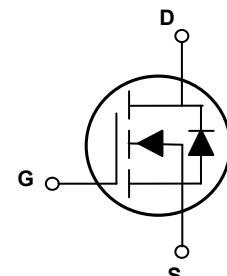
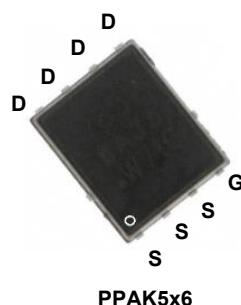


Main Product Characteristics

BV _{DSS}	30V
R _{DS(ON)}	1.1mΩ (Max)
I _D	100A



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 GSGP1R103 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)		100	
Drain Current-Pulsed (T _C =25°C) ¹	I _{DM}	400	A
Single Pulse Avalanche Energy	E _{AS}	156	mJ
Single Pulse Avalanche Current	I _{AS}	56	A
Power Dissipation (T _C =25°C) ²	P _D	93	W
Thermal Resistance, Junction-to-Ambient (PCB Mounted, Steady-State)	R _{θJA}	50	°C/W
Thermal Resistance, Junction-to-Case	R _{θJC}	1.35	°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 ($T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{\text{GS}}=0\text{V}, I_{\text{D}}=250\mu\text{A}$	30	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{\text{DS}}=30\text{V}, V_{\text{GS}}=0\text{V}, T_J=25^\circ\text{C}$	-	-	1.0	μA
		$V_{\text{DS}}=30\text{V}, V_{\text{GS}}=0\text{V}, T_J=125^\circ\text{C}$	-	2.0	-	μA
Gate-Source Forward Current	I_{GSS}	$V_{\text{GS}}=\pm 20\text{V}, V_{\text{DS}}=0\text{V}$	-	-	± 100	nA
Static Drain-Source On-Resistance	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}}=10\text{V}, I_{\text{D}}=30\text{A}$	-	0.8	1.1	$\text{m}\Omega$
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{GS}}=V_{\text{DS}}, I_{\text{D}}=250\mu\text{A}$	1.1	-	2.3	V
Dynamic and Switching Characteristics						
Total Gate Charge ^{3,4}	Q_g	$V_{\text{DD}}=15\text{V}, I_{\text{D}}=30\text{A}, V_{\text{GS}}=4.5\text{V}$	-	40	-	nC
Gate-Source Charge ^{3,4}	Q_{gs}		-	24	-	
Gate-Drain ("Miller") Charge ^{3,4}	Q_{gd}		-	9.9	-	
Gate to Plateau ^{3,4}	V_{plateau}		-	3.8	-	
Turn-On Delay Time ^{3,4}	$t_{\text{d}(\text{on})}$	$V_{\text{DD}}=20\text{V}, R_{\text{G}}=3\Omega, V_{\text{GS}}=4.5\text{V}, I_{\text{D}}=15\text{A}$	-	44	-	nS
Rise Time ^{3,4}	t_r		-	79	-	
Turn-Off Delay Time ^{3,4}	$t_{\text{d}(\text{off})}$		-	51	-	
Fall Time ^{3,4}	t_f		-	32	-	
Input Capacitance	C_{iss}	$V_{\text{DS}}=15\text{V}, V_{\text{GS}}=0\text{V}, F=1\text{MHz}$	-	5900	-	pF
Output Capacitance	C_{oss}		-	3214	-	
Reverse Transfer Capacitance	C_{rss}		-	204	-	
Gate Resistance	R_g	$F=1\text{MHz}$	-	1.3	-	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	$I_{\text{s,pulse}}$		-	-	400	A
Diode Forward Voltage	V_{SD}	$V_{\text{GS}}=0\text{V}, I_{\text{s}}=10\text{A}$	-	-	1.4	V
Reverse Recovery Time ³	t_{rr}	$V_{\text{GS}}=0\text{V}, V_R=30\text{V}, I_{\text{s}}=30\text{A}, dI/dt=100\text{A}/\mu\text{s}$	-	66	-	nS
Reverse Recovery Charge ³	Q_{rr}		-	88	-	nC

Note:

1. Pulse time of 5 μs .
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 $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.
4. Basically unaffected by operating temperature.

Typical Electrical and Thermal Characteristic Curves

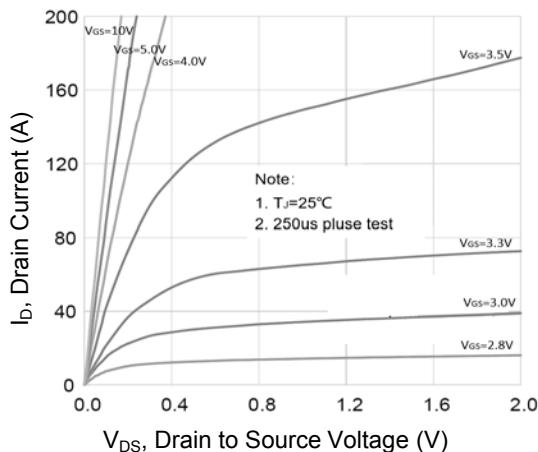


Figure 1. Typical Output Characteristics

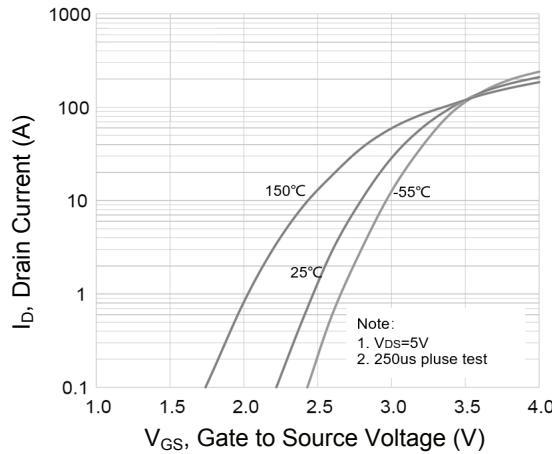


Figure 2. Transfer Characteristics

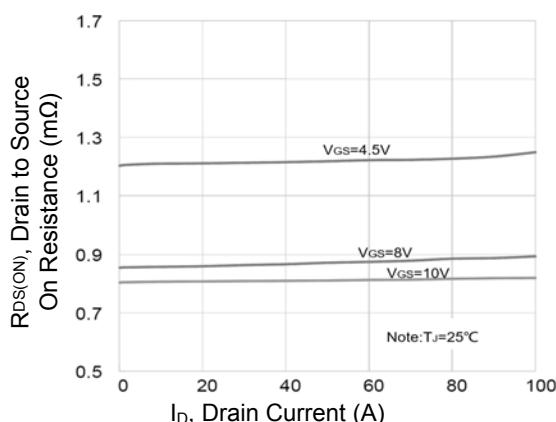


Figure 3. $R_{DS(\text{ON})}$ vs. Drain Current

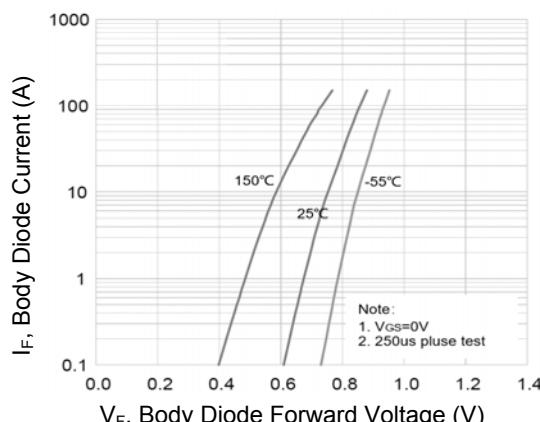


Figure 4. Body Diode Characteristics

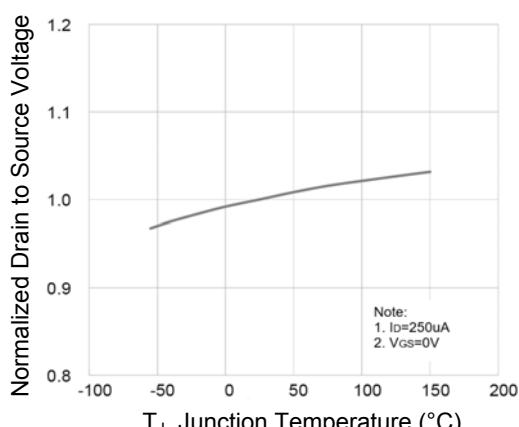


Figure 5. Normalized BV_{DSS} vs. T_J

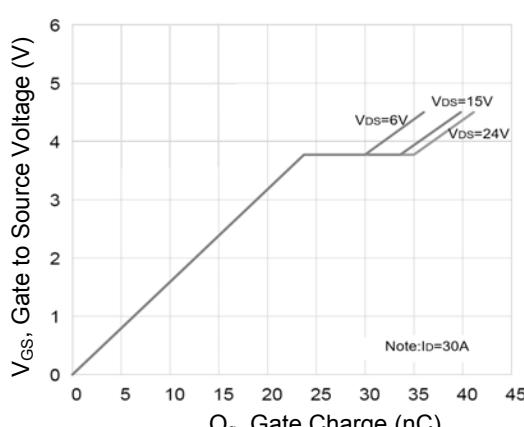


Figure 6. Gate Charge Characteristics

Typical Electrical and Thermal Characteristic Curves

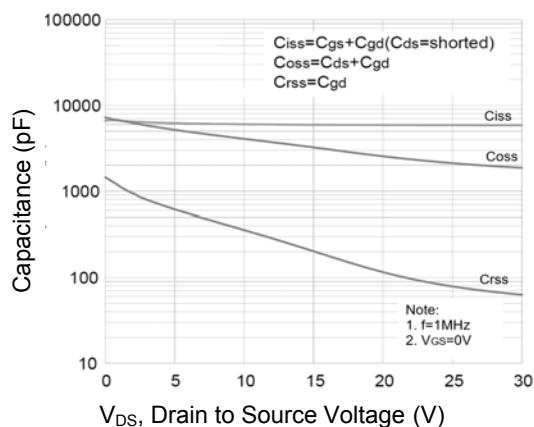


Figure 7. Capacitance Characteristics

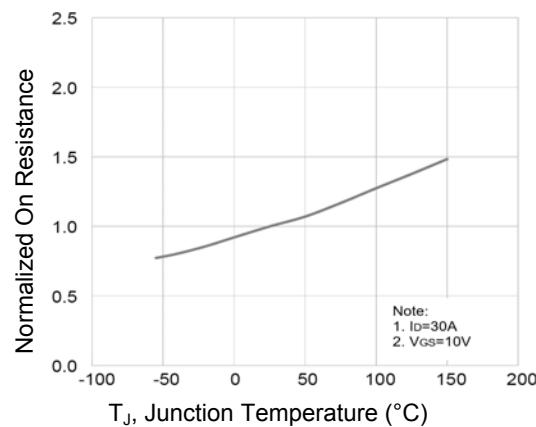


Figure 8. Normalized $R_{DS(ON)}$ vs. T_J

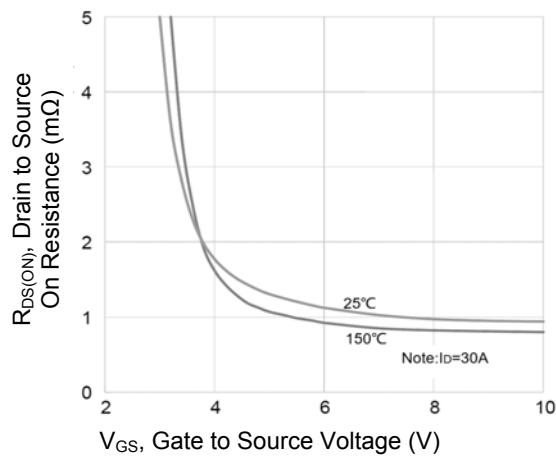


Figure 9. Normalized $R_{DS(ON)}$ vs. V_{GS}

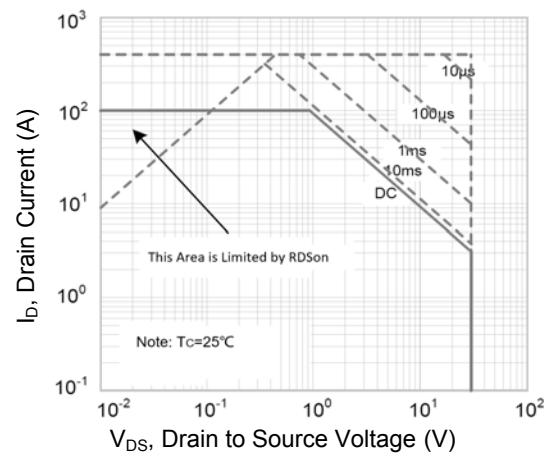
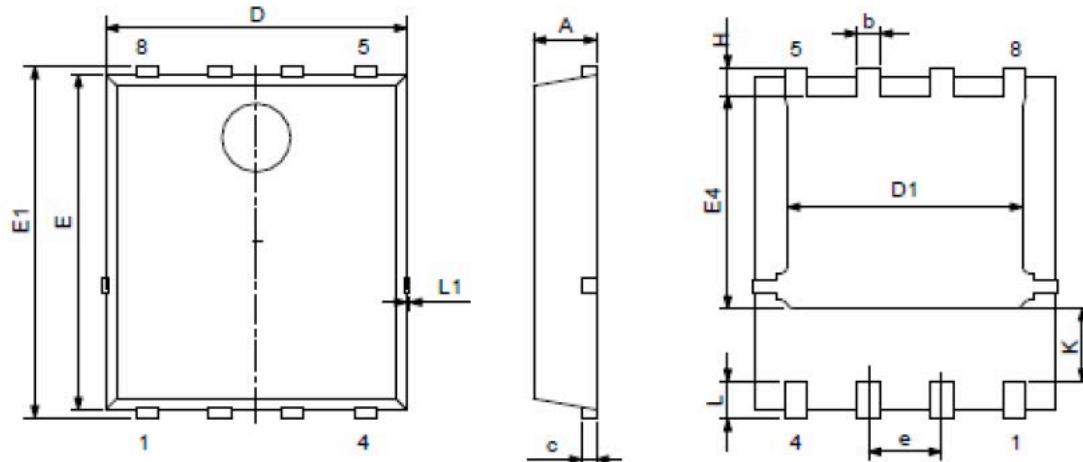


Figure 10. Safe Operation Area

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	0.189	0.213
E	5.660	6.060	0.223	0.239
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