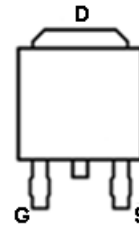
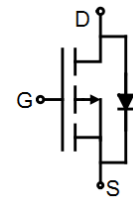


Main Product Characteristics

V_{DSS}	-40V
$R_{DS(on)}$	10.5m Ω (typ.)
I_D	-30A


TO-252

Pin Assignment

Schematic Diagram

Features and Benefits

- Advanced trench 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 trench 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	-30	A
$I_D @ T_C = 100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ -10\text{V}$ ①	-28	
I_{DM}	Pulsed Drain Current ②	-105	
$P_D @ T_C = 25^\circ\text{C}$	Power Dissipation ③	75	W
V_{DS}	Drain-Source Voltage	-40	V
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy @ $L=0.1\text{mH}$	146	mJ
I_{AS}	Avalanche Current @ $L=0.1\text{mH}$	-54	A
$T_J \quad T_{STG}$	Operating Junction and Storage Temperature Range	-55 to + 150	$^\circ\text{C}$

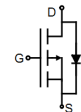
Thermal Resistance

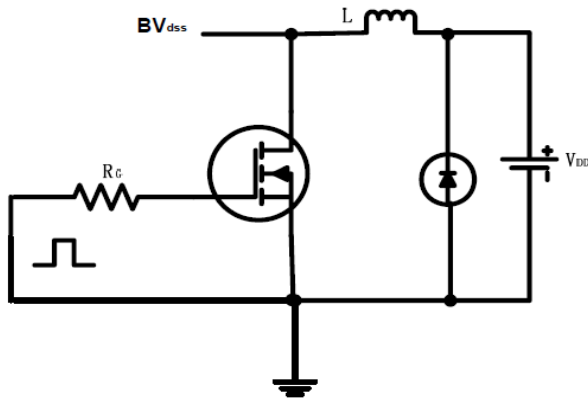
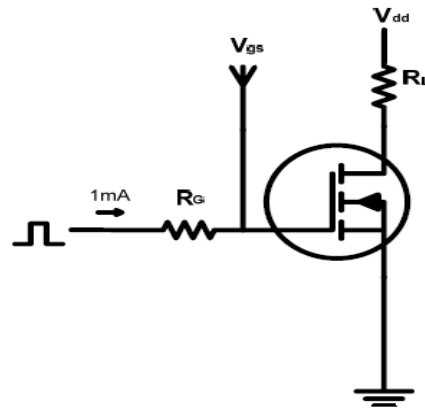
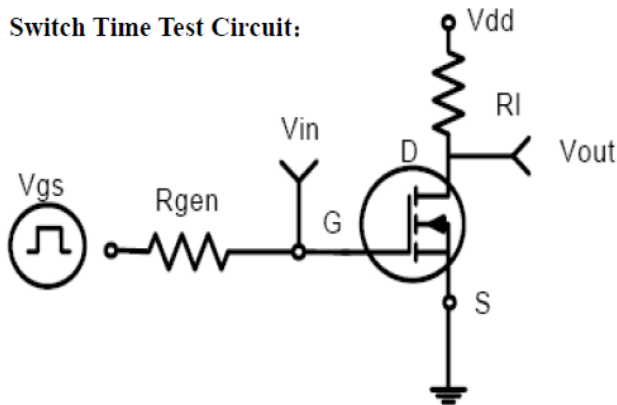
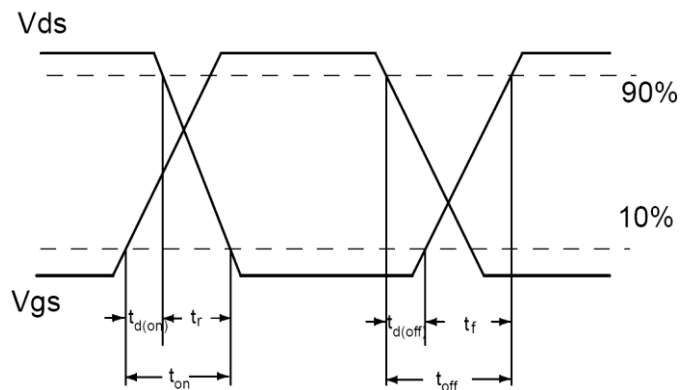
Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case ③	—	2.4	$^{\circ}C/W$
$R_{\theta JA}$	Junction-to-ambient ($t \leq 10s$) ④	—	62	$^{\circ}C/W$

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

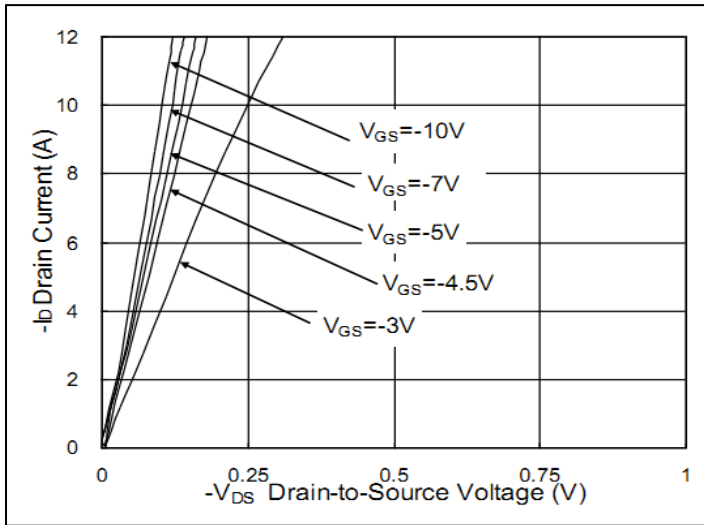
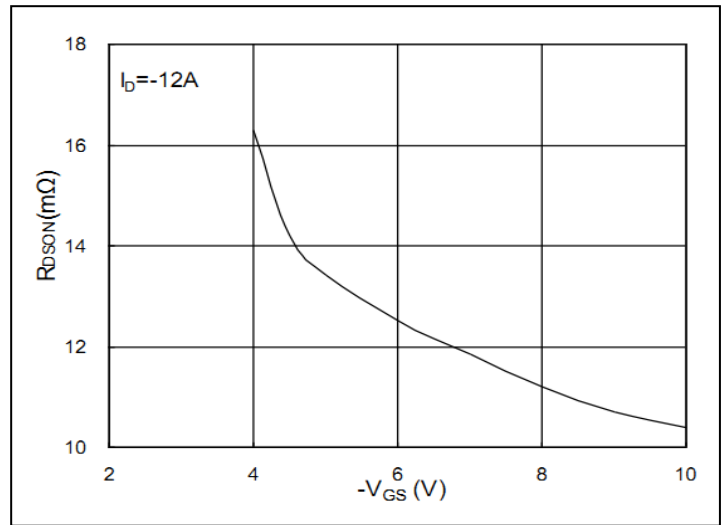
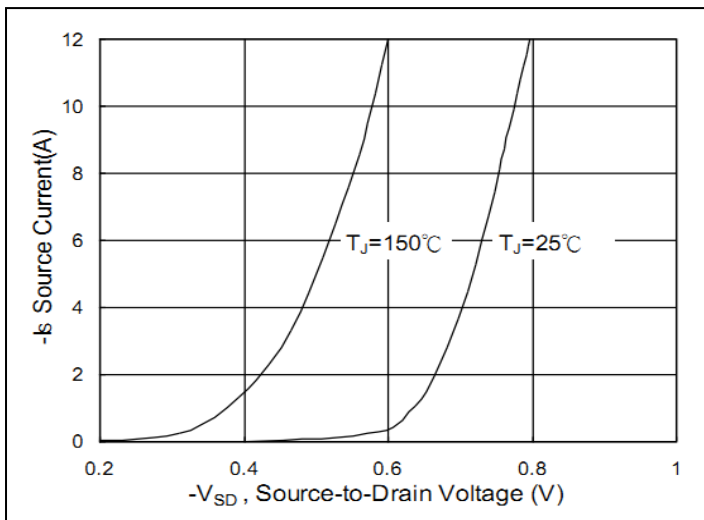
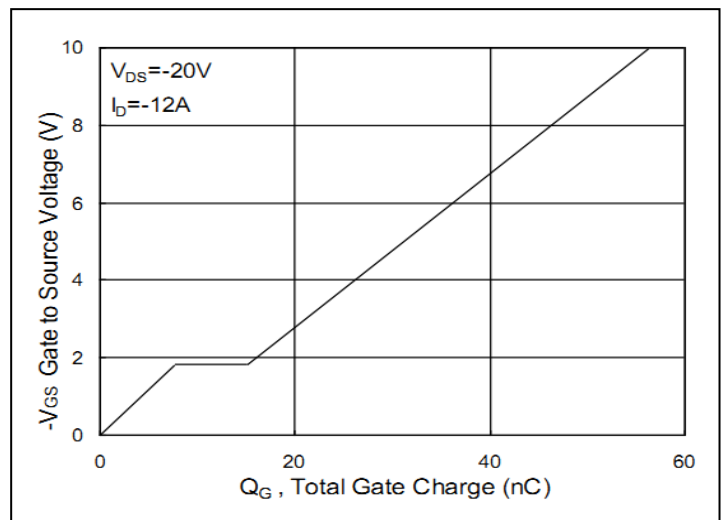
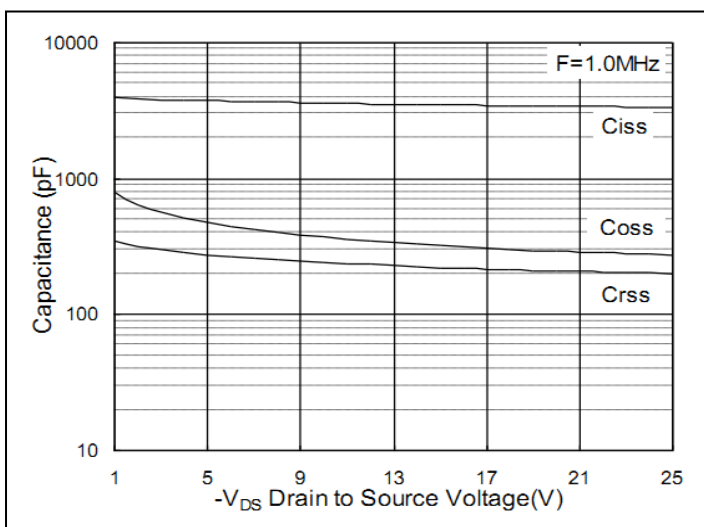
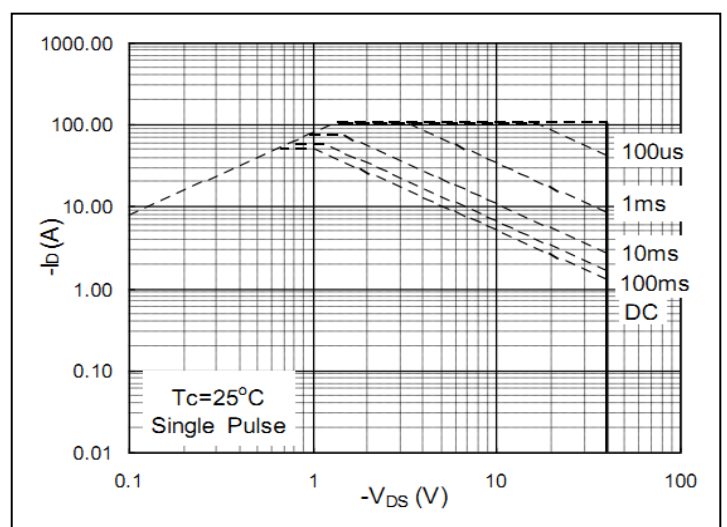
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	-40	—	—	V	$V_{GS} = 0V, I_D = -250\mu A$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	10.5	13	m Ω	$V_{GS} = -10V, I_D = -18A$
		—	15	20		$V_{GS} = -4.5V, I_D = -12A$
$V_{GS(th)}$	Gate threshold voltage	-1	-1.6	-2.5	V	$V_{DS} = V_{GS}, I_D = -250\mu A$
I_{DSS}	Drain-to-Source leakage current	—	—	1	μA	$V_{DS} = -32V, V_{GS} = 0V$
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	$V_{GS} = 20V$
		—	—	-100		$V_{GS} = -20V$
Q_g	Total gate charge	—	27.5	—	nC	$I_D = -12A,$
Q_{gs}	Gate-to-Source charge	—	7.5	—		$V_{DS} = -20V,$
Q_{gd}	Gate-to-Drain("Miller") charge	—	7.3	—		$V_{GS} = -4.5V$
$t_{d(on)}$	Turn-on delay time	—	40	—	ns	$V_{GS} = -10V, V_{DS} = -15V,$ $I_D = -1A$ $R_{GEN} = 3.3\Omega$
t_r	Rise time	—	35	—		
$t_{d(off)}$	Turn-Off delay time	—	100	—		
t_f	Fall time	—	10	—		
C_{iss}	Input capacitance	—	3500	—	pF	$V_{GS} = 0V$
C_{oss}	Output capacitance	—	320	—		$V_{DS} = -15V$
C_{riss}	Reverse transfer capacitance	—	220	—		$f = 1MHz$

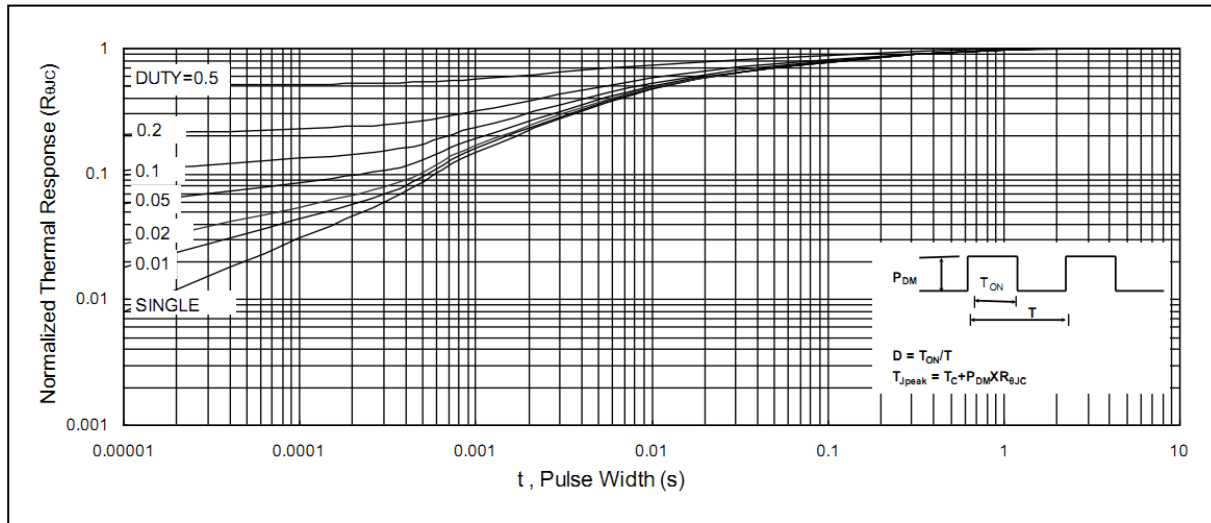
Source-Drain Ratings and Characteristics

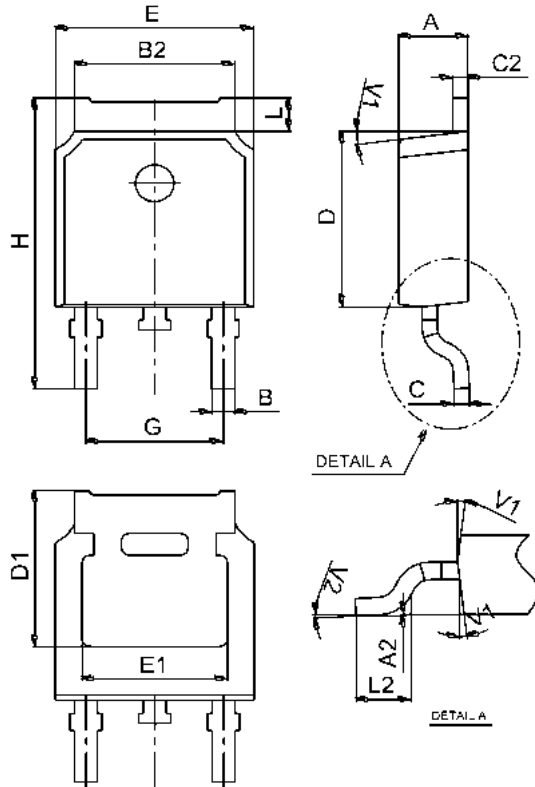
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	-52	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	-105	A	
V_{SD}	Diode Forward Voltage	—	—	-1	V	$I_S = -1A, V_{GS} = 0V$

Test Circuits and Waveforms
EAS test circuits:

Gate charge test circuit:

Switch Time Test Circuit:

Switch Waveforms:

Notes

- ① The maximum current rating is limited by bond-wires.
- 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 $T_A = 25^\circ C$

Typical Electrical and Thermal Characteristics

Figure1. Typical Output Characteristics

Figure2. On-Resistance vs. Gate-Source Voltage

Figure3. Forward Characteristics Of Reverse

Figure4. Transfer Characteristics

Figure5. Capacitance

Figure6. Safe Operating Area

Typical Electrical and Thermal Characteristics

Figure7. Maximum Effective Transient Thermal Impedance

Mechanical Data
TO-252 Outline Package


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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