



60V N-Channel MOSFETs

General Description

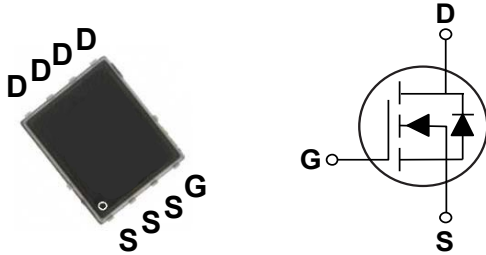
These N-Channel enhancement mode power field effect transistors are using SGT MOSFET technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

BV_{DSS}	$R_{DS(ON)}$	I_D
60 V	3 m Ω	130 A

Features

- $R_{DS(ON)} \leq 3m\Omega @ V_{GS}=10V$
- Fast Switching
- Improved dv/dt Capability
- Green Device Available

PPAK5X6 Pin Configuration



Applications

- Consumer Electronic Power Supply Motor Control
- Synchronous-Rectification Isolated DC
- Synchronous-Rectification Applications

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 (NOTE 1)	130	A
I_{DM}	Drain Current - Pulsed (NOTE 2)	390	A
EAS	Single Pulse Avalanche Energy (NOTE 3)	80	mJ
P_D	Power Dissipation ($T_C=25^\circ\text{C}$)	140	W
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
Marking Code		NG3P0	

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	62	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction to Case	0.89	$^\circ\text{C/W}$



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} =60V, 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	V _{GS} =10V, I _D =20A	---	---	3	mΩ
		V _{GS} =4.5V, I _D =10A	---	---	4.5	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.0	---	2.5	V

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q _g	Total Gate Charge	V _{DS} =30V, V _{GS} =10V, I _D =25A	---	66	---	nC
Q _{gs}	Gate-Source Charge		---	10.7	---	
Q _{gd}	Gate-Drain Charge		---	10.9	---	
T _{d(on)}	Turn-On Delay Time	V _{DS} =30V, V _{GS} =10V, R _G =2Ω, I _D =25A	---	22.5	---	nS
T _r	Rise Time		---	6.7	---	
T _{d(off)}	Turn-Off Delay Time		---	80.3	---	
T _f	Fall Time		---	26.8	---	
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, F=100kHz	---	5377	---	pF
C _{oss}	Output Capacitance		---	1666	---	
C _{rss}	Reverse Transfer Capacitance		---	77.7	---	

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _{GS} <V _{th}	---	---	130	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =20A	---	---	1.3	V

NOTES :

1. Calculated continuous current based on maximum allowable junction temperature.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. V_{DD}=50V, L=0.3mH, R_G=25Ω.
4. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
5. Essentially independent of operating temperature.



Characteristics Curves

FIG. 1-Forward Characteristics of Body Diode

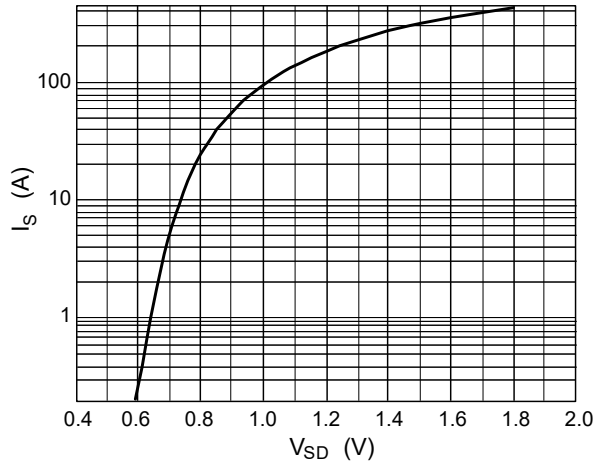


FIG. 2-BV_{DSS} vs T_J

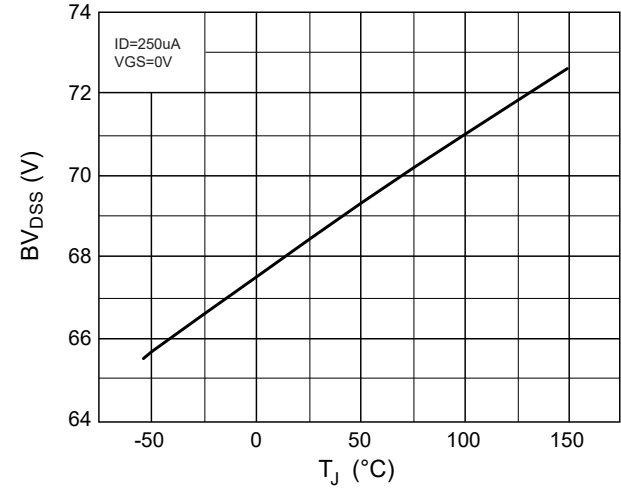


FIG. 2-R_{DS(ON)} vs T_J

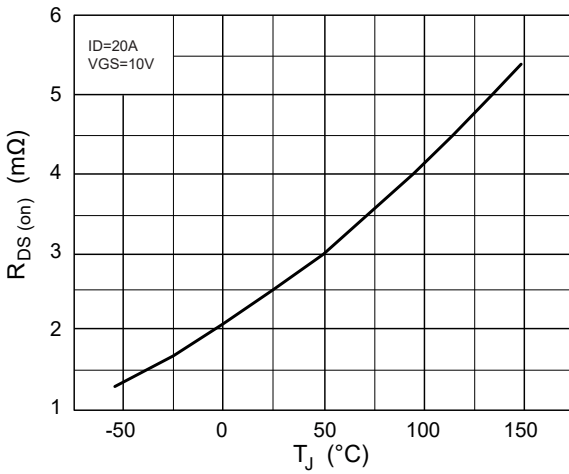


FIG. 4-Gate Charge Characteristics

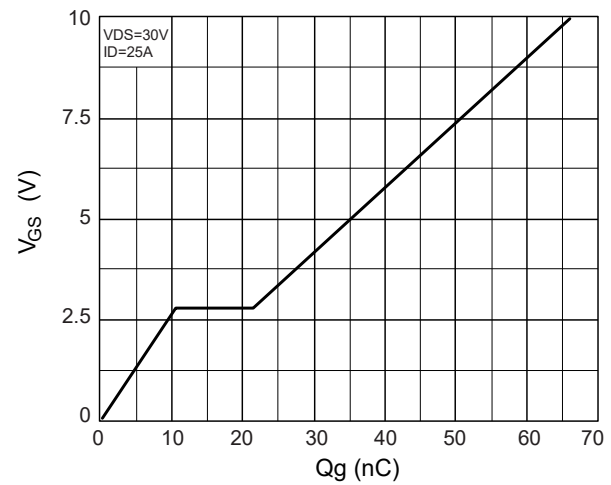


FIG. 5-Safe Operation Area

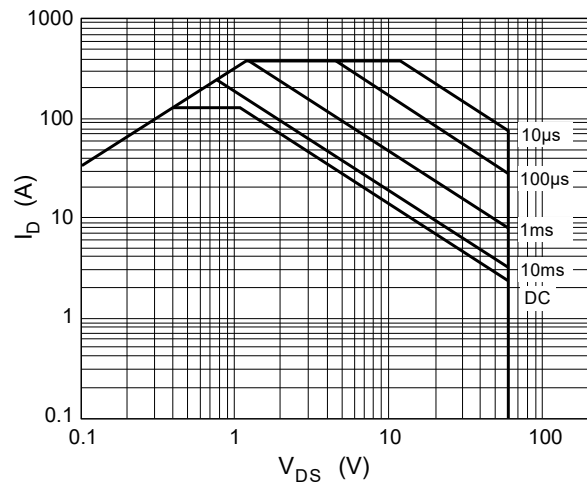
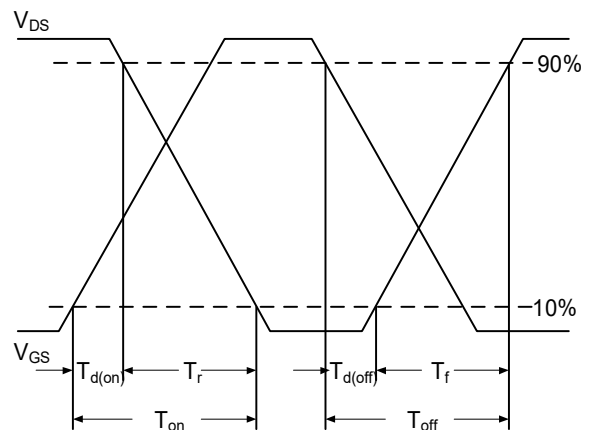


FIG. 6 - Switching Time Waveform



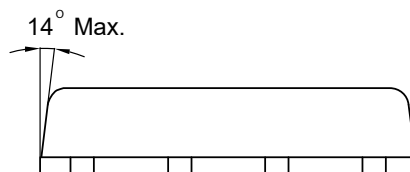
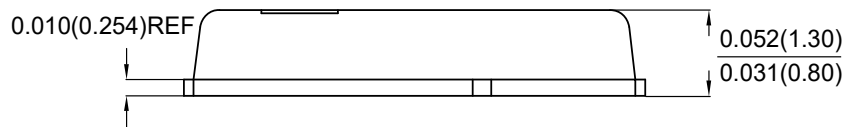
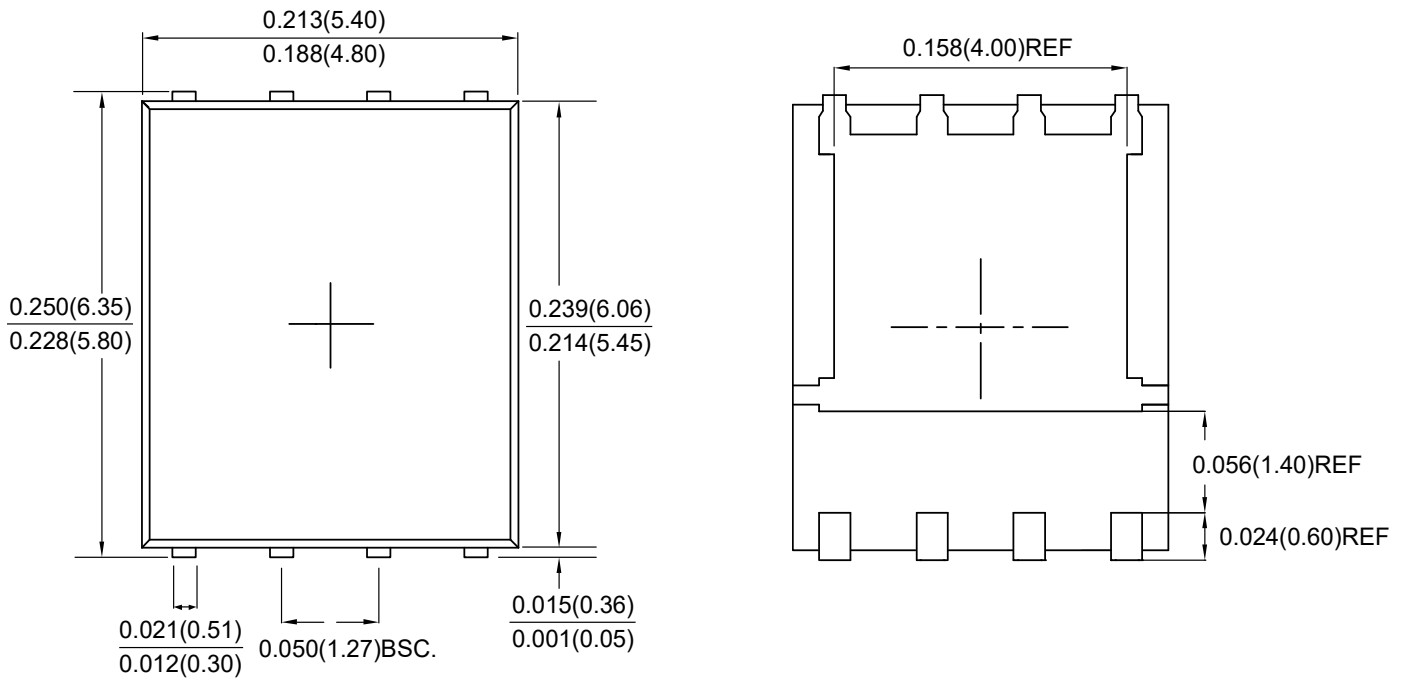


P5MNG3P0



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Package Outline Dimensions



PPAK5X6

Dimensions in inches and (millimeters)



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