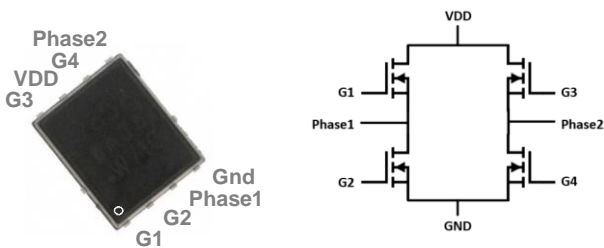


General Description

These Quad N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, 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.

PPAK5x6 4 in 1 Pin Configuration



BVDSS	RDSON	ID
30V	15.5mΩ	15A

Features

- 30V, 15A, $R_{DS(ON)} = 15.5m\Omega @ V_{GS} = 10V$
- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed
- Green Device Available

Applications

- Full Bridge Applications
- Wireless charger Applications

Absolute Maximum Ratings $T_c=25^\circ C$ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current – Continuous ($T_c=25^\circ C$)	15	A
	Drain Current – Continuous ($T_c=100^\circ C$)	9.5	A
I_{DM}	Drain Current – Pulsed ¹	60	A
EAS	Single Pulse Avalanche Energy ²	45	mJ
IAS	Single Pulse Avalanche Current ²	30	A
P_D	Power Dissipation ($T_c=25^\circ C$)	9.7	W
	Power Dissipation – Derate above $25^\circ C$	0.08	W/ $^\circ C$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	62	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	12.8	$^\circ C/W$

Electrical Characteristics (T_J=25 °C, unless otherwise noted)
Static State Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	30	---	---	V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =1mA	---	0.04	---	V/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =30V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =24V, V _{GS} =0V, T _J =125°C	---	---	10	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
R _{DS(ON)}	Static Drain-Source On-Resistance ³	V _{GS} =10V, I _D =6A	---	13	15.5	mΩ
		V _{GS} =4.5V, I _D =5A	---	15	19	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.2	1.6	2.5	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	-4	---	mV/°C
gfs	Forward Transconductance	V _{DS} =10V, I _D =3A	---	6	---	S

Dynamic Characteristics

Q _g	Total Gate Charge ^{3, 4}	V _{DS} =15V, V _{GS} =10V, I _D =6A	---	16.7	33	nC
Q _{gs}	Gate-Source Charge ^{3, 4}		---	4.5	8	
Q _{gd}	Gate-Drain Charge ^{3, 4}		---	1.3	2.6	
T _{d(on)}	Turn-On Delay Time ^{3, 4}	V _{DD} =15V, V _{GS} =10V, R _G =3.3Ω I _D =15A	---	4.8	9	ns
T _r	Rise Time ^{3, 4}		---	12.5	24	
T _{d(off)}	Turn-Off Delay Time ^{3, 4}		---	27.6	52	
T _f	Fall Time ^{3, 4}		---	8.2	16	
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, F=1MHz	---	680	1000	pF
C _{oss}	Output Capacitance		---	150	220	
C _{rss}	Reverse Transfer Capacitance		---	70	105	
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	---	2.7	5.4	Ω

Drain-Source Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V, Force Current	---	---	15	A
I _{SM}	Pulsed Source Current ³		---	---	30	A
V _{SD}	Diode Forward Voltage ³	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	1	V
t _{rr}	Reverse Recovery Time	V _{GS} =0V, I _S =10A, di/dt=100A/μs	---	8.1	---	ns
Q _{rr}	Reverse Recovery Charge	T _J =25°C	---	1.6	---	nC

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=30A., R_G=25Ω, Starting T_J=25°C.
3. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
4. Essentially independent of operating temperature.

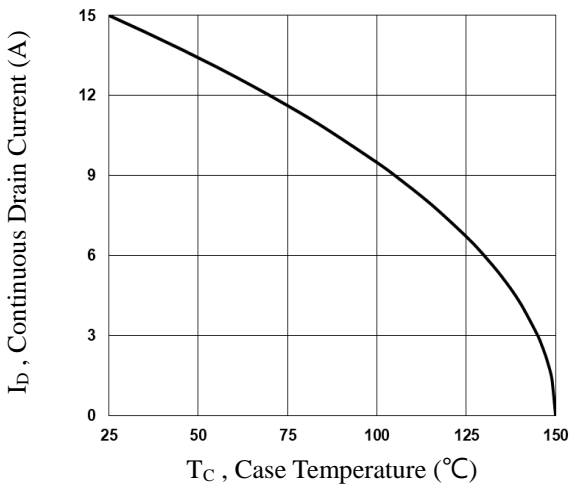


Fig.1 Continuous Drain Current vs. T_c

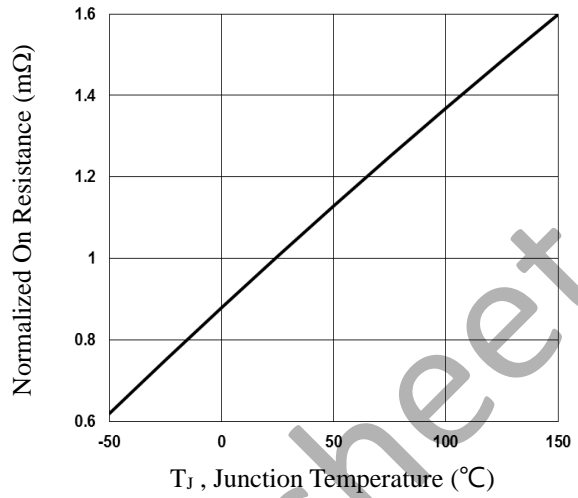


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

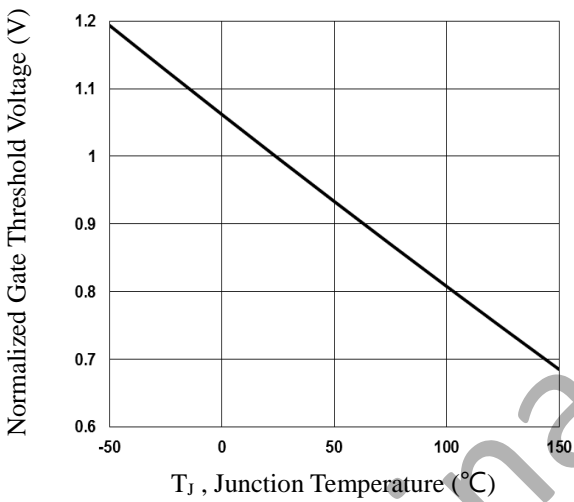


Fig.3 Normalized V_{th} vs. T_j

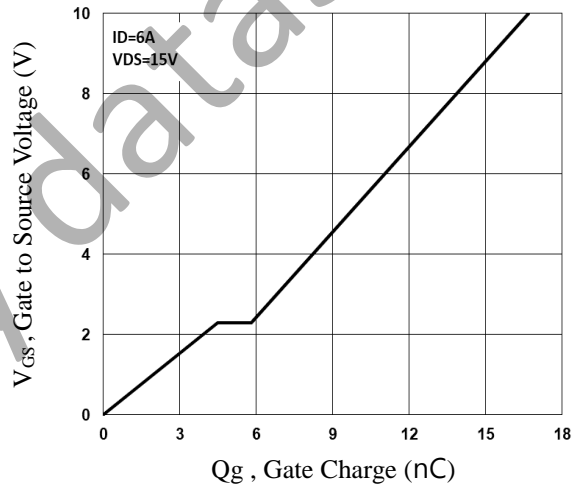


Fig.4 Gate Charge Waveform

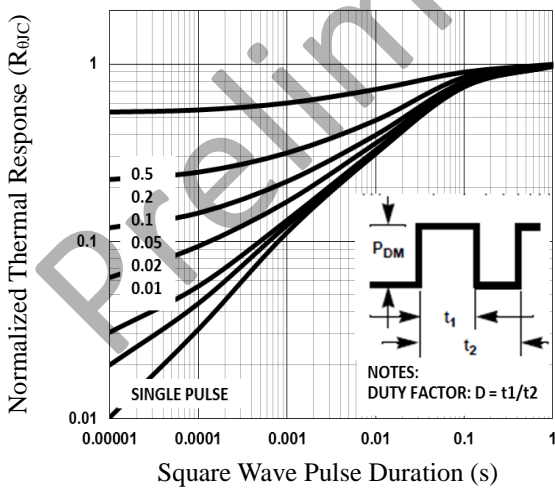


Fig.5 Normalized Transient Impedance

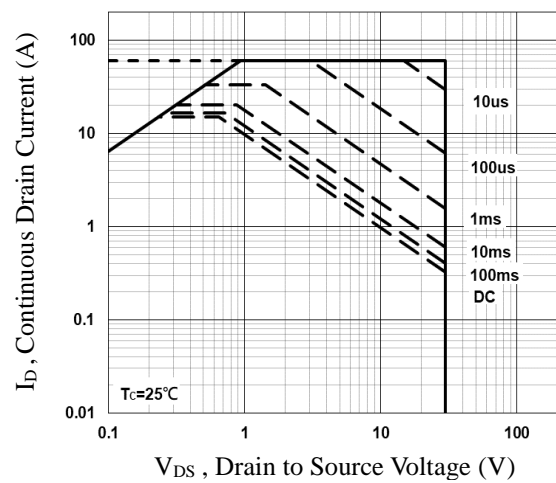


Fig.6 Maximum Safe Operation Area

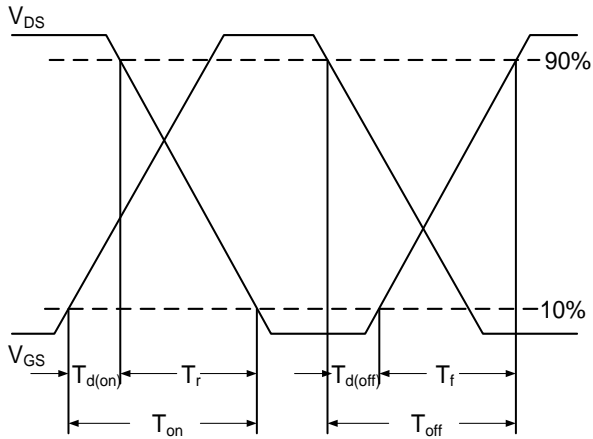


Fig.7 Switching Time Waveform

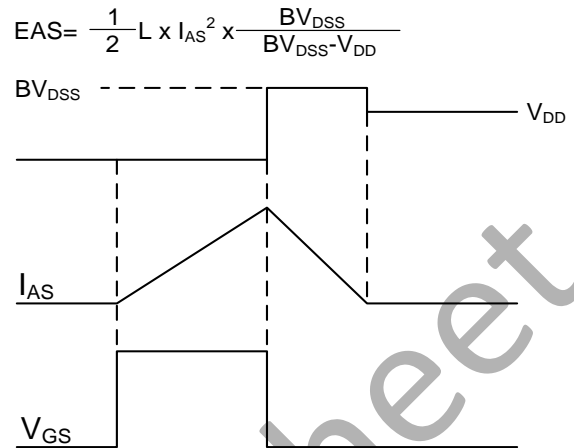


Fig.8 EAS Waveform

Preliminary datasheet

PPAK5x6 4 in 1 PACKAGE INFORMATION

