



100V N-Channel MOSFETs

General Description

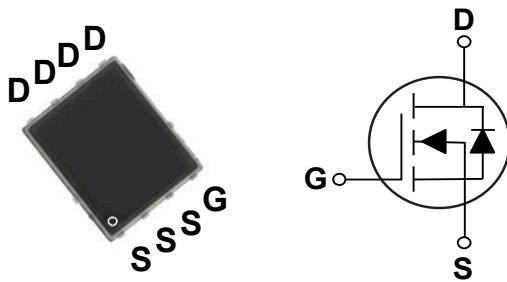
These N-Channel enhancement mode power field effect transistors are using SGT MOSFET technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BV_{DSS}	R_{DS(ON)}	I_D
100 V	6 mΩ	95 A

Features

- $R_{DS(ON)} \leq 6m\Omega @ V_{GS}=10V$
- Fast Switching
- Improved dv/dt Capability
- Green Device Available

PPAK5X6 Pin Configuration



Applications

- Power Management Switches
- DC/DC Converter
- LED Backlighting

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

Symbol	Parameter	Value	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current - Continuous ($T_c=25^\circ C$)	95	A
I_{DM}	Drain Current - Pulsed (NOTE 1)	380	A
EAS	Single Pulse Avalanche Energy (NOTE 2)	245	mJ
P_D	Power Dissipation ($T_c=25^\circ C$)	113.6	W
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
Marking Code		NM6P0A	

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	60	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction to Case	1.1	$^\circ C/W$



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 =250μA	100	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =100V, V _{GS} =0V	---	---	1	μA
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	---	---	6	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250μA	2	---	4	V
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =20A	---	58	---	S

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q _g	Total Gate Charge	V _{DS} =50V, V _{GS} =10V, I _D =20A	---	81.8	---	nC
Q _{gs}	Gate-Source Charge		---	23.5	---	
Q _{gd}	Gate-Drain Charge		---	22.5	---	
T _{d(on)}	Turn-On Delay Time	V _{DS} =50V, V _{GS} =10V, R _G =3Ω, I _D =20A	---	15.4	---	nS
T _r	Rise Time		---	13	---	
T _{d(off)}	Turn-Off Delay Time		---	34	---	
T _f	Fall Time		---	6.2	---	
C _{iss}	Input Capacitance	V _{DS} =50V, V _{GS} =0V, F=1MHz	---	5518	---	pF
C _{oss}	Output Capacitance		---	655	---	
C _{rss}	Reverse Transfer Capacitance		---	23	---	
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz	---	1.4	---	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	---	---	95	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =20A	---	---	1.2	V
t _{rr}	Body Diode Reverse Recovery Time	I _F =20A, di/dt=100A/us	---	55	---	nS
Q _{rr}	Body Diode Reverse Recovery Charge		---	101	---	nC

NOTES :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=50V, V_{GS}=10V, L=0.4mH, I_{AS}=35A.
3. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
4. The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.



Characteristics Curves

FIG. 1-Transfer Characteristics

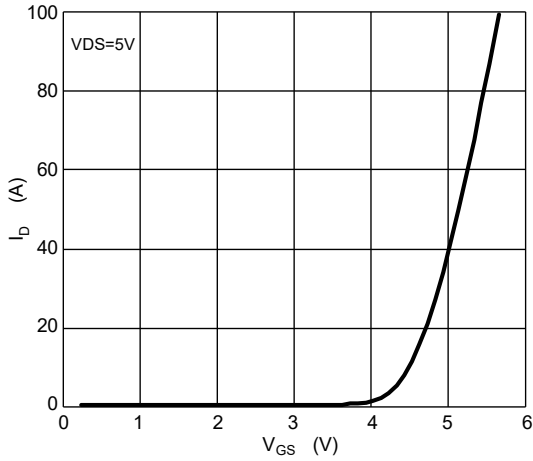


FIG. 2-Is vs VSD

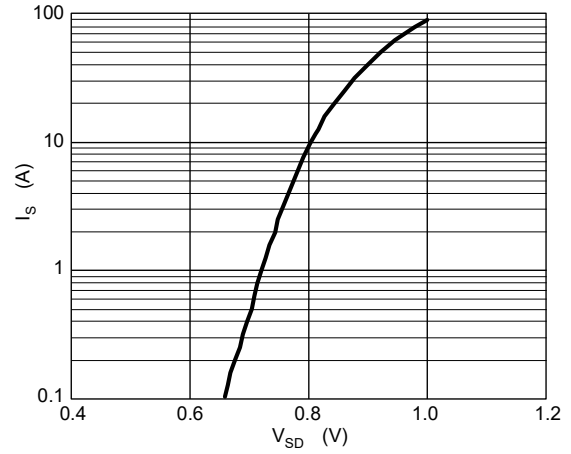


FIG. 3-RDS(on) vs Id

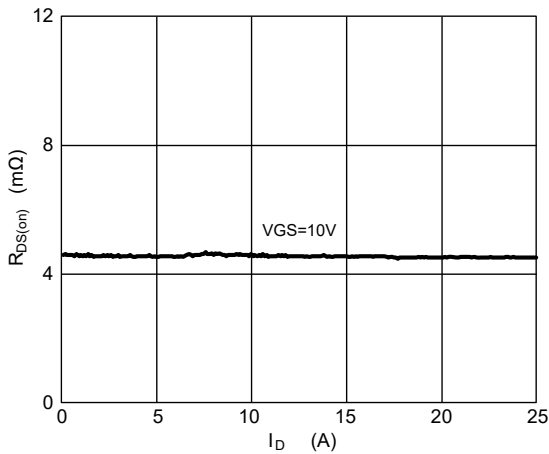


FIG. 4-Normalized RDS(on) vs Tj

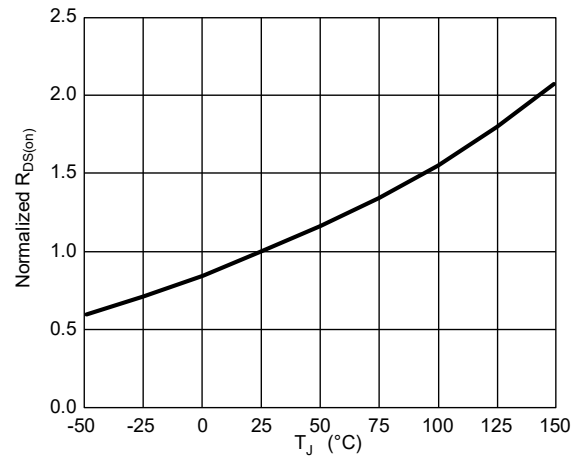


FIG. 5-Gate Charge Characteristics

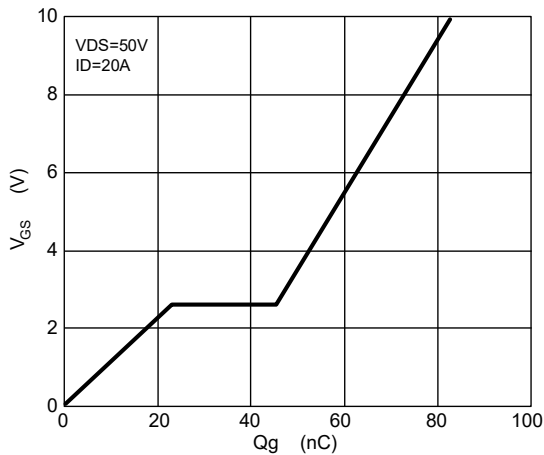
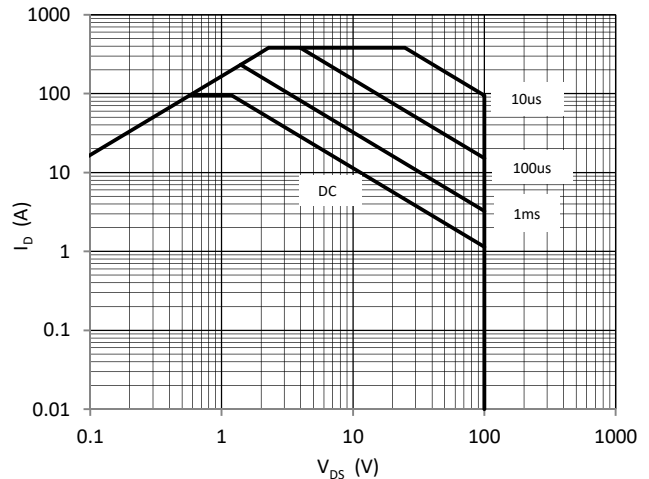


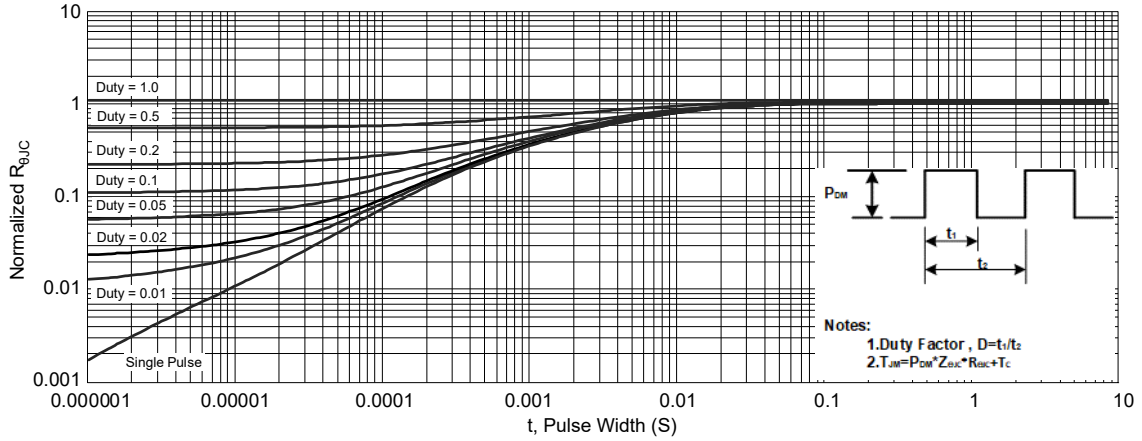
FIG. 6-Safe Operating Area



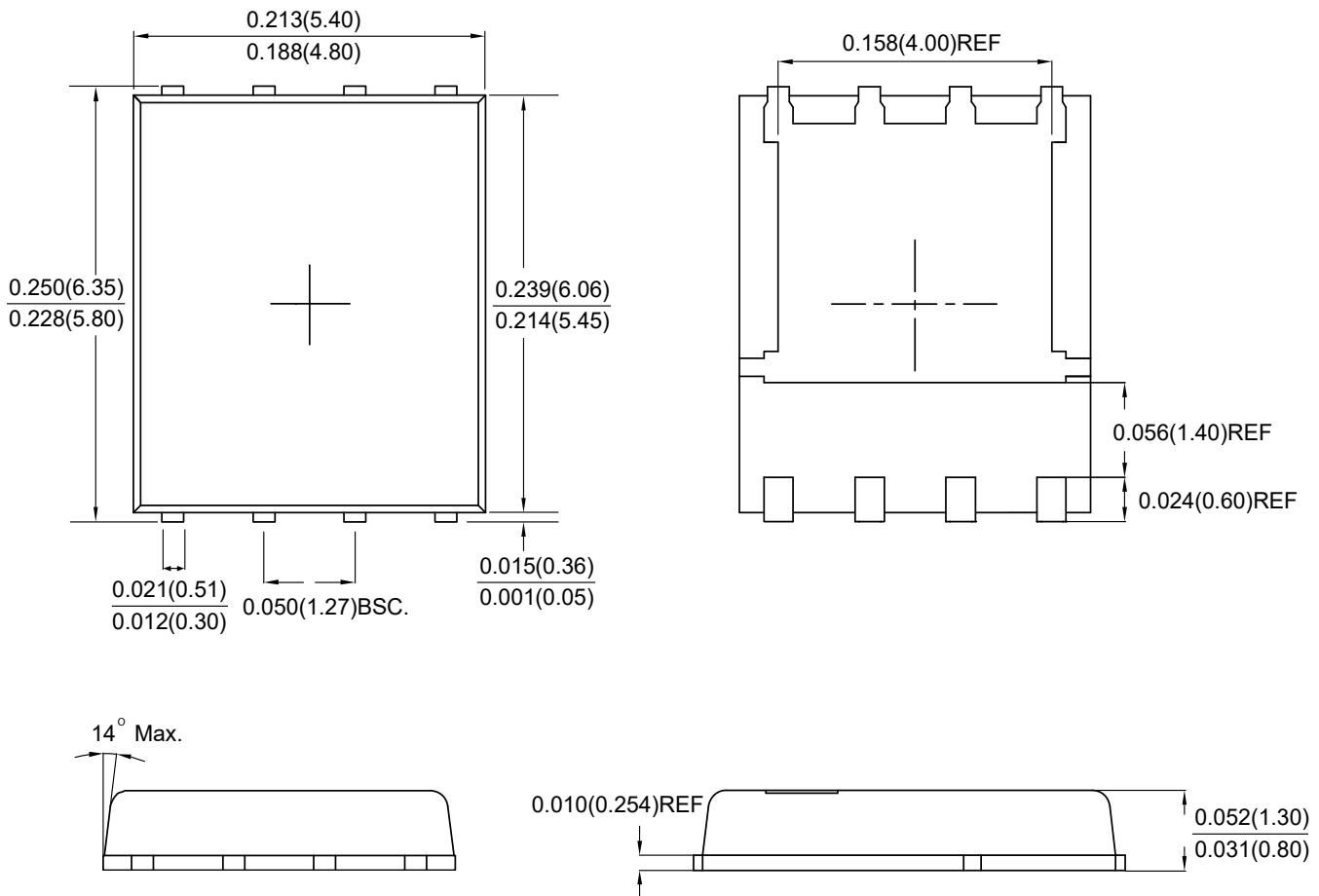


Characteristics Curves

FIG. 7-Transient Thermal Impedance



Package Outline Dimensions



PPAK5X6

Dimensions in inches and (millimeters)



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