

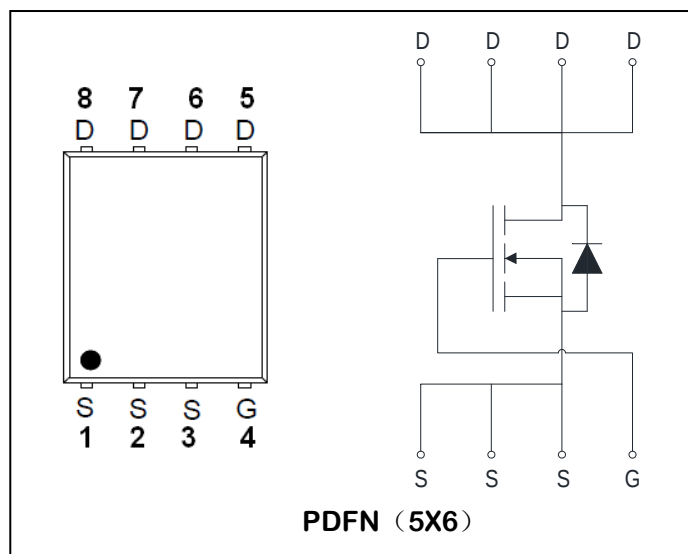
N-Channel Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY

V_{DSS}	I_D	$R_{DS(ON)}$ (m Ω)
65V	100A	2.8m Ω

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 ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter		Ratings	Unit
Common Ratings				
V _{DSS}	Drain-Source Voltage		65	V
V _{GSS}	Gate-Source Voltage		+20/-12	
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	$^\circ\text{C/W}$
R_{thJA}	Thermal resistance junction-ambient max ⁽¹⁾	62	$^\circ\text{C/W}$

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	655	--	--	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	--	2.3	2.8	mΩ
		V _{GS} = 4.5V, I _{DS} =10A	--	4.2	5.4	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} = 25V, Frequency=1.0MHz	--	4780	9500	pF
C _{oss}	Output Capacitance		--	1365	2700	
C _{rss}	Reverse Transfer Capacitance		--	51	102	
Switching Characteristics						
t _{d(ON)}	Turn-on Delay Time ⁽¹⁾	V _{DD} =30V, I _D = 1A, V _{GS} = 10V, R _{GEN} =6 Ω R _L =0.94 Ω	--	22	44	ns
t _r	Turn-on Rise Time ⁽¹⁾		--	14	28	
t _{d(OFF)}	Turn-off Delay Time ⁽¹⁾		--	40	80	
t _f	Turn-off Fall Time ⁽¹⁾		--	20	40	
Q _g	Total Gate Charge ⁽¹⁾	V _{DS} =48V, V _{GS} = 10V, I _{DS} =10A	--	59	120	nC
Q _{gs}	Gate-Source Charge ⁽¹⁾		--	10.4	20	
Q _{gd}	Gate-Drain Charge ⁽¹⁾		--	19.6	38	
Avalanche Characteristics						
EAS	Single Pulse Avalanche Energy ⁽³⁾	V _{DD} =25V,L=0.1mH ,V _{GS} =10 V,R _g =25 Ω , I _{AS} =70A T _J =25°C,	245	--	--	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. T_C

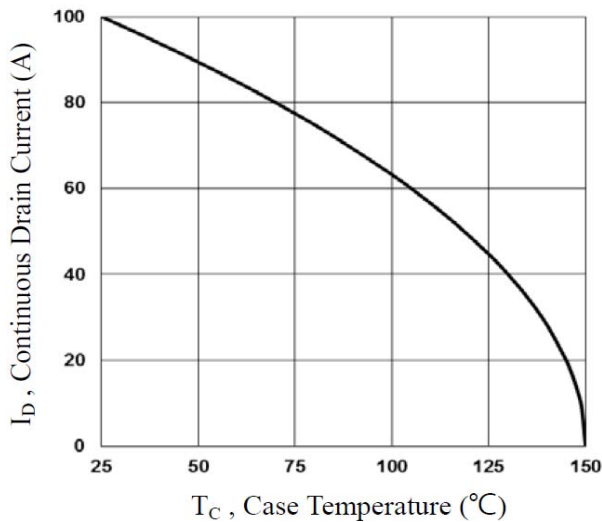


Figure 2: Normalized $R_{DS(on)}$ vs. T_J

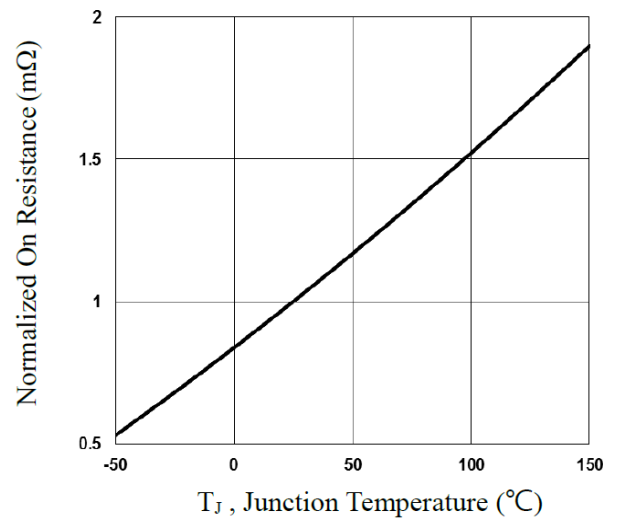


Figure 3: Normalized V_{th} vs. T_J

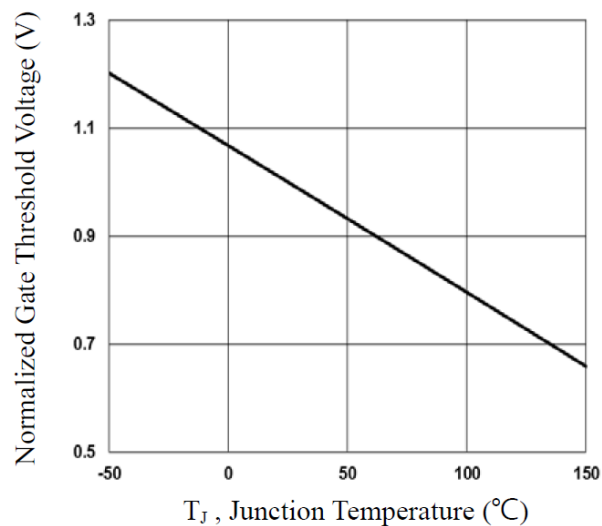


Figure 4: Gate Charge Waveform

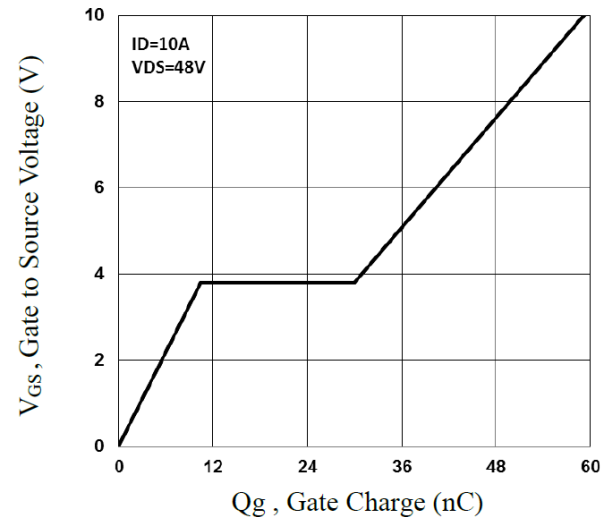


Figure 5: Normalized Transient Response

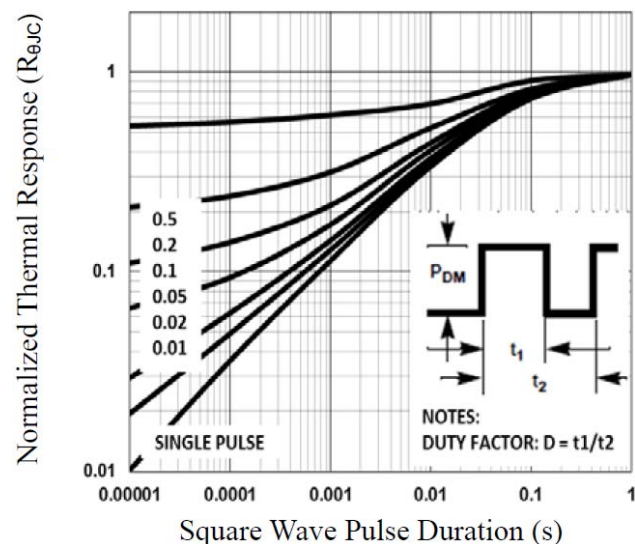


Figure 6: Maximum Safe Operation Area

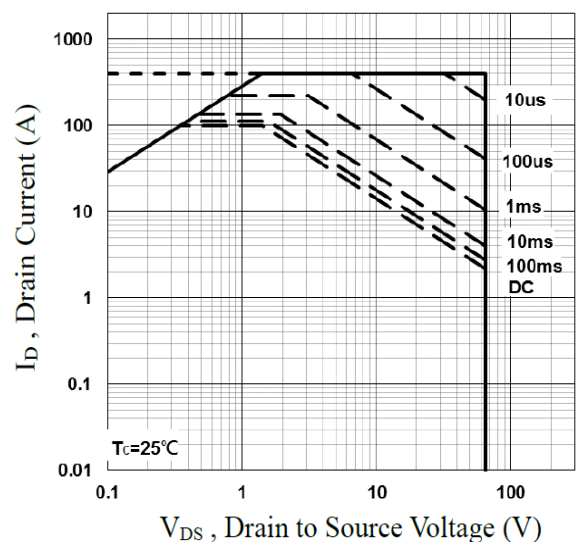


Figure 7: Switching Time Waveform

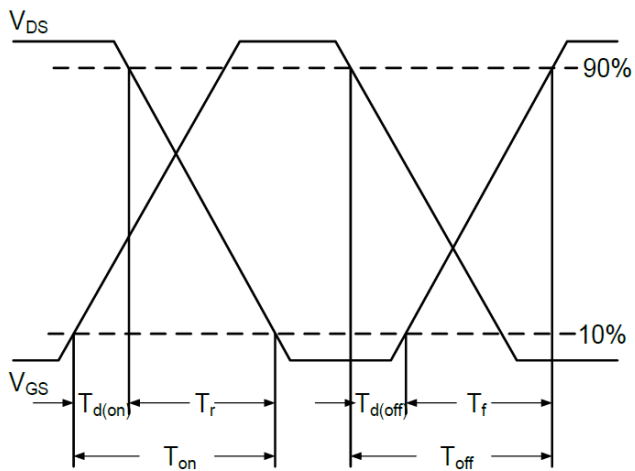
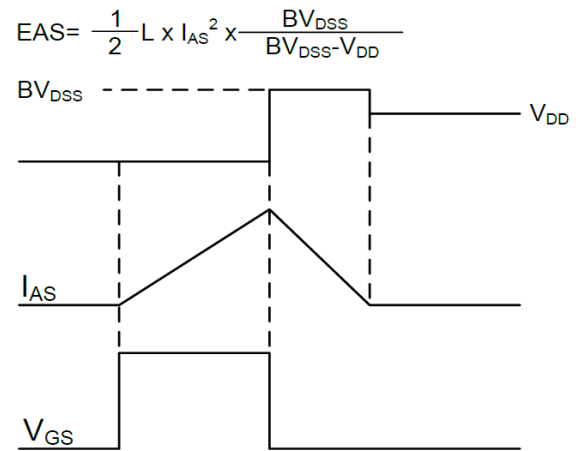
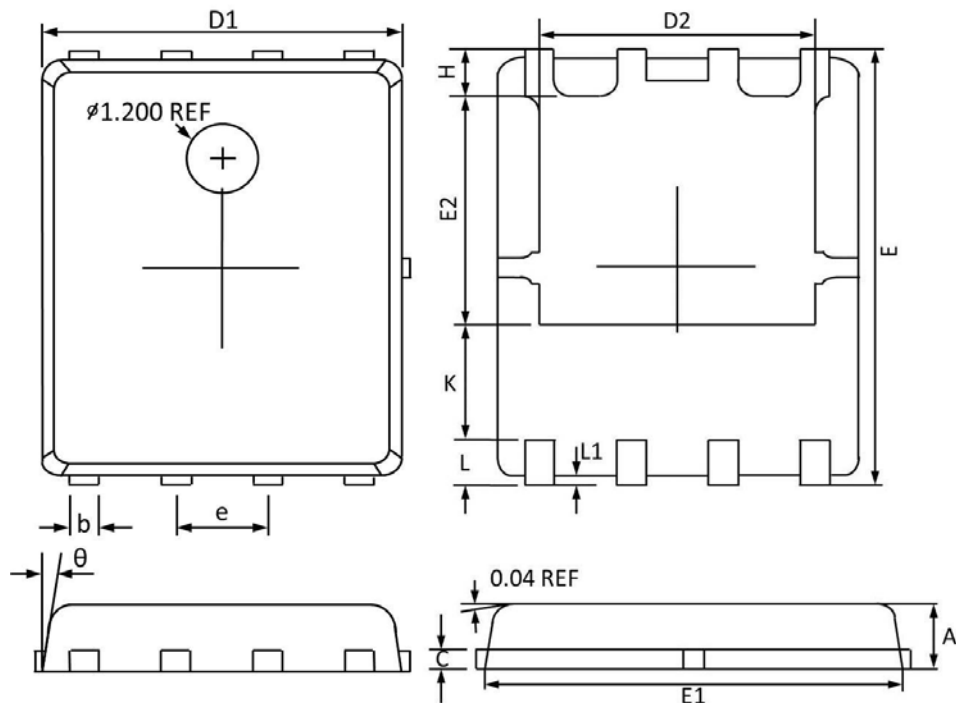


Figure 8: EAS Waveform



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°