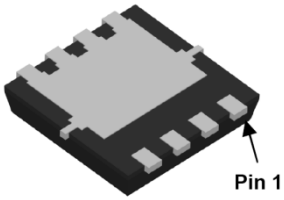
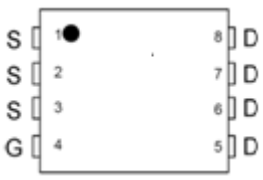
Main Product Characteristics:

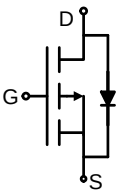
V_{DSS}	-20V
R_{DS}(on)	3.6mΩ (typ.)
I_D	-50A



DFN3.3x3.3
Bottom view



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℃ 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 @ TC = 25℃	Continuous Drain Current, V_{GS} @ 10V ①	-50	A
I_{DM}	Pulsed Drain Current ②	-200	
P_D @TC = 25℃	Power Dissipation ③	83	W
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy @ L=0.1mH ②	80	mJ
I_{AR}	Avalanche Current @ L=0.1mH ②	40	A
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to + 150	℃

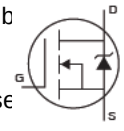
Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case ③	—	1.5	℃/W
$R_{\theta JA}$	Junction-to-ambient (t ≤ 10s) ④	—	20	℃/W

Electrical Characterizes @T_A=25℃ unless otherwise specified

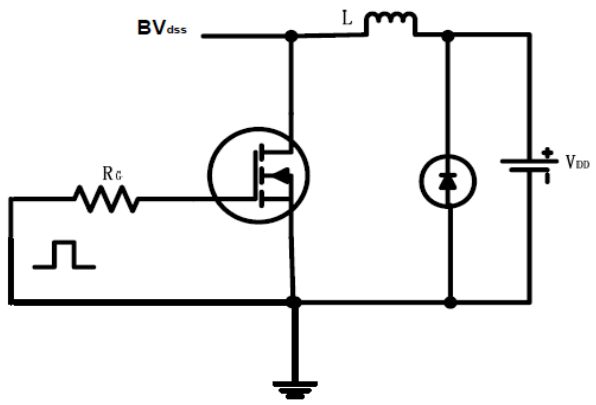
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	-20	—	—	V	V_{GS} = 0V, I_D = -250μA
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	3.6	5	mΩ	V_{GS}=-4.5V,I_D =-20A
		—	4.7	6.5		V_{GS}=-2.5V,I_D =-20A
		—	6.4	8.5		V_{GS}=-1.8V,I_D =-20A
$V_{GS(th)}$	Gate threshold voltage	-0.35	—	-1	V	V_{DS} =V_{GS}, I_D=-250μA
I_{DSS}	Drain-to-Source leakage current	—	—	-1	μA	V_{DS} = -16V,V_{GS} = 0V
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	V_{GS} =12V
		—	—	-100		V_{GS} = -12V
Q_g	Total gate charge	—	75	—	nC	I_D = -20A,
Q_{gs}	Gate-to-Source charge	—	10	—		V_{DS}=-15V,
Q_{gd}	Gate-to-Drain("Miller") charge	—	14	—		V_{GS} = -10V
$t_{d(on)}$	Turn-on delay time	—	12	—	ns	V_{GS}=-10V, VDS=-15V, I_D = -20A ,R_{GEN}=3Ω
t_r	Rise time	—	11	—		
$t_{d(off)}$	Turn-Off delay time	—	55	—		
t_f	Fall time	—	15	—		
C_{iss}	Input capacitance	—	4300	—	pF	V_{GS} = 0V
C_{oss}	Output capacitance	—	500	—		V_{DS} = -10V
C_{rss}	Reverse transfer capacitance	—	320	—		f = 1MHz

Source-Drain Ratings and Characteristics

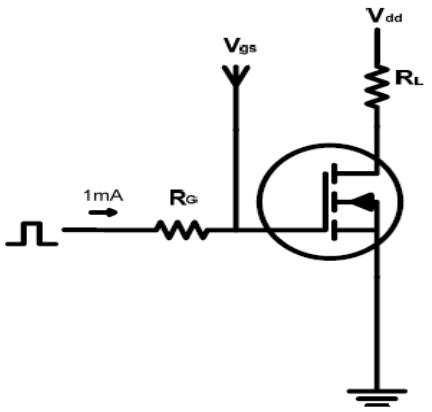
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	-50	A	MOSFET symb showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	-200	A	
V_{sd}	Diode Forward Voltage	—	—	-1.2	V	I_S=-1A, V_{GS}=0V
t_{rr}	Reverse Recovery Time	—	55	—	ns	T_J = 25℃, I_F =-20A, di/dt = 100A/μs
Q_{rr}	Reverse Recovery Charge	—	365	—	nC	

Test circuits and Waveforms

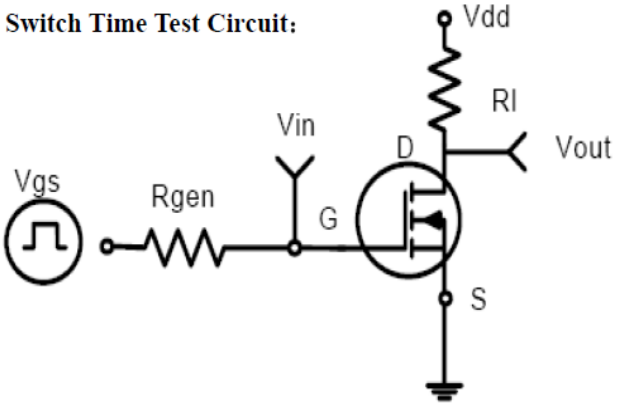
EAS test circuits:



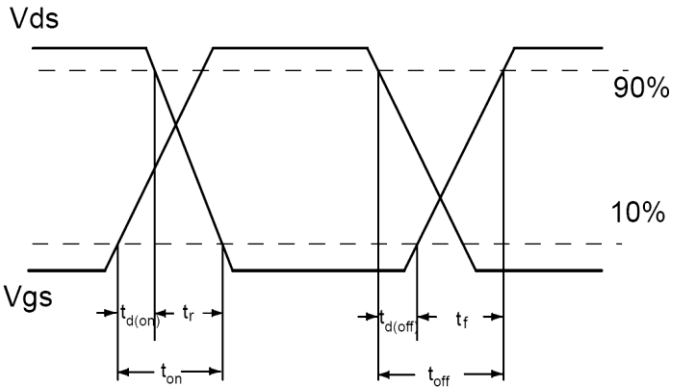
Gate charge test circuit:



Switch Time Test Circuit:



Switch Waveforms:



Notes:

①The maximum current rating is limited by bond-wires.

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 1in 2 FR-4 board with 2oz. Copper, in a still air environment with TA =25℃

Typical electrical and thermal characteristics

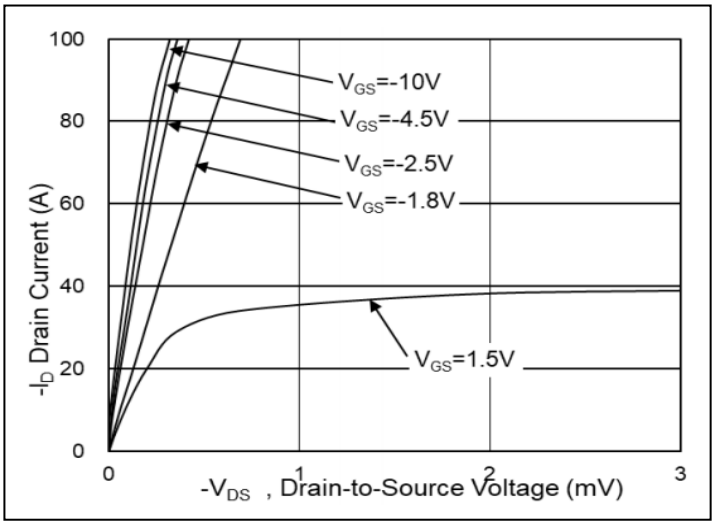


Figure 1. Typical Output Characteristics

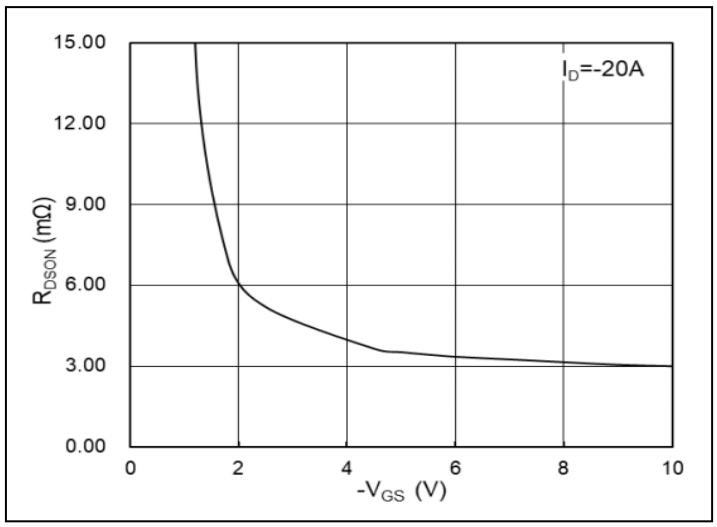


Figure 2.On-resistance Vs. G-S Voltage

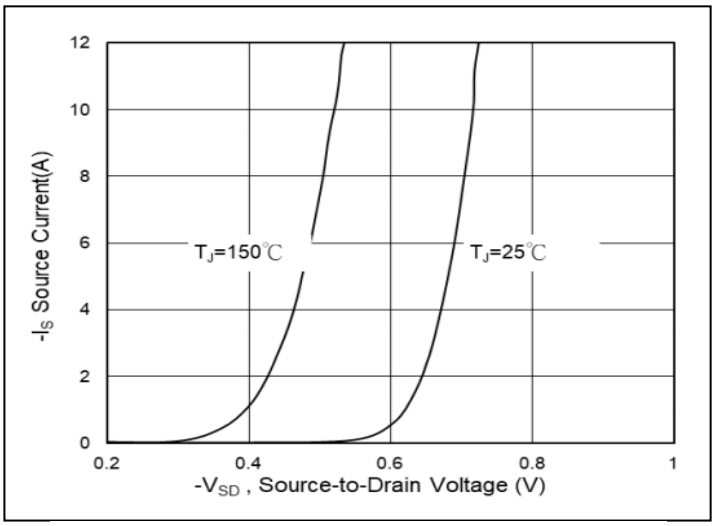


Figure 3. Source Darin Forward Characteristics

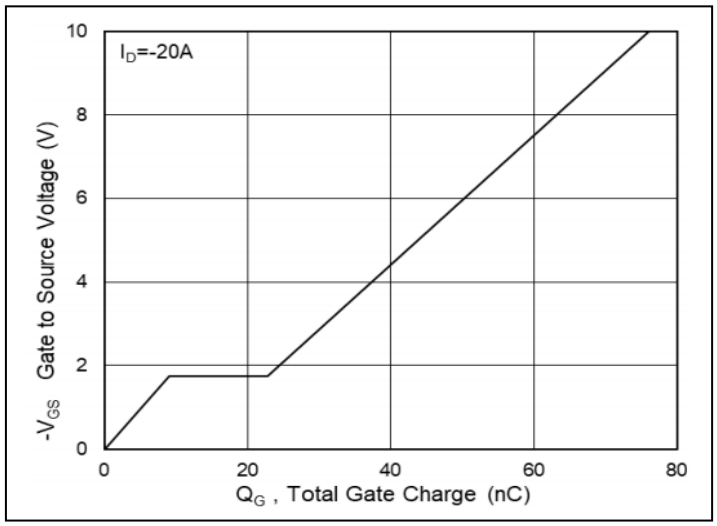


Figure 4. Gate-Charge Characteristics

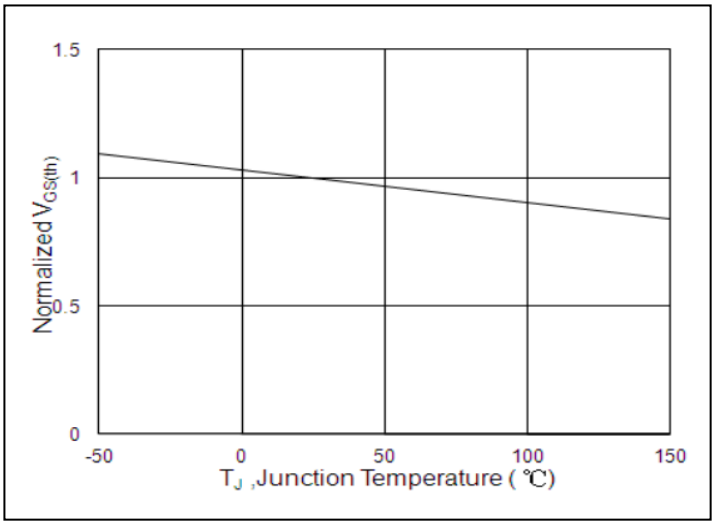


Figure 5. Normalized $V_{GS(th)}$ Vs T_J

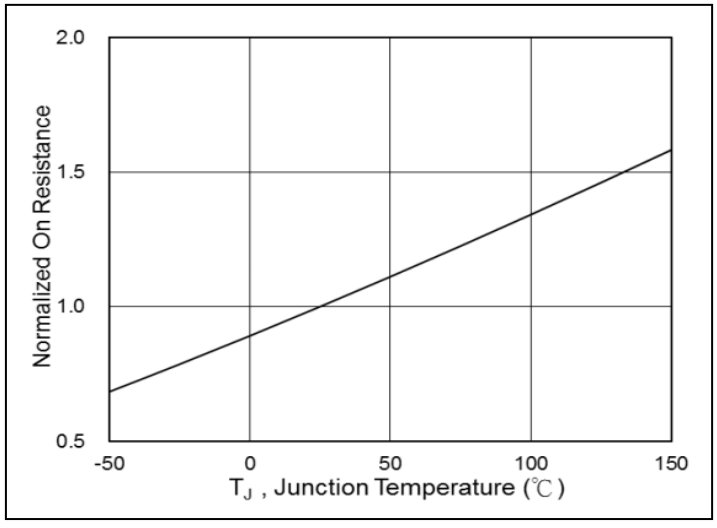


Figure 6. Normalized R_{DSON} Vs T_J

Typical electrical and thermal characteristics

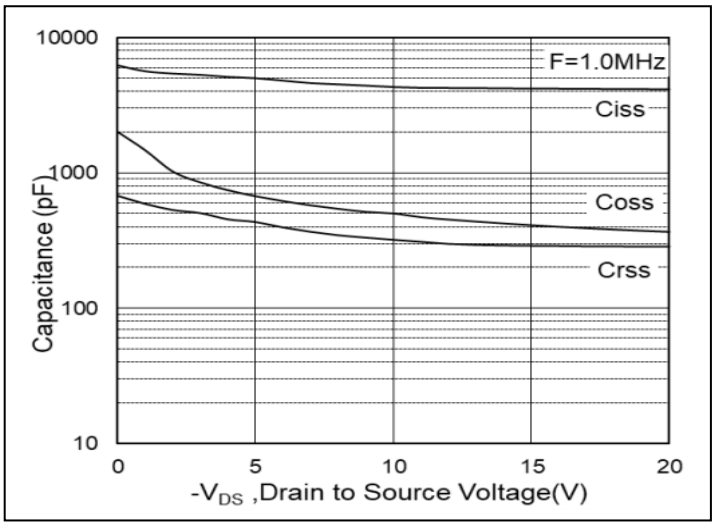


Figure 7. Capacitance

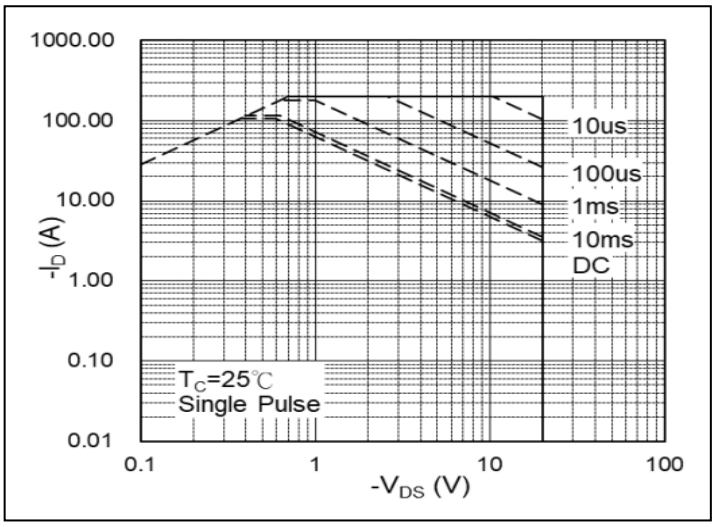


Figure 8. Safe Operating Area

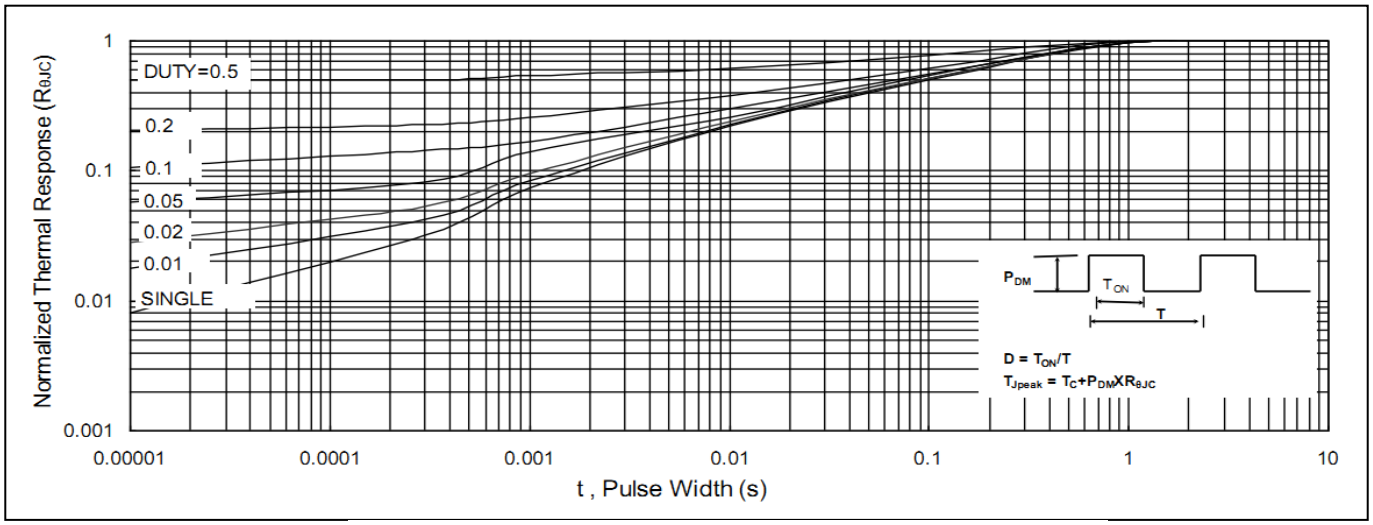
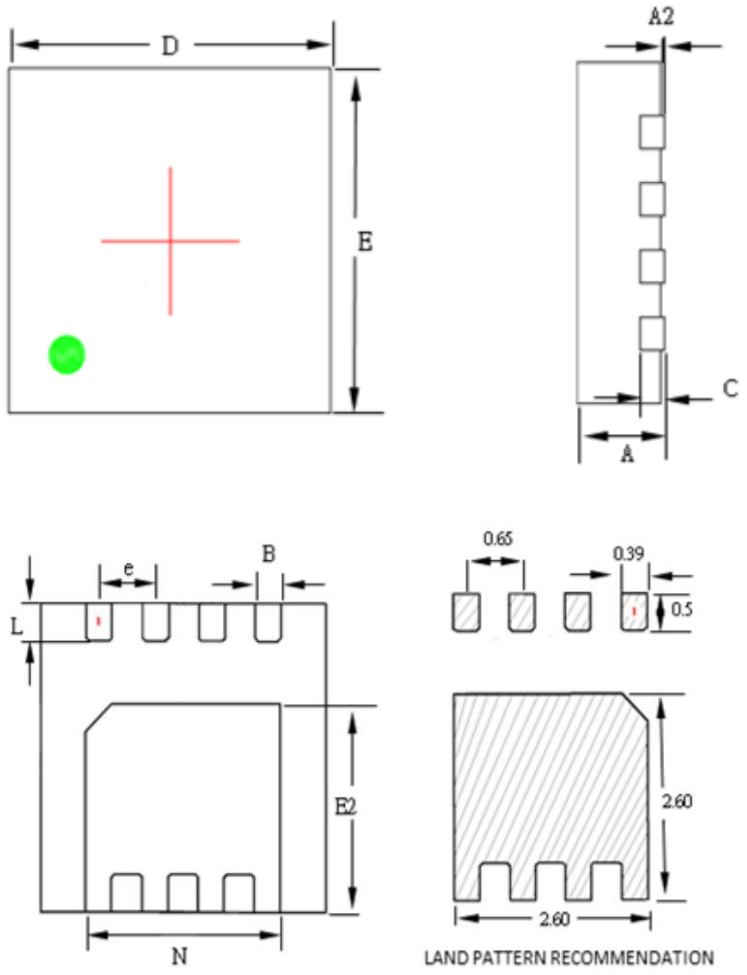


Figure 9. Normalized Maximum Transient Thermal Impedance

Mechanical Data：



SYMBOLS	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.70	0.75	0.80	0.028	0.030	0.031
A2	0.00	--	0.05	0.000	--	0.002
B	0.24	0.30	0.35	0.009	0.012	0.014
C	0.10	0.15	0.25	0.004	0.006	0.010
D	3.15	3.30	3.40	0.124	0.130	0.134
E	3.15	3.30	3.40	0.124	0.130	0.134
E2	2.15	2.25	2.35	0.085	0.089	0.093
L	0.35	0.40	0.45	0.014	0.016	0.018
N	2.10	2.25	2.35	0.083	0.089	0.093
e	--	0.65	--	--	0.026	--

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