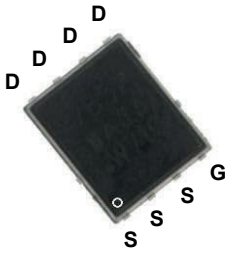
GOOD-ARK SEMICONDUCTOR

GSGP4R303

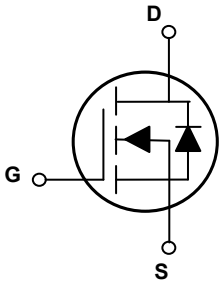
30V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	30V
$R_{DS(ON)}$	3.45mΩ (Typ.)
I_D	70A



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 GSGP4R303 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_C=25°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-to-Source Voltage	V_{GS}	±20	V
Continuous Drain Current, @ Steady-State (T_C=25°C)[1]	I_D	70	A
Continuous Drain Current, @ Steady-State (T_C=100°C)		44	A
Pulsed Drain Current[2]	I_{DM}	280	A
Power Dissipation (T_C=25°C)	P_D	35	W
Linear Derating Factor (T_C=25°C)		1.4	W/°C
Single Pulse Avalanche Energy[3]	E_{AS}	36	mJ
Junction-to-Case	$R_{\theta JC}$	3.57	°C/W
Junction-to-Ambient (PCB Mounted, Steady-State)[4]	$R_{\theta JA}$	59.0	°C/W
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +150	°C

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	30	-	-	V
Drain-to-Source Leakage Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V, T_J=25°C	-	-	1	μA
		T_J=125°C	-	0.5	-	
Gate-to-Source Forward Leakage	I_{GSS}	V_{GS}=20V	-	-	100	nA
		V_{GS}=-20V	-	-	-100	
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=25A	-	3.45	4.3	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1.15	-	2.15	V
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=15V, f=1MHz	-	1073	-	pF
Output Capacitance	C_{oss}		-	651	-	
Reverse Transfer Capacitance	C_{rss}		-	57	-	
Total Gate Charge	Q_g	I_D=25A, V_{DD}=15V, V_{GS}=4.5V	-	9.6	-	nC
Gate-to-Source Charge	Q_{gs}		-	4.6	-	
Gate-to-Drain ("Miller") Charge	Q_{gd}		-	3.0	-	
Turn-on Delay Time	$t_{d(on)}$	V_{GS}=4.5V, V_{DD}=20V, I_D=25A, R_{GEN}=5Ω	-	10	-	nS
Rise Time	t_r		-	44	-	
Turn-Off Delay Time	$t_{d(off)}$		-	15	-	
Fall Time	t_f		-	13	-	
Gate Resistance	R_g	f=1MHz	-	1.0	-	Ω
Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	70	A
Pulsed Source Current (Body Diode)	I_{SM}		-	-	280	A
Diode Forward Voltage	V_{SD}	I_S=15A, V_{GS}=0V	-	-	1.4	V
Reverse Recovery Time	T_{rr}	I_S=25A, V_{GS}=0V, V_R=30V di/dt=100A/μs	-	28	-	nS
Reverse Recovery Charge	Q_{rr}		-	18	-	nC

Note:

1. Pulse test: Pulse width ≤ 300us, duty cycle ≤ 2%.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. L=0.5mH, R_G=10Ω, V_{DD}=50V, T_J=25°C.
4. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Typical Electrical and Thermal Characteristic Curves

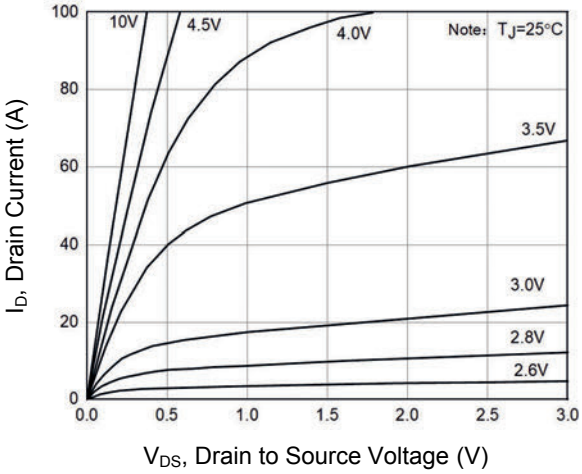


Figure 1. Output Characteristics

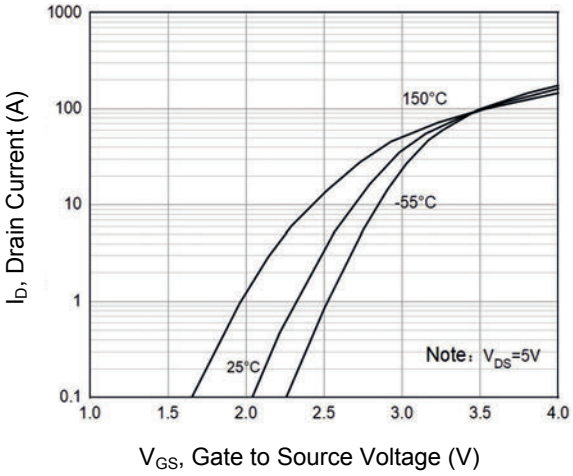


Figure 2. Transfer Characteristics

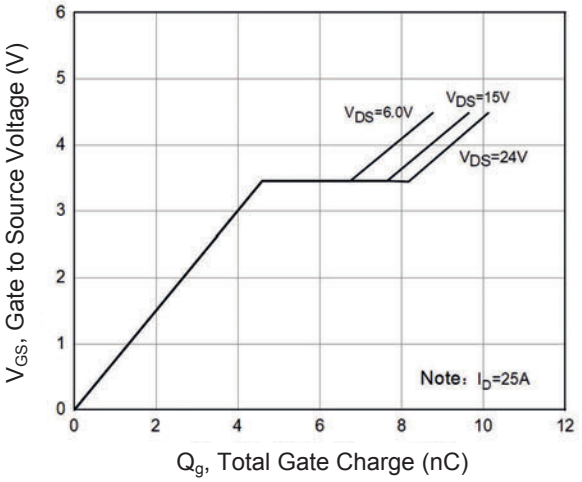


Figure 3. Gate Charge

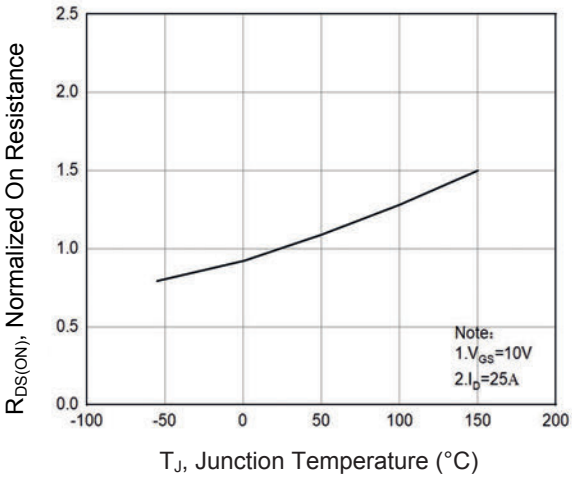


Figure 4. Normalized $R_{DS(ON)}$ vs. T_J

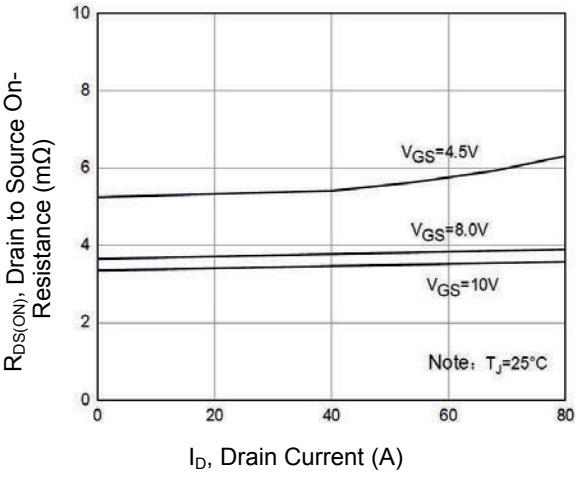


Figure 5. $R_{DS(ON)}$ vs. Drain Current

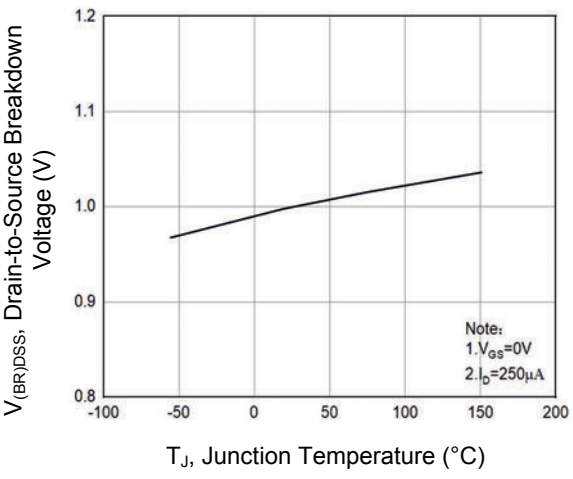


Figure 6. Normalized BV_{DSS} vs. T_J

Typical Electrical and Thermal Characteristic Curves

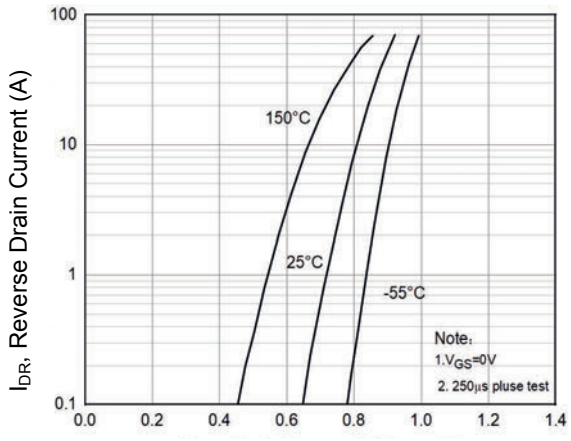


Figure 7. Body Diode Characteristics

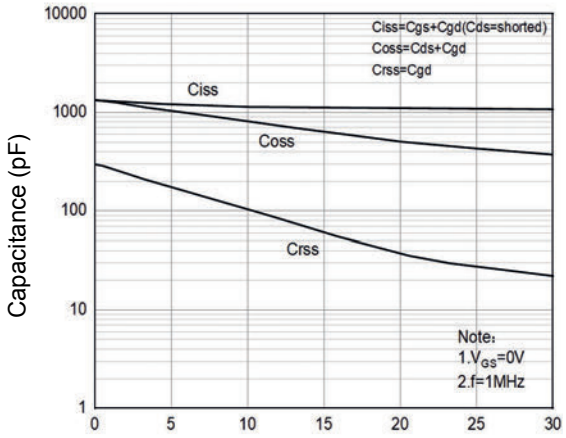


Figure 8. Transfer Characteristics

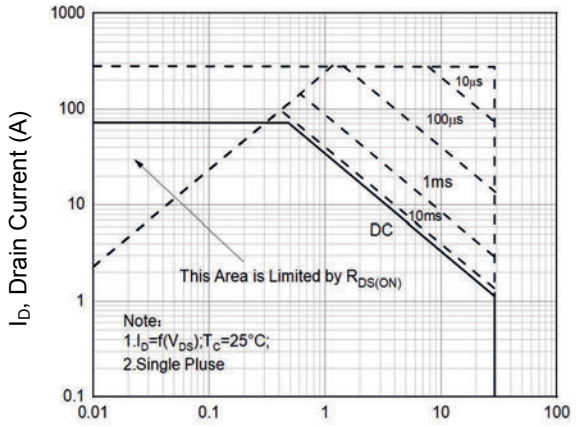


Figure 9. Safe Operation Area

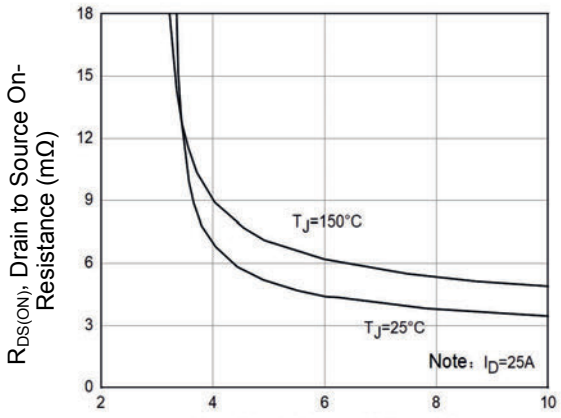


Figure 10. R_{DSON} vs. V_{GS}

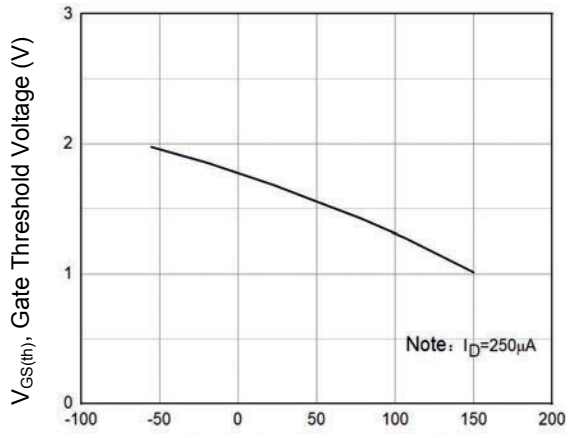


Figure 11. $V_{GS(th)}$ vs. T_J

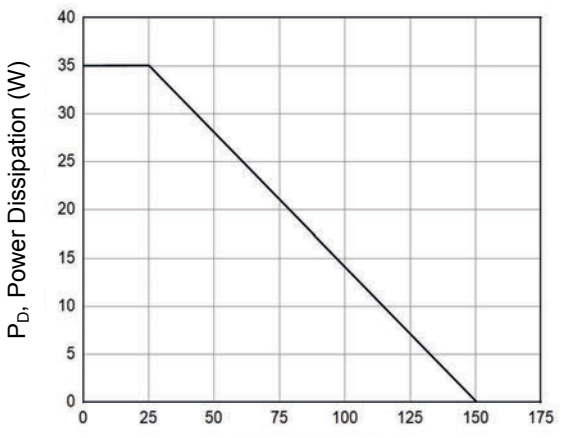


Figure 12. Power Dissipation vs. T_C

Typical Electrical and Thermal Characteristic Curves

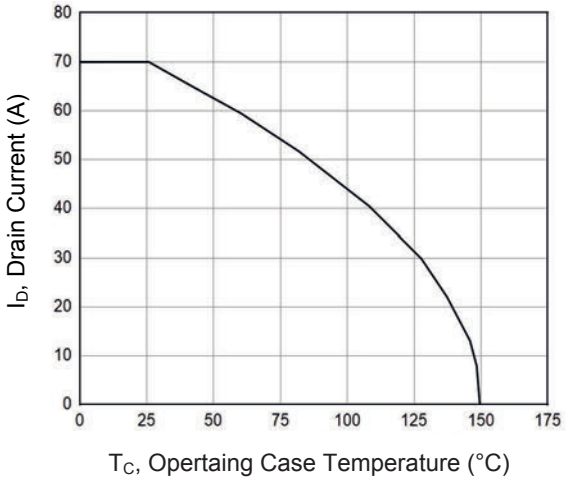


Figure 13. Drain Current vs. T_C

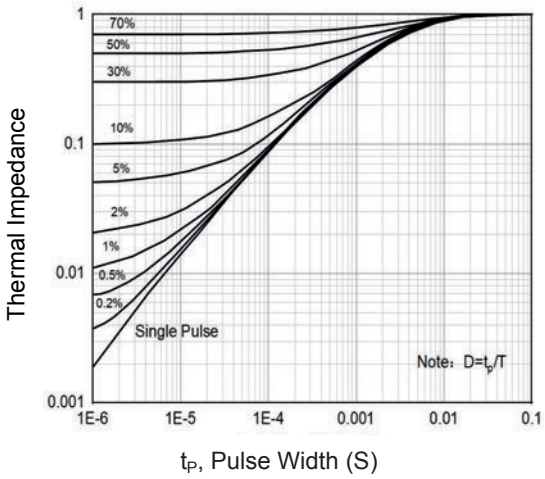
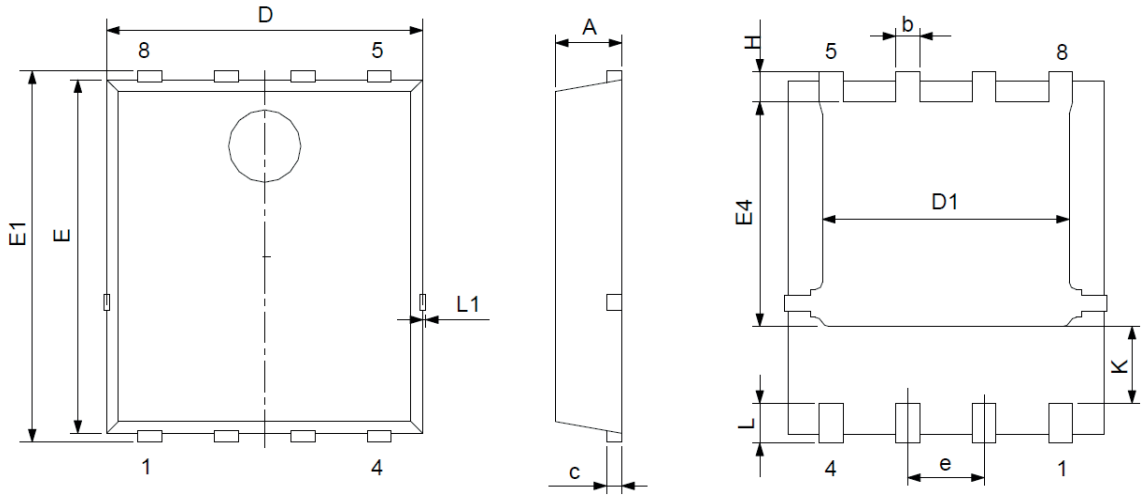


Figure 14. Thermal Impedance vs. t_P

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

Order information

Device	Package	Reel size	Carrier	Quantity
GSGP4R303	PPAK5x6	P4R303	Tape & Reel	5,000 pcs / Reel