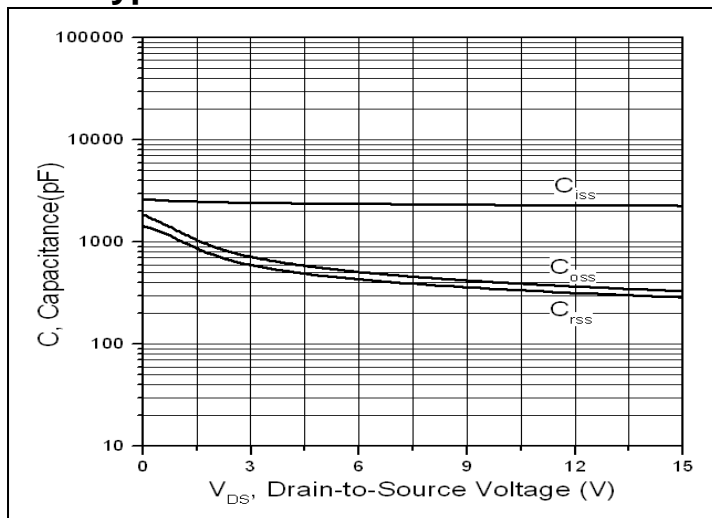


Figure7. Capacitance

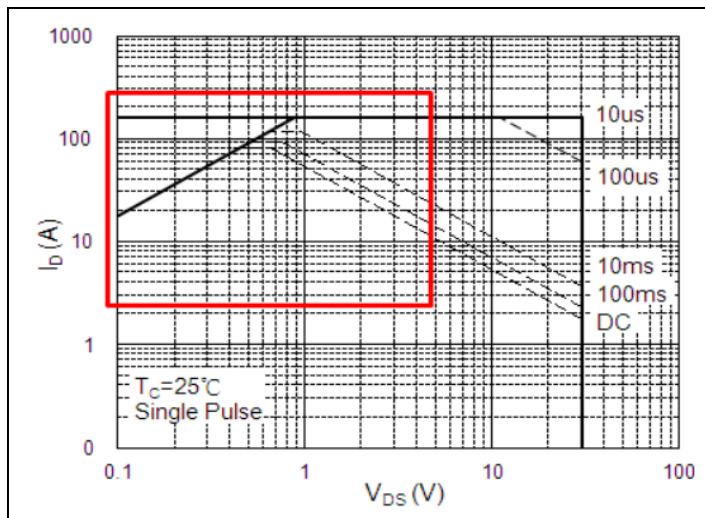


Figure8. Safe Operation Area

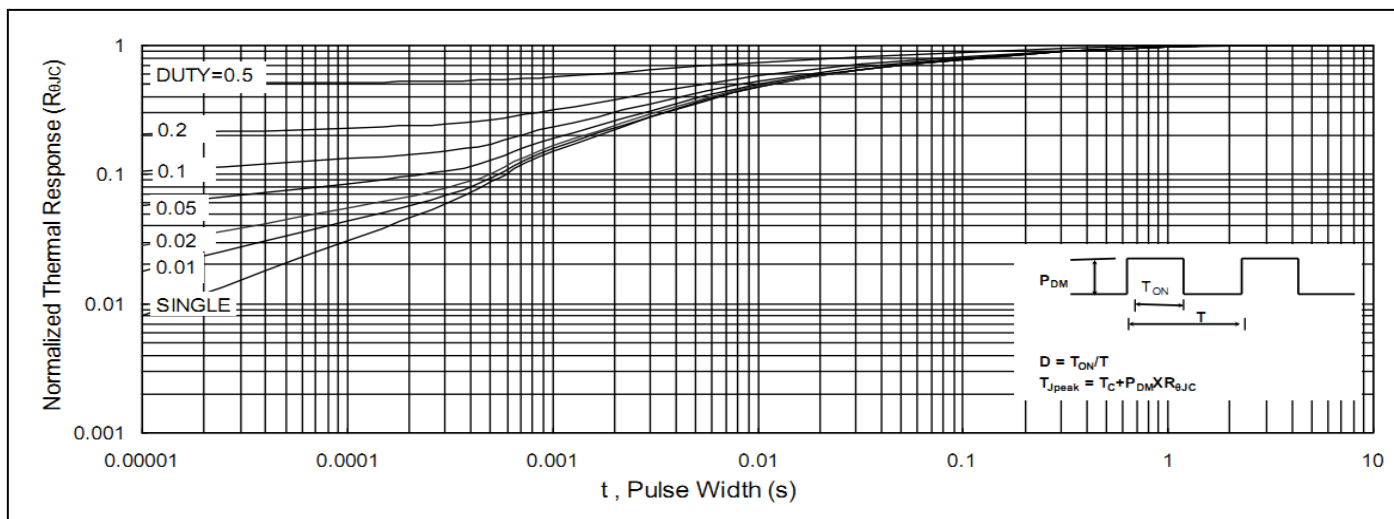
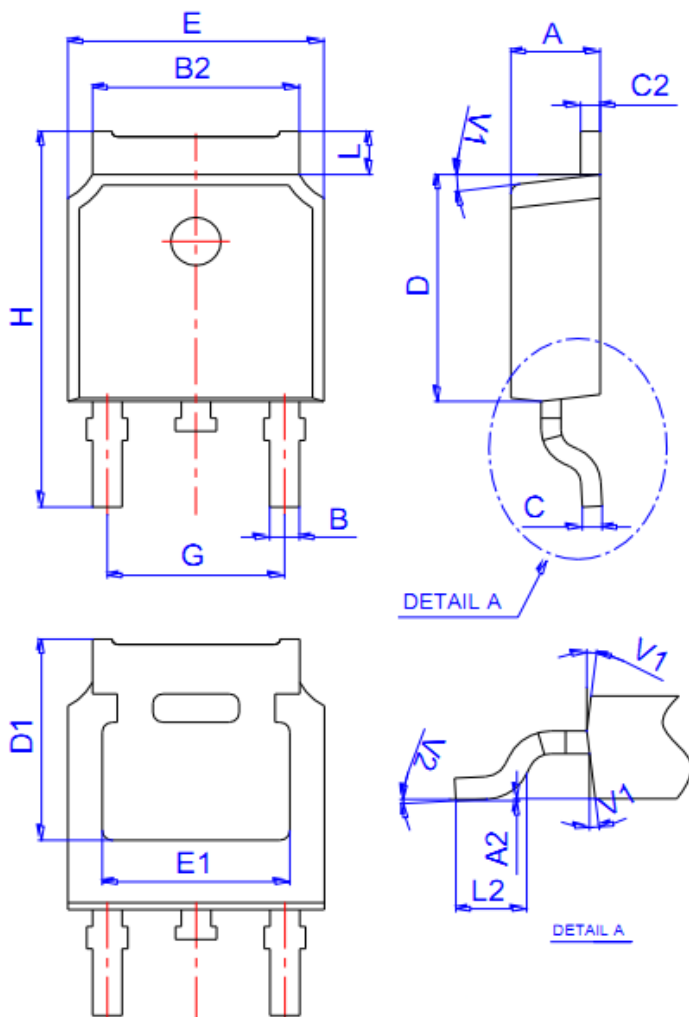


Figure9. Transient Thermal Impedance

Mechanical Data


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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