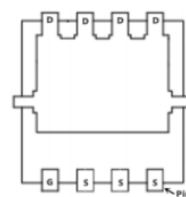
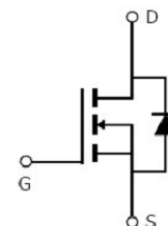


Main Product Characteristics

V_{DSS}	40V
$R_{DS(on)}$	1.4m Ω (typ.)
I_D	120A ①


DFN 5*6-8L

Pin Assignment

Schematic Diagram

Features and Benefits

- Advanced 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	120	A
I_D @ TC = 100°C	Continuous Drain Current, V_{GS} @ 10V ①	82	
I_{DM}	Pulsed Drain Current ②	400	
P_D @TC = 25°C	Power Dissipation ③	125	W
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy @ L=0.5mH	400	mJ
I_{AS}	Avalanche Current @L=0.5mH	40	A
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +150	°C

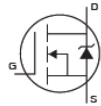
Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case ③	—	1	$^{\circ}C/W$
$R_{\theta JA}$	Junction-to-ambient ($t \leq 10s$) ④	—	50	$^{\circ}C/W$

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	—	1.4	1.8	m Ω	$V_{GS}=10V, I_D=20A$
		—	2	2.6		$V_{GS}=4.5V, I_D=20A$
$V_{GS(th)}$	Gate threshold voltage	1	—	2.2	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 (4.5V)	—	42	—	nC	$I_D = 20A,$ $V_{DS}=15V,$ $V_{GS} = 10V$
Q_{gs}	Gate-to-Source charge	—	10	—		
Q_{gd}	Gate-to-Drain("Miller") charge	—	15	—		
$t_{d(on)}$	Turn-on delay time	—	18	—	nS	$V_{GS}=10V, V_{DD} = 15V,$ $R_{GEN}=3.3\Omega$ $I_D = 20A$
t_r	Rise time	—	8	—		
$t_{d(off)}$	Turn-Off delay time	—	58	—		
t_f	Fall time	—	30	—		
C_{iss}	Input capacitance	—	3950	—	pF	$V_{GS} = 0V$ $V_{DS} = 20V$ $f = 1MHz$
C_{oss}	Output capacitance	—	1110	—		
C_{riss}	Reverse transfer capacitance	—	80	—		

Source-Drain Ratings and Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode) ①	—	—	100	A	MOSFET symbol showing the integral reverse p-n junction diode. 
V_{SD}	Diode Forward Voltage	—	—	1.2	V	$I_S=1A, V_{GS}=0V, T_J = 25^{\circ}C$

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 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

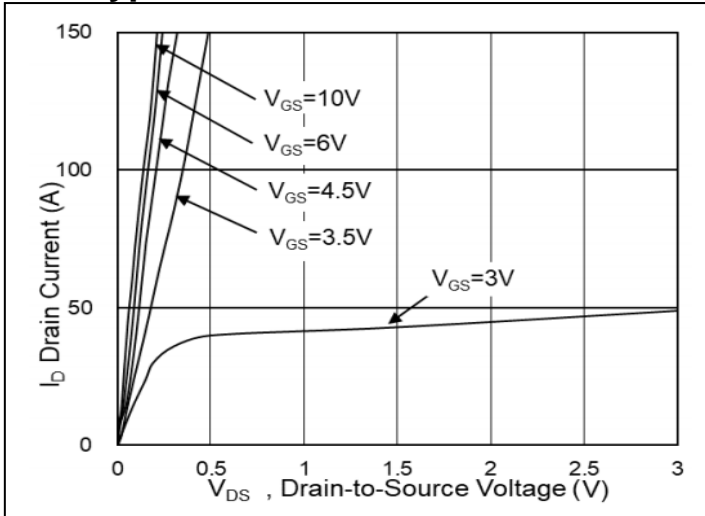


Figure 1: Typical Output Characteristics

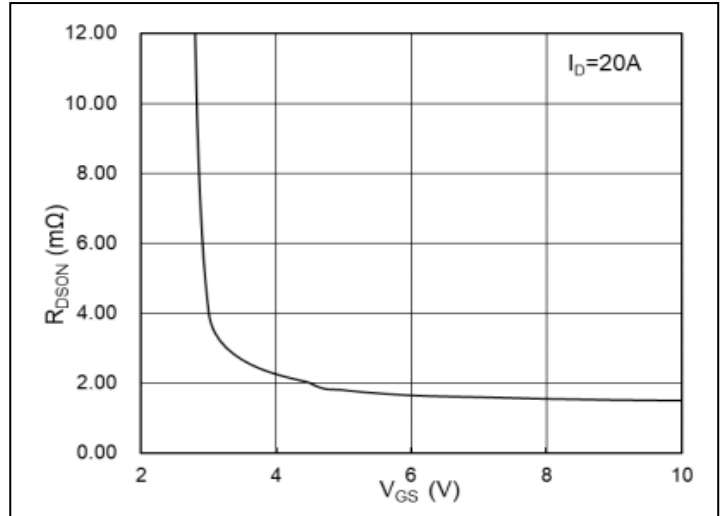


Figure 2: On-Resistance vs. G-S Voltage

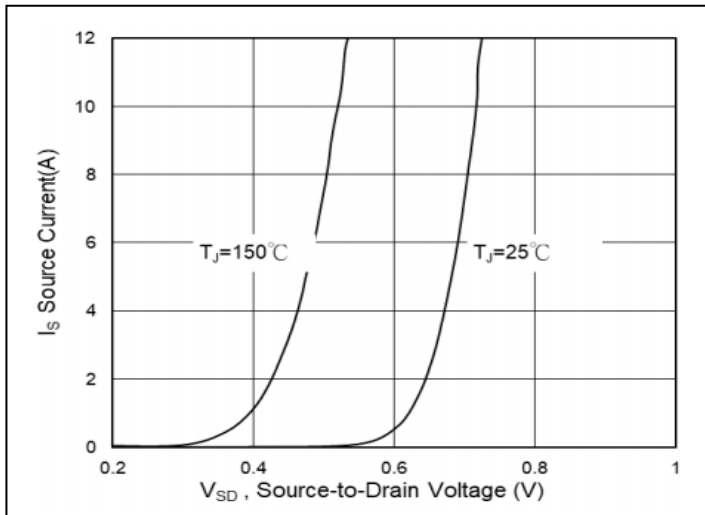


Figure 3: Source Drain Forward Characteristics

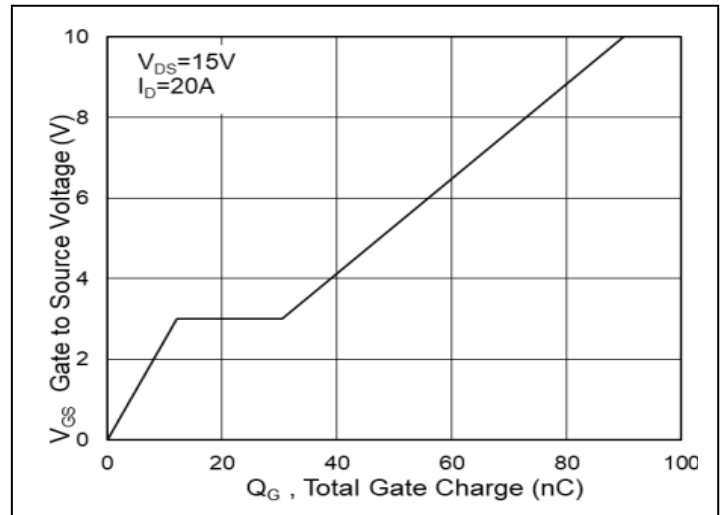


Figure 4: Gate Charge Characteristics

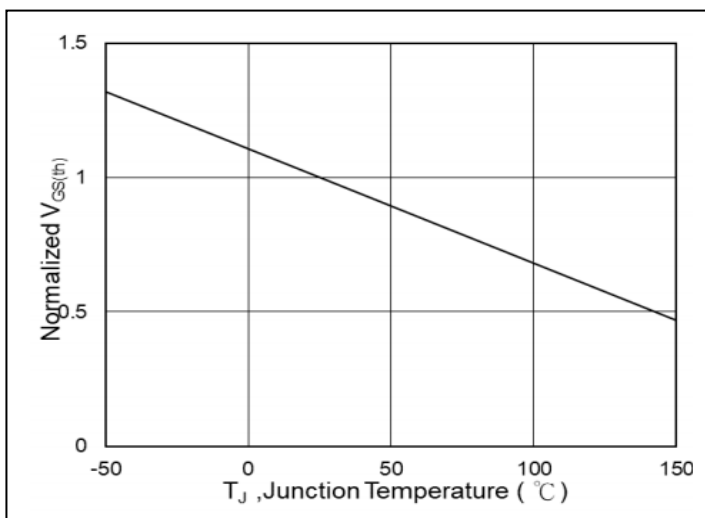


Figure 5: Normalized $V_{GS(th)}$ vs. Junction Temperature

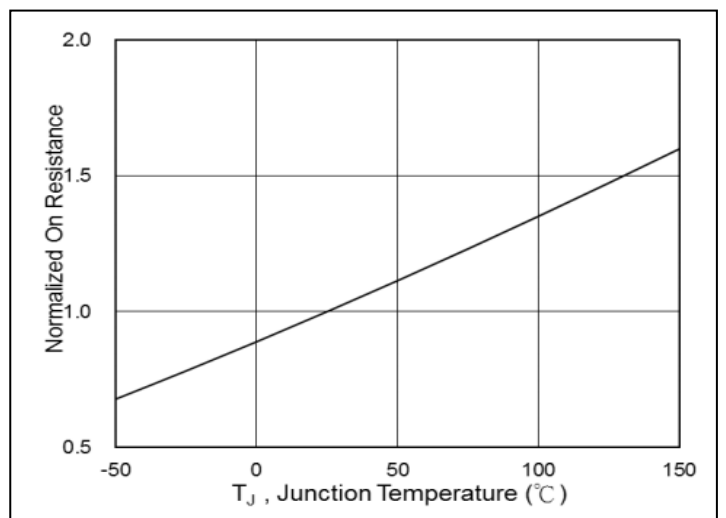


Figure 6: Normalized On-Resistance vs. Junction Temperature

Typical electrical and thermal characteristics

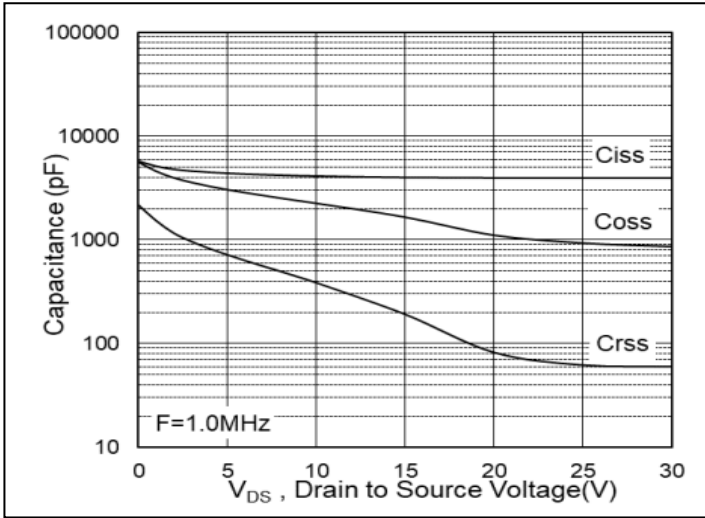


Figure 7: Capacitance

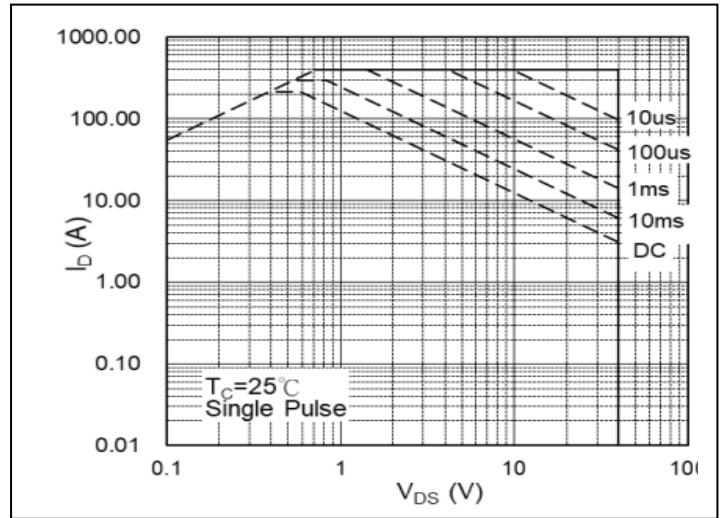


Figure 8: Safe Operation Area

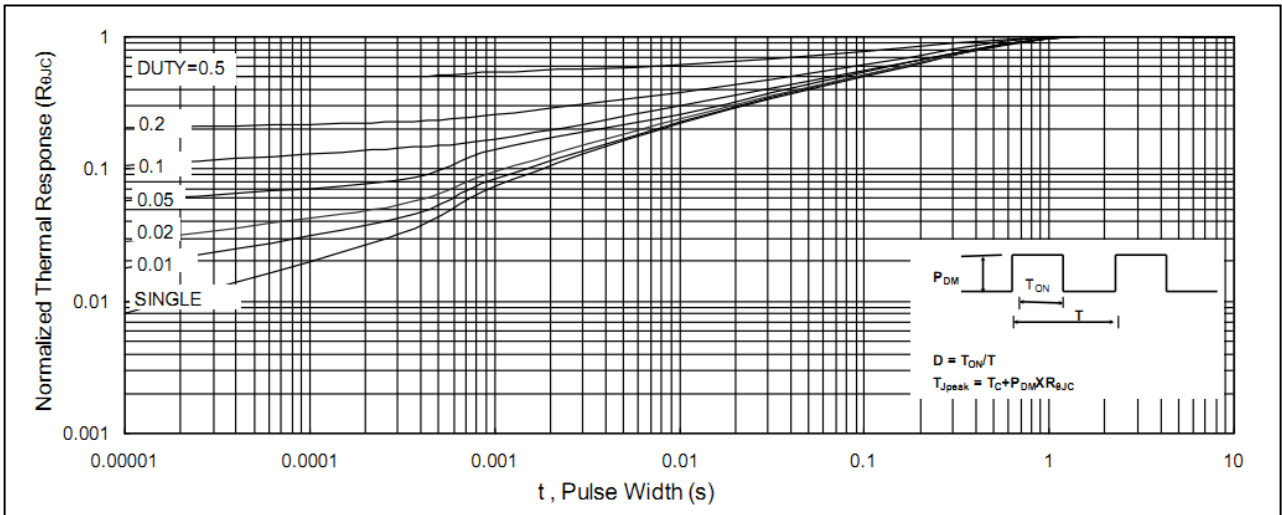
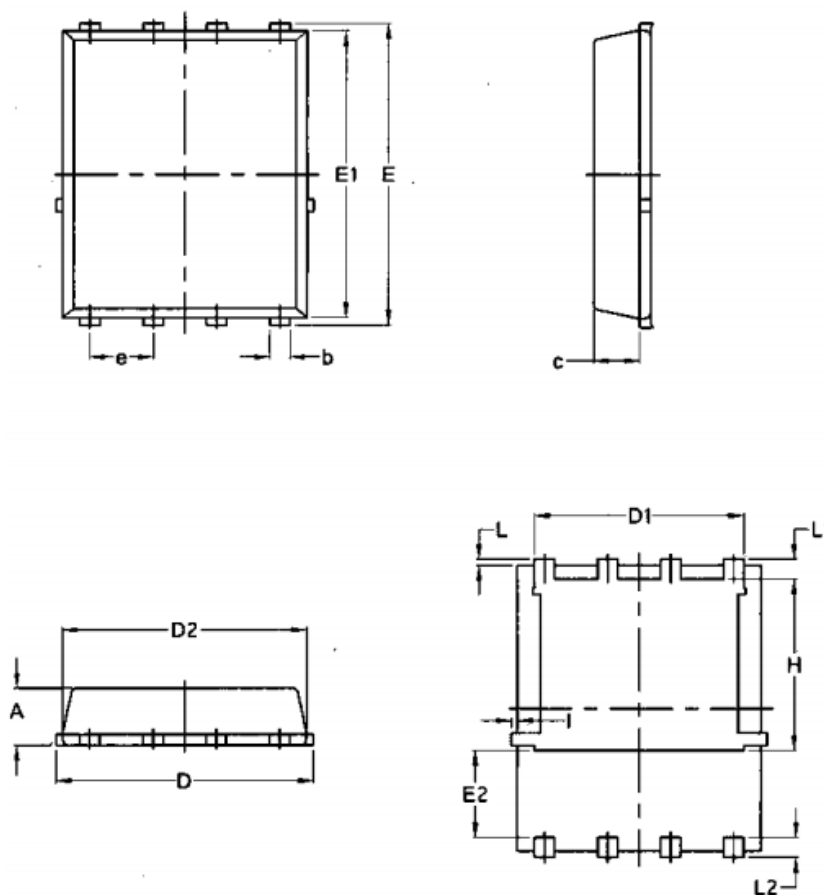


Figure 9: Transient Thermal Impedance

Mechanical Data:



Symbol	Common			
	mm		Inch	
	Mim	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070

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