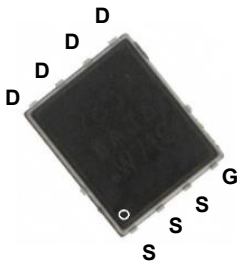
GOOD-ARK SEMICONDUCTOR

GSGP2R403

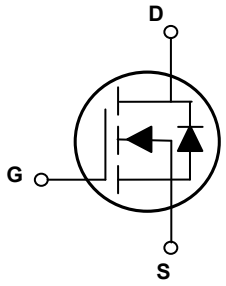
30V N-Channel MOSFET

Main Product Characteristics

BV_{DSS}	30V
$R_{DS(ON)}$	2.4mΩ (Max)
I_D	100A



PPAK5x6



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for high efficiency switched mode power supplies
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery

Description

The GSGP2R403 utilizes the latest techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supplies and a wide variety of other applications.

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous, @ Steady-State (T_C=25°C)	I_D	100	A
Drain Current-Continuous, @ Steady-State (T_C=100°C)		63	
Drain Current-Pulsed (T_C=25°C)[1]	I_{DM}	400	A
Single Pulse Avalanche Energy	E_{AS}	101	mJ
Single Pulse Current	I_{AS}	45	A
Power Dissipation (T_C=25°C)[2]	P_D	69	W
Thermal Resistance, Junction-to-Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	50	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.8	°C/W
Operating Junction Temperature Range	T_J	-55 To +150	°C
Storage Temperature Range	T_{STG}	-55 To +150	°C
Soldering Temperature (SMD)	T_{sold}	260	°C

Electrical Characteristics (T_A=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250uA	30	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V, T_J=25°C	-	-	1.0	μA
		V_{DS}=30V, V_{GS}=0V, T_J=125°C	-	2.0	-	μA
Gate-Source Forward Leakage	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=22.5A	-	2.0	2.4	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250uA	1.0	-	2.2	V
Dynamic and Switching Characteristics						
Total Gate Charge[3,4]	Q_g	V_{DD}=15V, I_D=20A, V_{GS}=10V	-	39	-	nC
Gate-Source Charge[3,4]	Q_{gs}		-	11	-	
Gate-Drain ("Miller") Charge[3,4]	Q_{gd}		-	3.4	-	
Gate to Plateau[3,4]	$V_{plateau}$		-	3.7	-	V
Turn-On Delay Time[3,4]	$t_{d(on)}$	V_{DD}=20V, R_G=3.0Ω, V_{GS}=10V, I_D=20A	-	10	-	nS
Rise Time[3,4]	t_r		-	63	-	
Turn-Off Delay Time[3,4]	$t_{d(off)}$		-	45	-	
Fall Time[3,4]	t_f		-	28	-	
Input Capacitance	C_{lss}	V_{DS}=15V, V_{GS}=0V, F=1MHz	-	2566	-	pF
Output Capacitance	C_{oss}		-	1419	-	
Reverse Transfer Capacitance	C_{rss}		-	111	-	
Gate Resistance	R_g	F=1MHz	-	2.5	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	100	A
Pulsed Source Current	$I_{S.pulse}$		-	-	400	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=45A	-	-	1.4	V
Reverse Recovery Time[3]	t_{rr}	V_{GS}=0V, V_R=30V, I_S=20A, di/dt=100A/μs	-	42	-	nS
Reverse Recovery Charge[3]	Q_{rr}		-	25	-	nC

Note:

1. Pulse time of 5us, pulse width limited by maximum junction temperature.
2. The dissipated power value will change with the temperature. When it is greater than 25°C, the dissipated power value will decrease by 0.55°C/W for every 1 degree of temperature increase.
3. Pulse test: Pulse width ≤ 300us, duty cycle ≤ 2%.
4. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

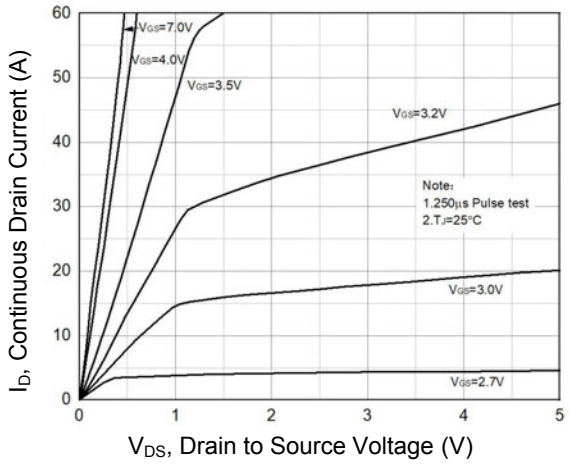


Figure 1. Typical Output Characteristics

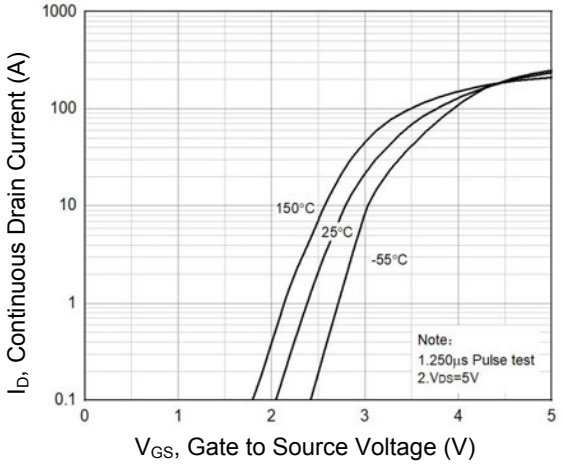


Figure 2. Transfer Characteristics

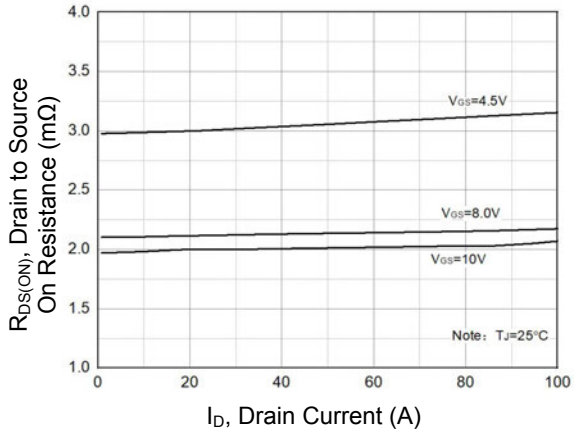


Figure 3. $R_{DS(ON)}$ vs. Drain Current

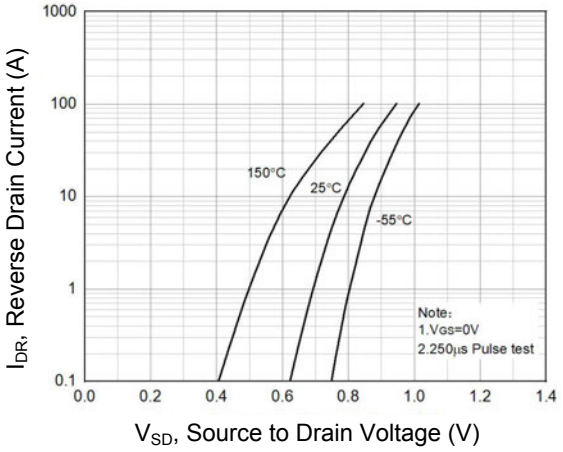


Figure 4. Body Diode Characteristics

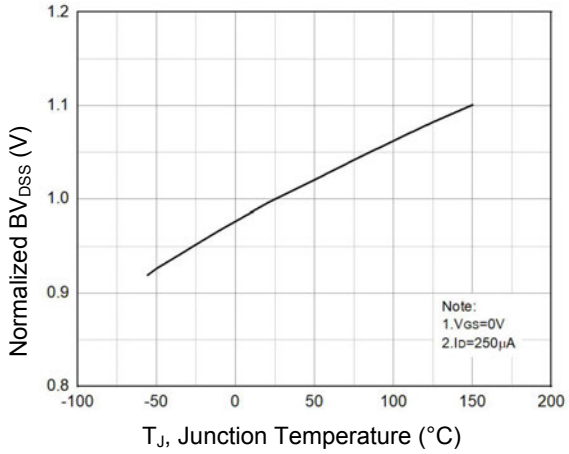


Figure 5. Normalized BV_{DSS} vs. T_J

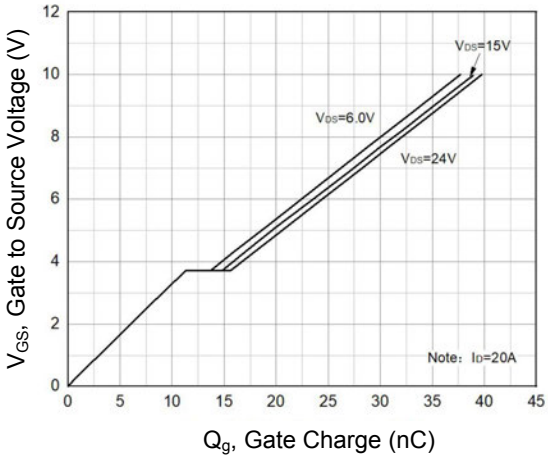


Figure 6. Gate Charge Characteristics

Typical Electrical and Thermal Characteristic Curves

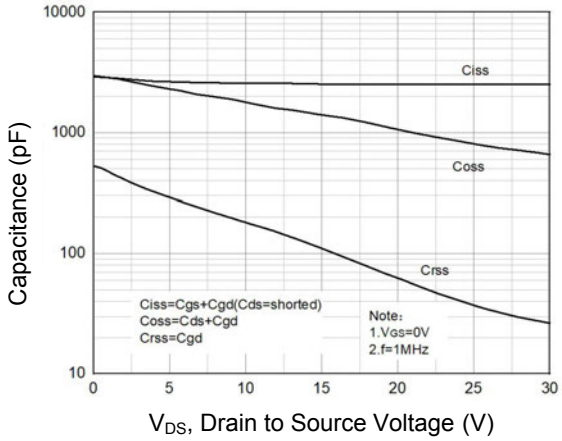


Figure 7. Capacitance Characteristics

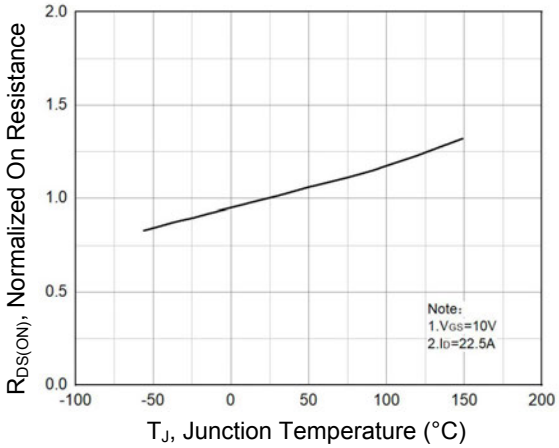


Figure 8. Normalized $R_{DS(ON)}$ vs. T_J

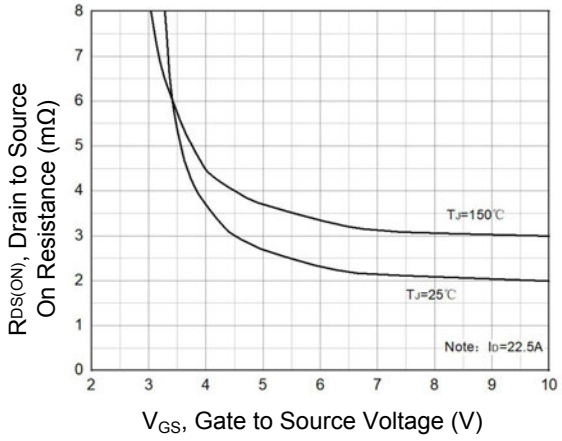


Figure 9. Normalized $R_{DS(ON)}$ vs. V_{GS}

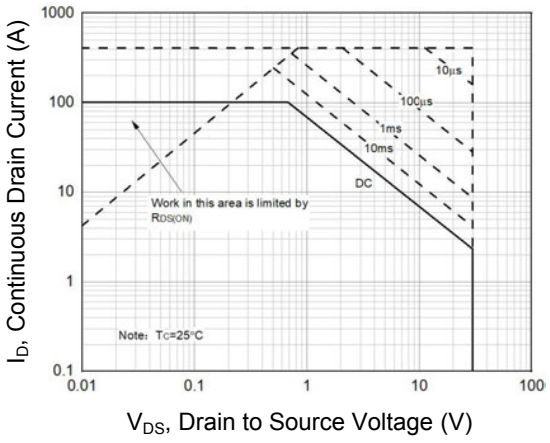


Figure 10. Maximum Safe Operation Area

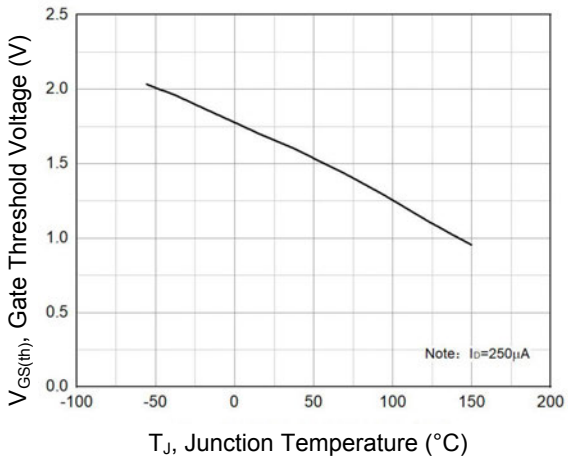


Figure 11. Gate Threshold Voltage vs. T_J

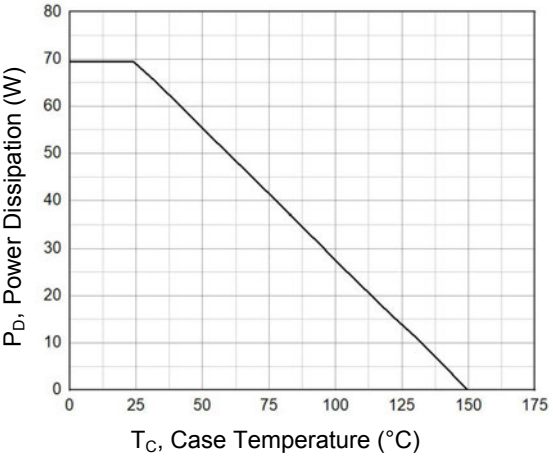
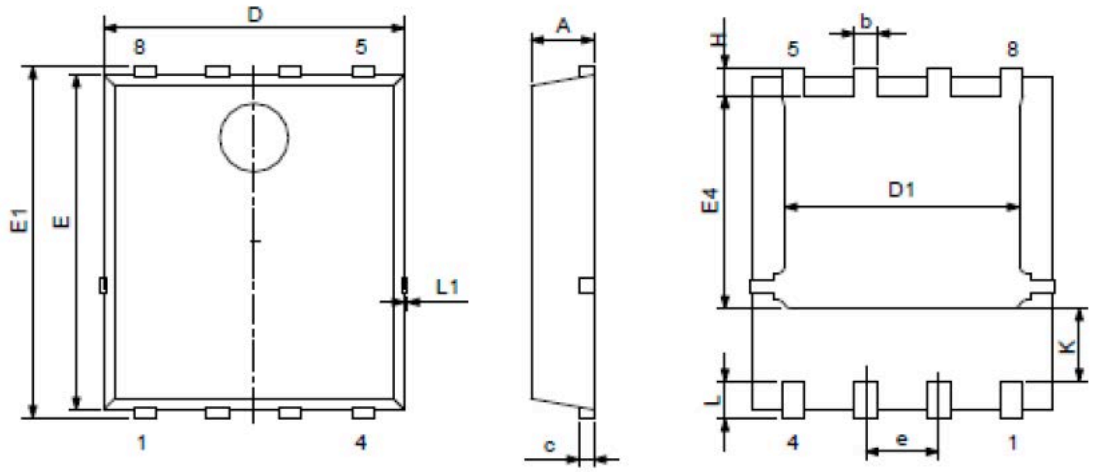


Figure 12. Power Dissipation vs. T_C

Package Outline Dimensions (PPAK5x6)



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	0.900	1.200	0.035	0.047
c	0.154	0.354	0.006	0.014
D	4.800	5.400	0.190	0.213
E	5.660	6.060	0.223	0.240
D1	3.760	4.300	0.148	0.169
E1	5.900	6.350	0.232	0.250
b	0.300	0.550	0.012	0.022
k	1.100	1.500	0.043	0.059
e	1.070	1.370	0.042	0.054
E4	3.340	3.920	0.131	0.154
L	0.300	0.710	0.012	0.028
L1	-	0.120	-	0.005
H	0.400	0.710	0.016	0.028