N - Channel 30 V (D-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (mΩ)(Typ.)	I_D (A)[a]	Q_g (Typ.)
30	10.5 at V_{GS} = 10 V	36	4.2 nC
	15.5 at V_{GS} = 4.5 V		

FEATURES

- DT-Trench MOSFET
- 100 % R_g and UIS Tested
- Fast Switching Speed
- Low Gate Charge

Pb free
RoHS
COMPLIANT

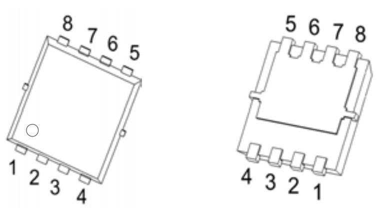
APPLICATIONS

- Battery charging and discharging for battery pack
- Power switch for Adaptor/ Charger

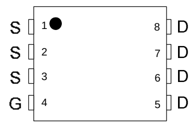
PDFN 3.3x3.3-8L Pin Configuration

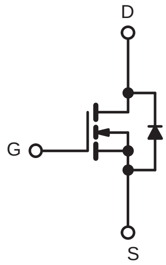
Top View

Bottom View



Top View





N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_C = 25 °C, unless otherwise noted)

PARAMETER		SYMBOL	LIMIT	UNIT
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current (T_J = 150 °C)[a]	T_C = 25 °C	I_D	36	A
	T_C = 100 °C		23	
Pulsed Drain Current[b]		I_{DM}	75	
Single Avalanche Energy		E_{AS}	24	mJ
Maximum Power Dissipation[c]	T_C = 25 °C	P_D	26	W
	T_C = 100 °C		10.4	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to +150	°C

THERMAL RESISTANCE RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Junction-to-Ambient (PCB Mount)[d]	R_{thJA}	75	°C/W
Junction-to-Case (Drain)	R_{thJC}	4.8	

Notes

a. Calculated continuous current based on maximum allowablejunction temperature.
b. Repetitive rating; pulse width limited by max. junction temperature.
c. Pd is based on max. junction temperature, using junction-case thermal resistance.
d. 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 Ta=25 °C.

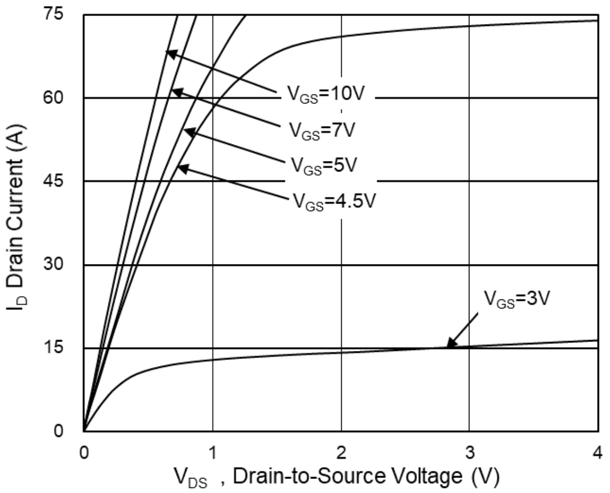
SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = 250 µA	30	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	1.0	-	3.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V	-	-	± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 30 V, V_{GS} = 0 V	-	-	1	µA
		V_{DS} = 24 V, V_{GS} = 0 V, T_J = 55 °C	-	-	5	
On-State Drain Current [a]	$I_{D(on)}$	$V_{DS} \geq$ 5 V, V_{GS} = 5 V	36	-	-	A
Drain-Source On-State Resistance [a]	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 6 A	-	10.5	12.5	mΩ
		V_{GS} = 4.5 V, I_D = 5 A	-	15.5	19	
Forward Transconductance [a]	g_{fs}	V_{DS} = 5 V, I_D = 12 A	-	32	-	S
Dynamic [b]						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 15 V, f = 1 MHz	-	396	-	pF
Output Capacitance	C_{oss}		-	260	-	
Reverse Transfer Capacitance	C_{rss}		-	18	-	
Total Gate Charge [c]	Q_g	V_{DS} = 15 V, V_{GS} = 10 V, I_D = 6 A	-	8.8	-	nC
Gate-Source Charge [c]	Q_{gs}		-	2.6	-	
Gate-Drain Charge [c]	Q_{gd}		-	1.4	-	
Gate Resistance	R_g	f = 1 MHz	-	2.1	-	Ω
Turn-On Delay Time [c]	$t_{d(on)}$	V_{DS} = 15 V, I_D = 1 A, R_g = 1.5 Ω V_{GS} = 10 V	-	13	-	ns
Rise Time [c]	t_r		-	6.3	-	
Turn-Off Delay Time [c]	$t_{d(off)}$		-	21	-	
Fall Time [c]	t_f		-	7	-	
Drain-Source Body Diode Ratings and Characteristics [b] (T_C = 25 °C)						
Continuous Source-Drain Diode Current	I_S	T_C = 25 °C	-	-	36	A
Pulsed Current (t = 100 µs)	I_{SM}		-	-	75	A
Forward Voltage [a]	V_{SD}	I_F = 1 A, V_{GS} = 0 V	-	-	1	V

Notes

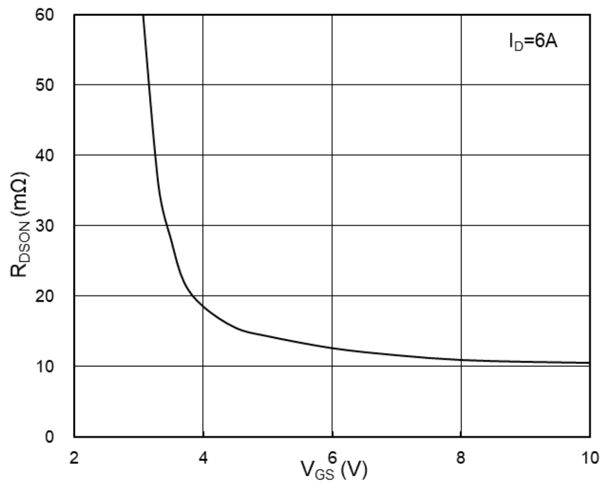
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.
c. Independent of operating temperature.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

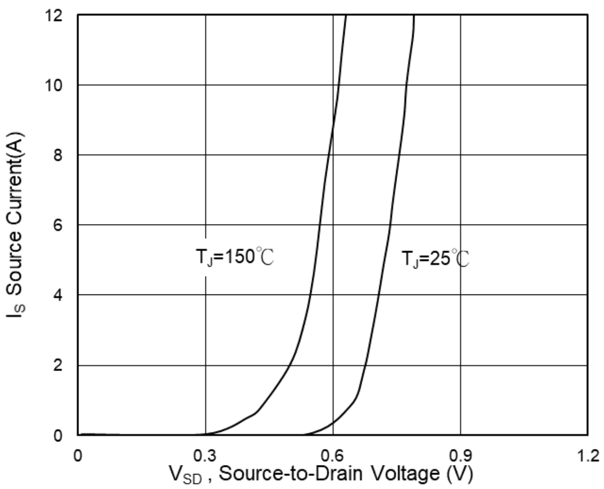
TYPICAL CHARACTERISTICS (25°C , unless otherwise noted)



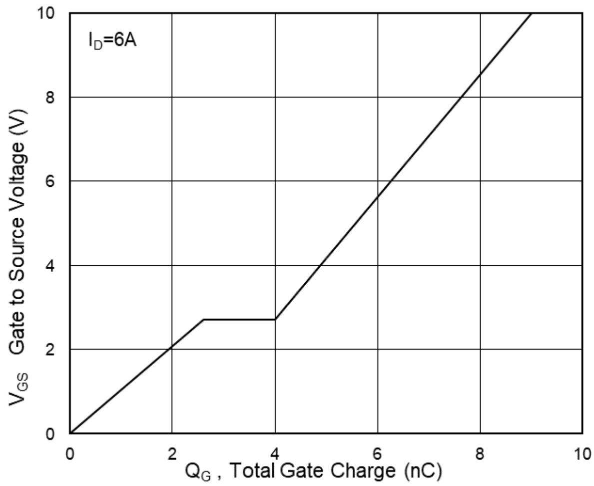
Typical Output Characteristics



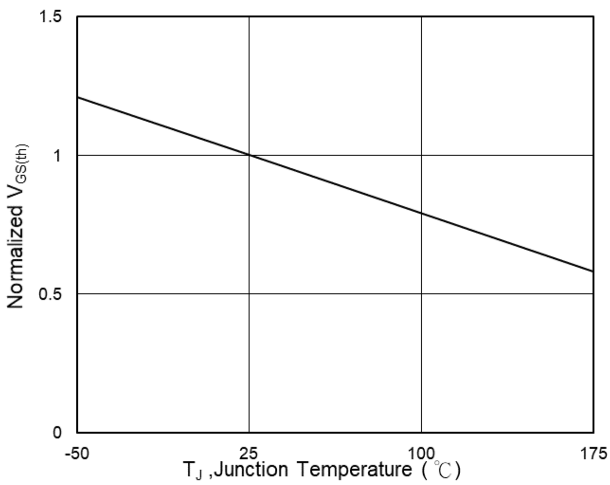
On-Resistance vs G-S Voltage



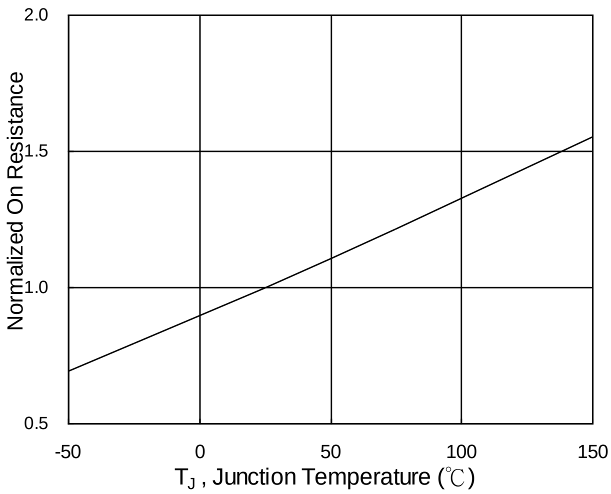
Source Drain Forward Characteristics



Gate-charge Characteristics

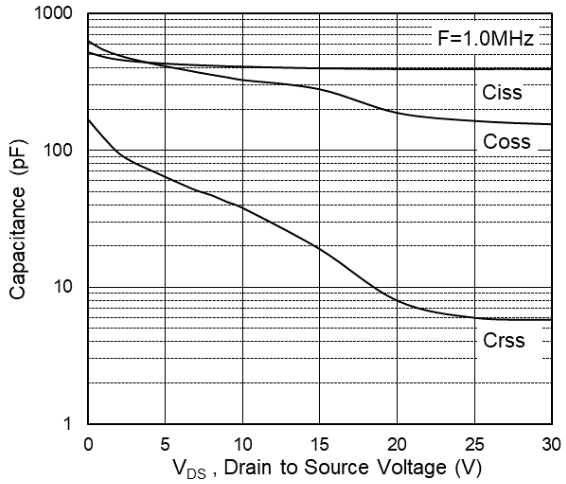


Normalized $V_{GS(th)}$ vs T_J

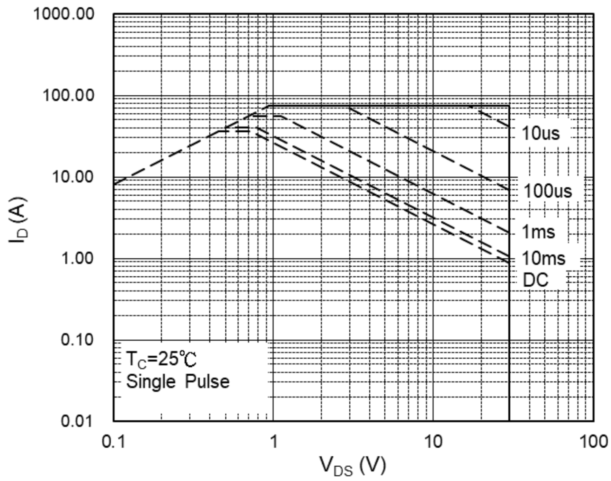


Normalized R_{DSON} vs T_J

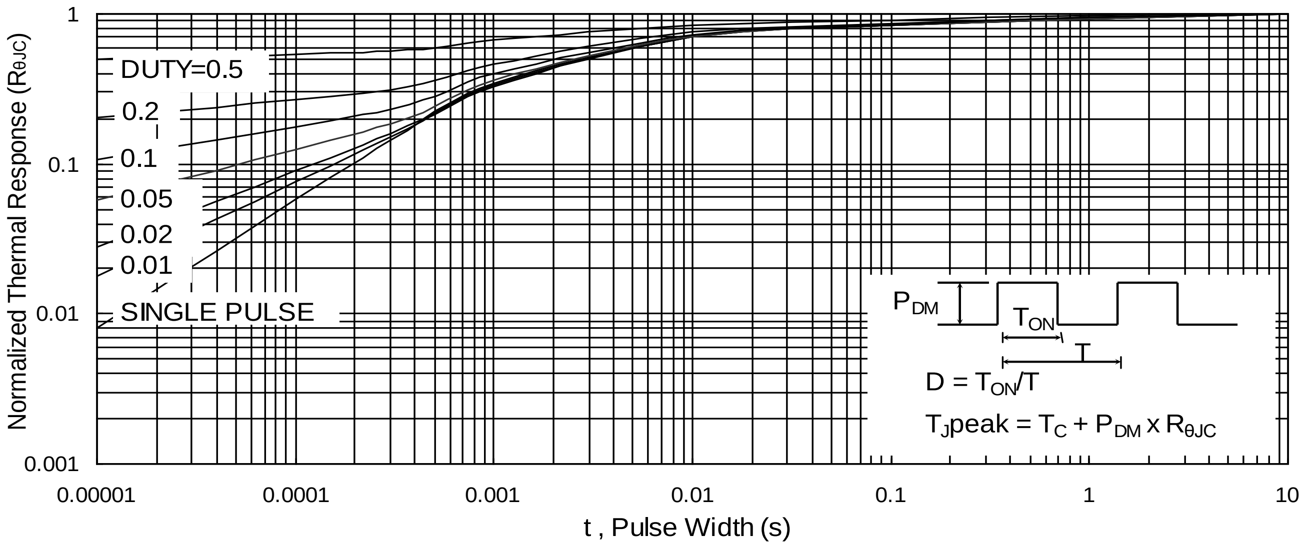
TYPICAL CHARACTERISTICS (25℃, unless otherwise noted)



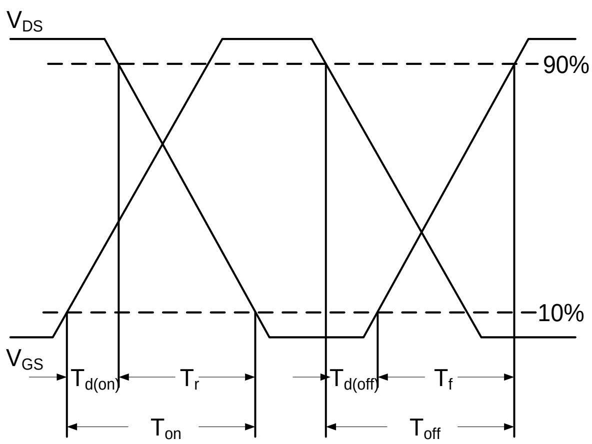
Capacitance



Safe Operating Area

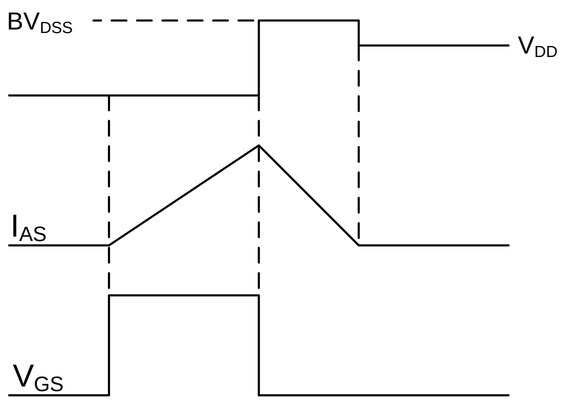


Normalized Maximum Transient Thermal Impedance



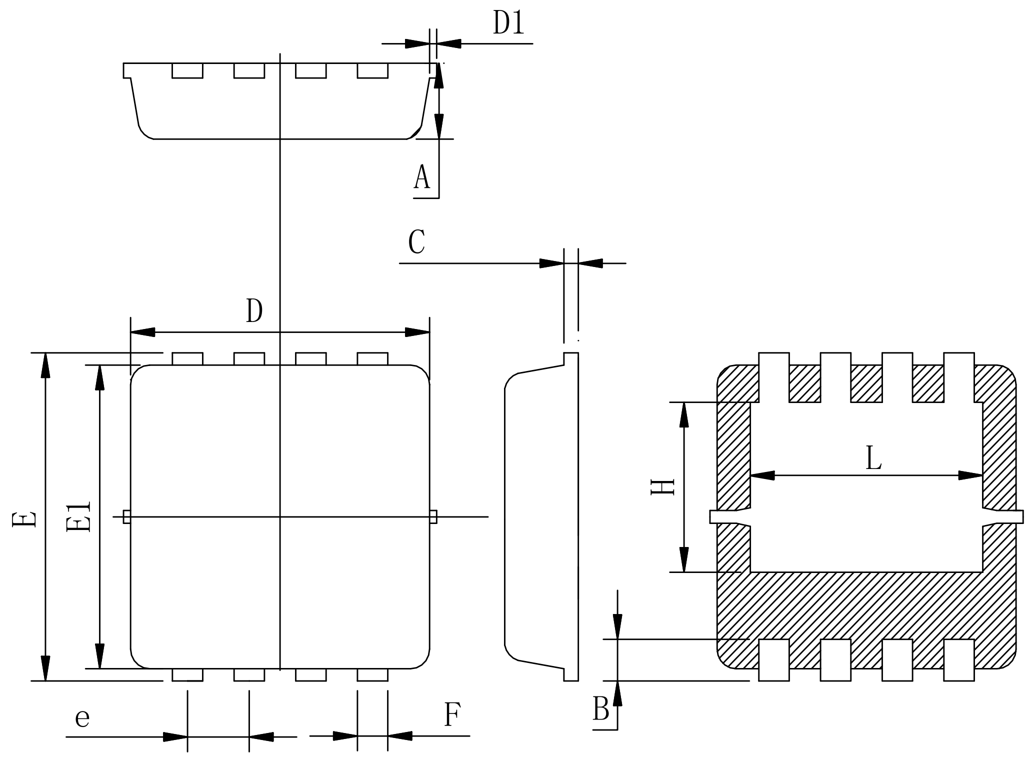
Switching Time Waveform

$$EAS = \frac{1}{2} L \times I_{AS}^{2} \times \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$



Unclamped Inductive Waveform

PDFN 3.3X3.3 PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

Symbol	Min	Typ	Max
A	0.600	0.775	1.000
B	0.20	0.38	0.55
C	0.05	0.15	0.40
D	3.10	3.25	3.50
D1	-	-	0.15
E	3.15	3.35	3.50
E1	2.60	3.10	3.45
e	0.50	0.65	0.80
F	0.15	0.32	0.45
H	1.25	1.73	2.10
L	2.20	2.45	2.85

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