



P3MPG040



60V P-Channel MOSFETs

General Description

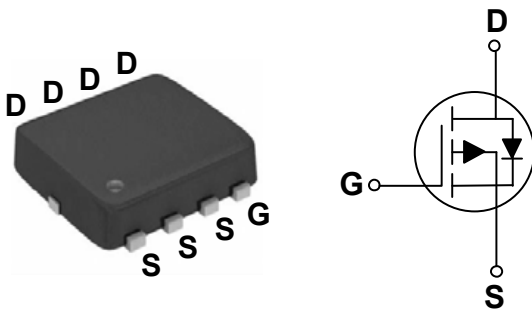
The P3MPG040 uses advanced trench technology and designs to provide excellent $R_{DS(ON)}$ with low gate charge.

BV_{DSS}	$R_{DS(ON)}$	I_D
-60 V	40 m Ω	-24 A

Features

- $R_{DS(ON)} \leq 40m\Omega @ V_{GS} = -10V$
- Fast switching
- Green Device Available
- Reliable and Rugged

PPAK3X3 Pin Configuration



Applications

- DC/DC Converter
- Power Management
- Load Switch

Absolute Maximum Ratings $T_J=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current - Continuous ($T_C=25^\circ\text{C}$)	-24	A
	Drain Current - Continuous ($T_C=100^\circ\text{C}$)	-15	A
I_{DM}	Drain Current - Pulsed ($T_C=25^\circ\text{C}$) (NOTE 1)	-59	A
EAS	Single Pulse Avalanche Energy	31	mJ
IAS	Single Pulse Avalanche Current	-25	A
P_D	Power Dissipation ($T_C=25^\circ\text{C}$)	42	W
T_J	Maximum Junction Temperature	150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
Marking Code		PG040	

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	---	80	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	3	$^\circ\text{C/W}$



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

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D = -250uA	-60	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} = -48V, V _{GS} =0V	---	---	-1	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} = ±20V, V _{DS} =0V	---	---	±100	nA

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
R _{DS(ON)}	Static Drain-Source On-Resistance (NOTE 2)	V _{GS} = -10V, I _D = -8A	---	---	40	mΩ
		V _{GS} = -4.5V, I _D = -5A	---	---	50	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D = -250uA	-1.0	-1.8	-2.5	V
g _{fs}	Forward Transconductance	V _{DS} = -10V, I _D = -4A	---	12	---	S

Dynamic and switching Characteristics (NOTE 3)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q _g	Total Gate Charge	V _{DS} = -30V, V _{GS} = -10V, I _D = -8A	---	52.6	---	nC
Q _{gs}	Gate-Source Charge		---	9	---	
Q _{gd}	Gate-Drain Charge		---	7	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} = -30V, V _{GS} = -10V, R _{GEN} = 6Ω, I _D = -1A	---	9.2	---	nS
T _r	Rise Time		---	22	---	
T _{d(off)}	Turn-Off Delay Time		---	85.4	---	
T _f	Fall Time		---	25.6	---	
C _{iss}	Input Capacitance	V _{DS} = -30V, V _{GS} = 0V, F= 1MHZ	---	2460	---	pF
C _{oss}	Output Capacitance		---	112	---	
C _{rss}	Reverse Transfer Capacitance		---	77	---	
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHZ	---	3.35	---	Ω

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G = V _D = 0V, Force Current	---	---	-19	A
V _{SD}	Diode Forward Voltage (NOTE 2)	V _{GS} = 0V, I _S = -1A	---	---	-1.1	V
t _{rr}	Reverse Recovery Time	I _F = -1A, V _{GS} =0, di/dt=100A/us	---	35	---	nS
Q _{rr}	Reverse Recovery Charge		---	7.3	---	nC

NOTES :

1. Max. current is limited by junction temperature.
2. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
3. Guaranteed by design, not subject to production testing.



Characteristics Curves

FIG. 1-Drain Current

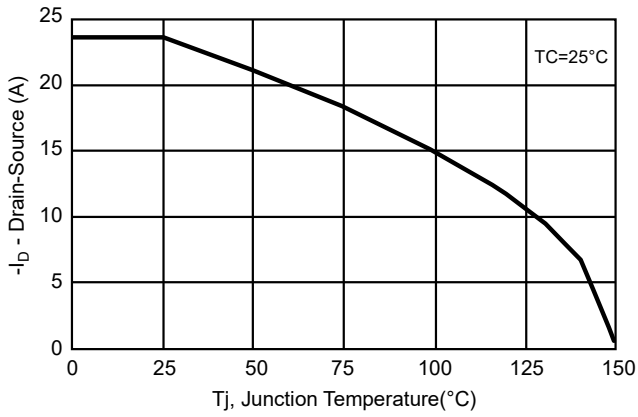


FIG. 2-On-Resistance vs. I_D

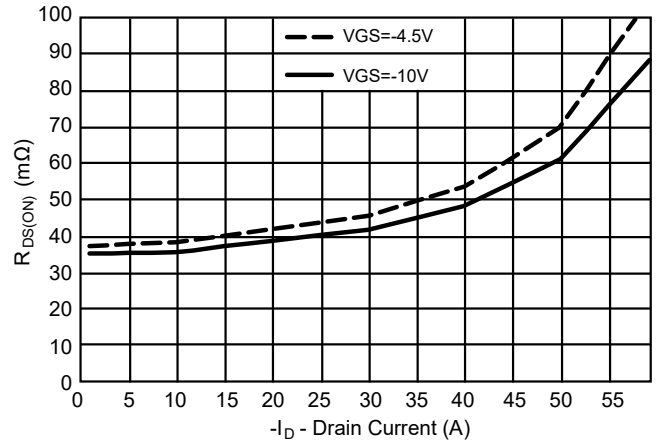


FIG. 3-Gate Threshold Voltage

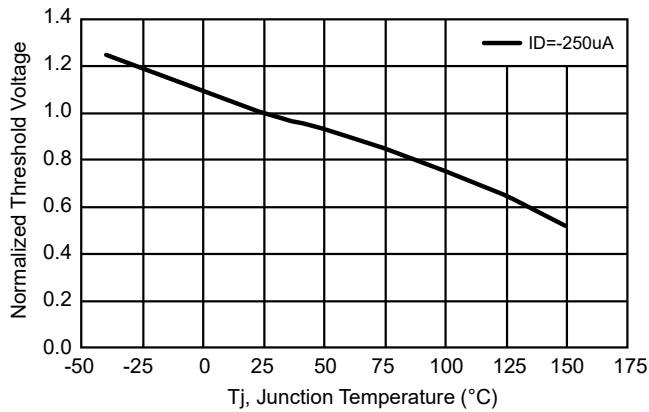


FIG. 4-Gate Charge Characteristics

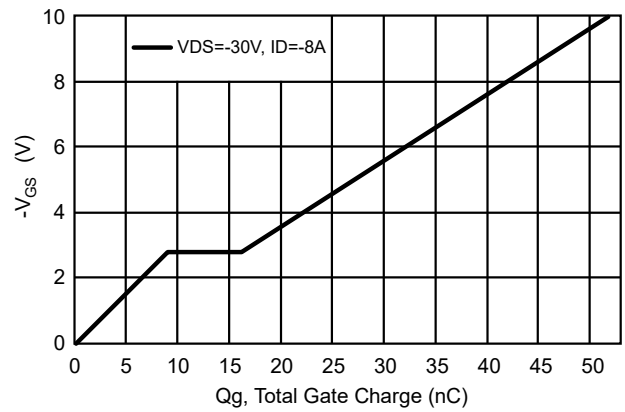


FIG. 5-Safe Operating Area

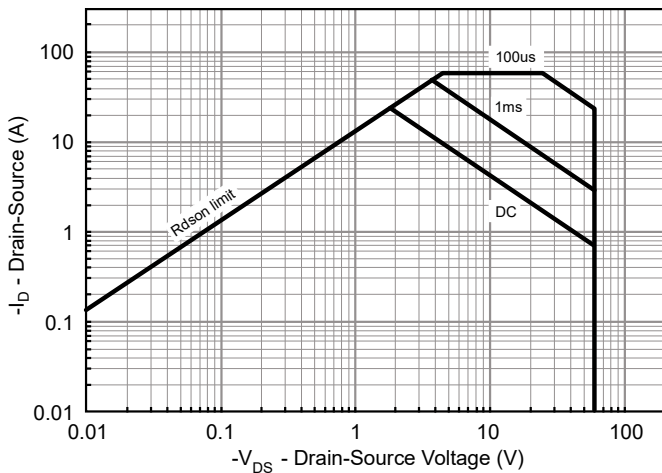
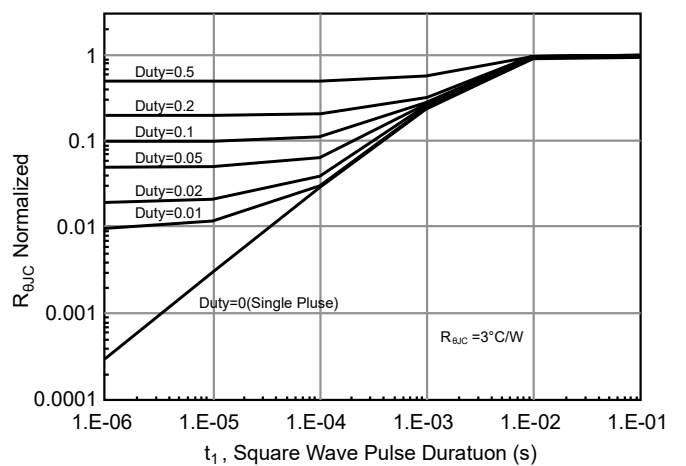
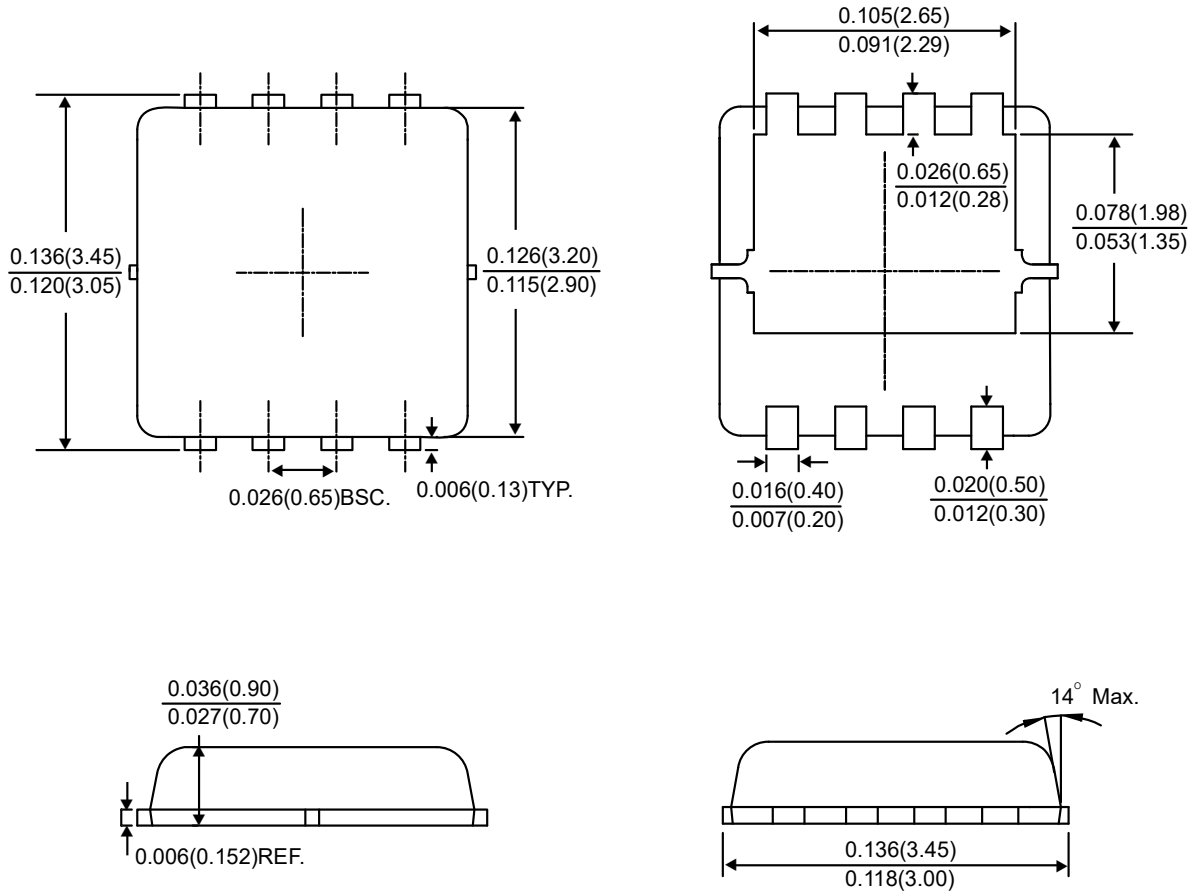


FIG. 6- $R_{\theta JC}$ Transient Thermal Impedance





Package Outline Dimensions



PPAK3X3

Dimensions in inches and (millimeters)



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