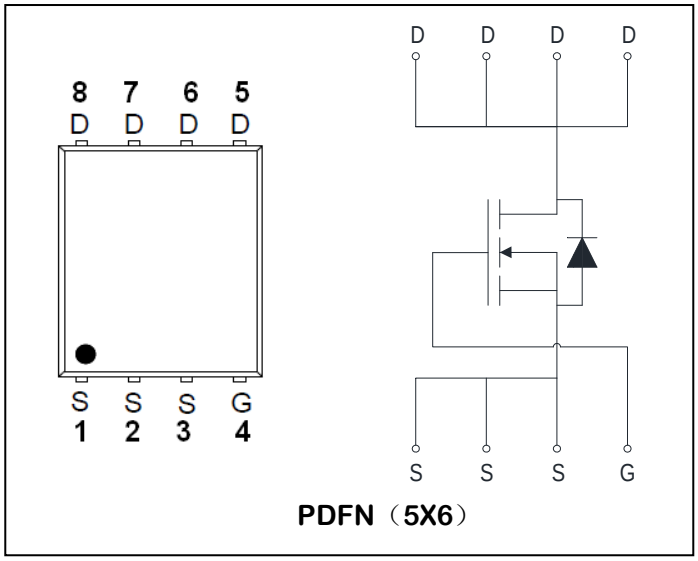
N-Channel Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY

V_{DSS}	I_D	$R_{DS(ON)}$ (mΩ)
60V	100A	4.6mΩ



PDFN（5X6）

Features:

- Low Gate Charge for Fast Switching Application
- Low $R_{DS(ON)}$ to Minimize Conductive Loss
- 100% EAS Guaranteed
- Optimized $V_{(BR)DSS}$ Ruggedness
- Green Device Available

Description:

These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. design to provide excellent $R_{DS(ON)}$ with low gate charge.provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.These devices are well suited for high efficiency fast switching applications.

Absolute Maximum Ratings (T_A = 25°C unless otherwise specifed)

Symbol	Parameter		Ratings	Unit
Common Ratings				
V_{DSS}	Drain-Source Voltage		60	V
V_{GSS}	Gate-Source Voltage		±20	
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to150	°C
I_S	Diode Continuous Forward Current	T_C =25°C	100	A
Mounted on Large Heat Sink				
I_{DM}	300μs Pulse Drain Current Tested (2)	T_C=25°C, V_{GS}=10V	400	A
I_D	Continuous Drain Current (1)	T_C=25°C, V_{GS}=10V	100	A
		T_C=100°C V_{GS}=10V	63	A
P_D	Maximum Power Dissipation	T_C=25°C	142	W

Thermal Characteristics

Symbol	Parameter	Ratings	Unit
R_{thJC}	Thermal resistance junction-case max (1)	0.88	°C/W
R_{thJA}	Thermal resistance junction-ambient max (1)	62	°C/W

Electrical Characteristics (TA=25°C Unless Otherwise Noted)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
On/off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250uA	60	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V, V_{GS}=0V, T_J=25°C	--	--	1	uA
		V_{DS}=48V,V_{GS}=0V T_J=125°C	--	--	10	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250uA	1.0	1.6	2.5	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V	--	--	±100	nA
$R_{DS(ON)}$	Drain-SourceOn-stateResistance(2)	V_{GS}= 10V, I_{DS}=20A	--	3.8	4.6	mΩ
		V_{GS}= 4.5V, I_{DS}=10A	--	4.2	5.5	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS}=0V,	--	6805	10000	pF
C_{oss}	Output Capacitance	V_{DS}= 25V,	--	445	680	
C_{rss}	Reverse Transfer Capacitance	Frequency=1.0MHz	--	195	280	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time(1)	V_{DD}=30V,	--	19.2	40	ns
t_r	Turn-on Rise Time(1)	I_D= 1A, V_{GS}= 10V,	--	56.3	120	
$t_{d(OFF)}$	Turn-off Delay Time(1)	R_{GEN}=6Ω R_L=0.94Ω	--	90.8	200	
t_f	Turn-off Fall Time(1)		--	21.6	40	
Q_g	Total Gate Charge(1)	V_{DS}=30V, V_{GS}= 4.5V,	--	58.2	116	nC
Q_{gs}	Gate-Source Charge(1)	I_{DS}=10A	--	16.2	32	
Q_{gd}	Gate-Drain Charge(1)		--	23.4	46	
Avalanche Characteristics						
EAS	Single Pulse Avalanche Energy (3)	V_{DD}=25V,L=0.1mH ,V_{GS}=10 V,R_g=25Ω, I_{AS}=60.1A T_J=25°C,	450	--	--	mJ
Diode Characteristics						
V_{SD}	Diode Forward Voltage(2)	I_{SD} = 1A, V_{GS} = 0, T_J=25°C	--	--	1.0	V

NOTES:

1. Surface Mounted on FR4 Board, t ≤ 10 sec.

2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3.The Min. value is 100% EAS tested guarantee.

Typical Performance Characteristics

Figure 1: Continuous Drain Current vs.Tc

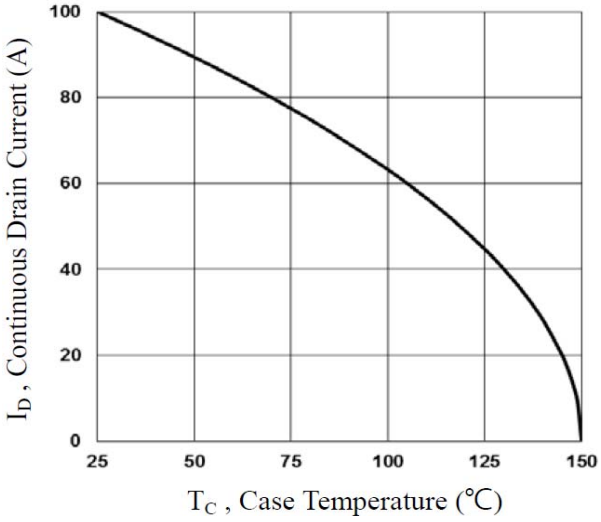


Figure 2: Normalized RDSON vs.TJ

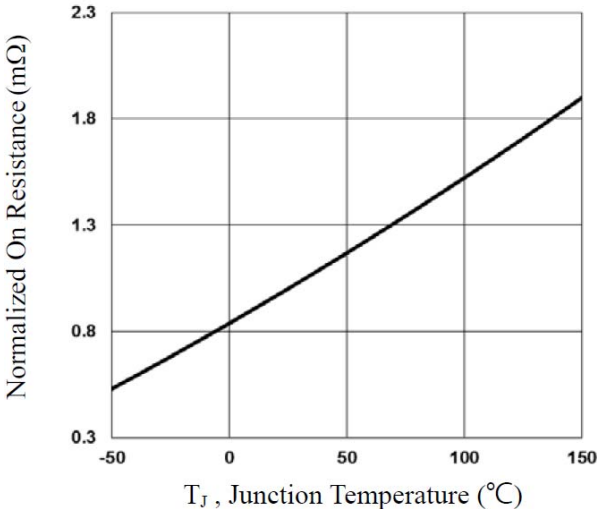


Figure 3: Normalized Vth vs.TJ

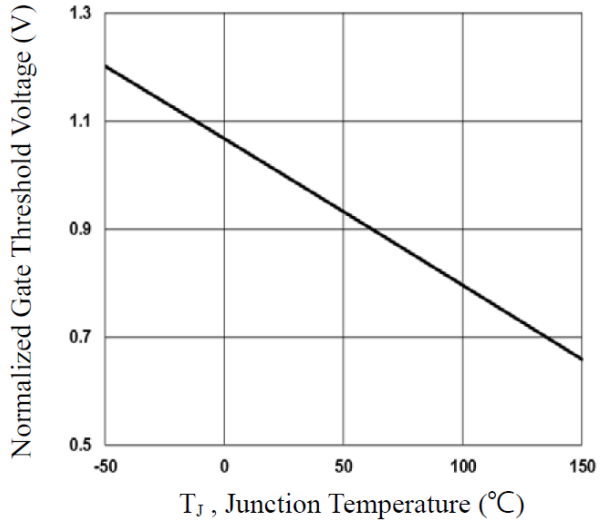


Figure 4: Gate Charge Waveform

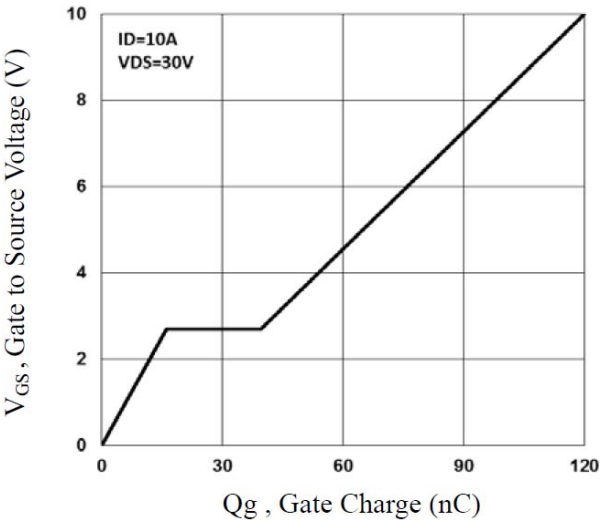


Figure 5: Normalized Transient Response

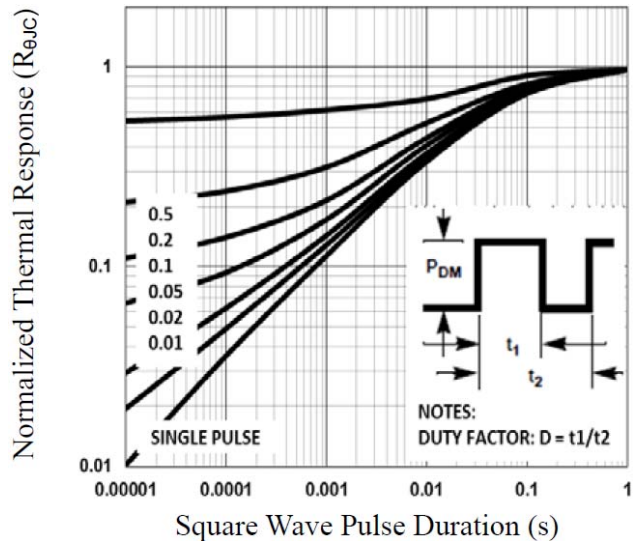


Figure 6: Maximum Safe Operation Area

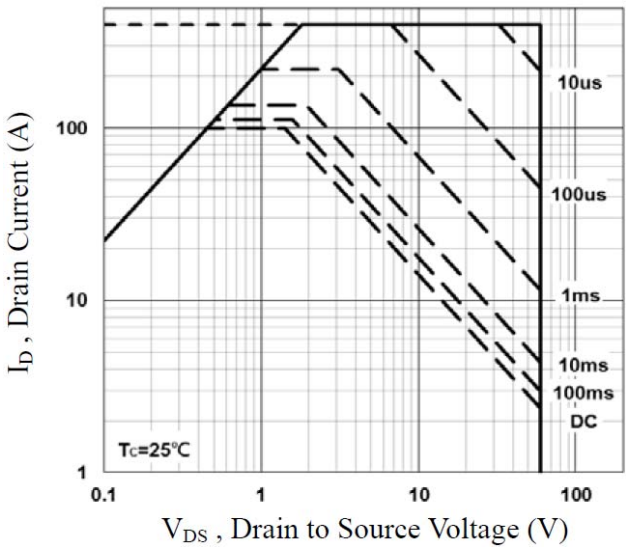


Figure 7: Switching Time Waveform

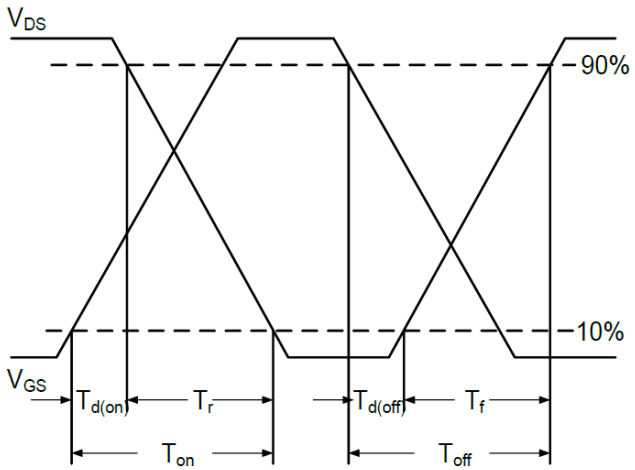
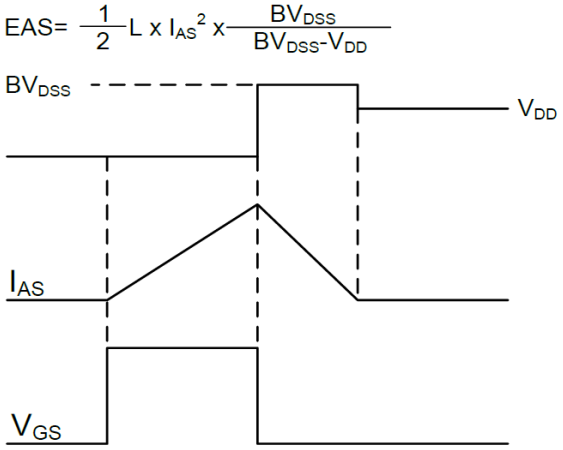
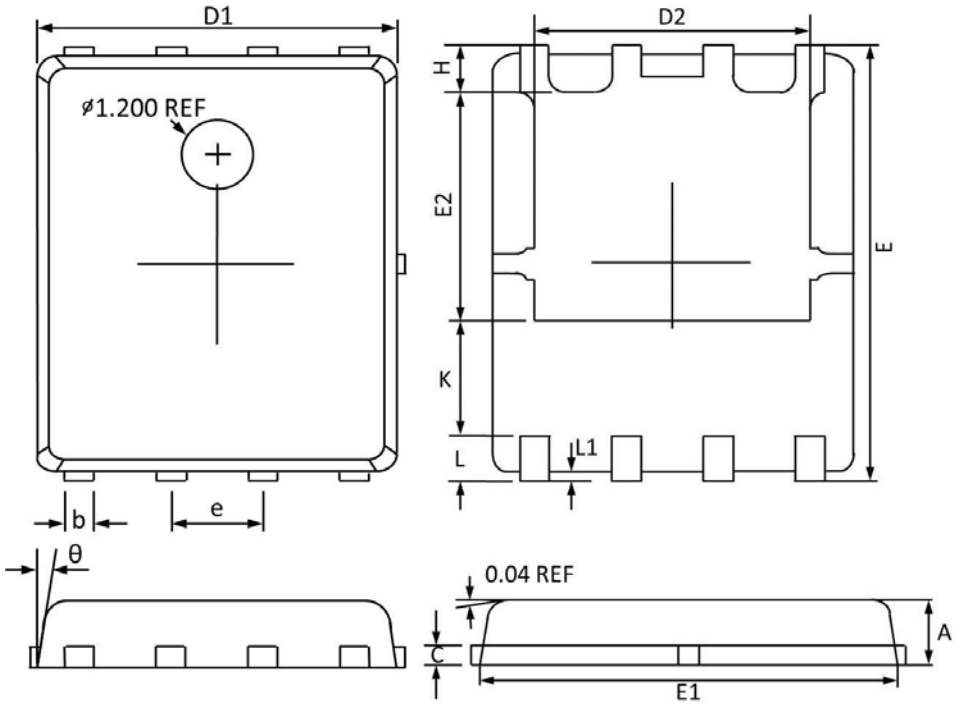


Figure 8: EAS Waveform



PACKAGE MECHANICAL DATA

PDFN（5X6） Package Dimension



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.800	1.100	0.031	0.043
b	0.330	0.510	0.013	0.020
c	0.200	0.300	0.008	0.012
D1	4.800	5.100	0.189	0.201
D2	3.610	4.100	0.142	0.161
E	5.900	6.200	0.232	0.244
E1	5.700	5.900	0.224	0.232
E2	3.350	3.780	0.132	0.149
H	0.410	0.700	0.016	0.028
K	1.100	1.500	0.043	0.059
e	1.270 TYP.		0.050 TYP.	
L	0.510	0.710	0.020	0.028
L1	0.060	0.200	0.002	0.008
θ	0°	12°	0°	12°