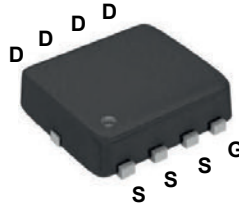
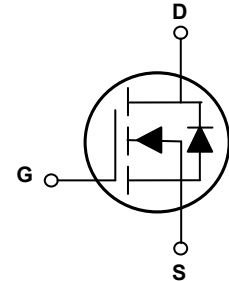


### Main Product Characteristics

$V_{(BR)DSS}$	30V
$R_{DS(ON)}$	3.5m $\Omega$ (Typ.)
$I_D$	70A



PPAK3x3



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 GSGN4R303 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<sub>c</sub>=25°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V <sub>DS</sub>	30	V
Gate-to-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current, @ Steady-State (T <sub>c</sub> =25°C) <sup>1</sup>	I <sub>D</sub>	70	A
Continuous Drain Current, @ Steady-State (T <sub>c</sub> =100°C)		44	A
Pulsed Drain Current <sup>2</sup>	I <sub>DM</sub>	280	A
Power Dissipation (T <sub>c</sub> =25°C)	P <sub>D</sub>	35	W
Linear Derating Factor (T <sub>c</sub> =25°C)		1.4	W/°C
Single Pulse Avalanche Energy <sup>3</sup>	E <sub>AS</sub>	36	mJ
Junction-to-Case	R <sub>θJC</sub>	3.57	°C/W
Junction-to-Ambient (PCB Mounted, Steady-State) <sup>4</sup>	R <sub>θJA</sub>	59.0	°C/W
Operating Junction and Storage Temperature Range	T <sub>J</sub> /T <sub>STG</sub>	-55 to +150	°C

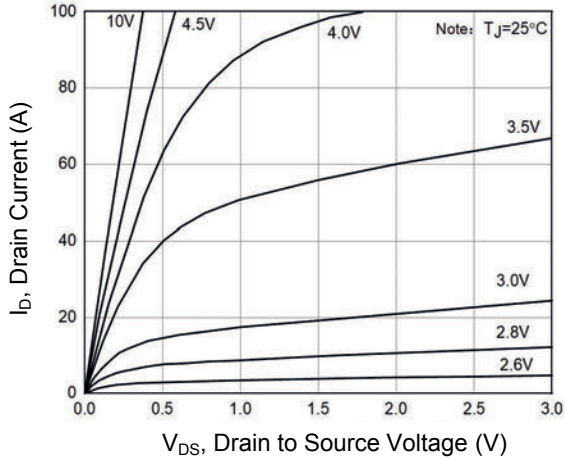
**Electrical Characteristics** ( $T_J=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On / Off Characteristics</b>						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
Drain-to-Source Leakage Current	$I_{DSS}$	$V_{DS}=30V, V_{GS}=0V, T_J=25^\circ\text{C}$	-	-	1	$\mu A$
		$T_J=125^\circ\text{C}$	-	0.5	-	
Gate-to-Source Forward Leakage	$I_{GSS}$	$V_{GS}=20V$	-	-	100	nA
		$V_{GS}=-20V$	-	-	-100	
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=25A$	-	3.5	4.3	m $\Omega$
		$V_{GS}=4.5V, I_D=10A$	-	5.3	6.8	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.1	-	2.8	V
<b>Dynamic and Switching Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{GS}=0V, V_{DS}=15V, f=1\text{MHz}$	-	1073	-	$\mu F$
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	$t_{d(on)}$	$V_{GS}=4.5V, V_{DD}=20V, I_D=25A, R_{GEN}=5\Omega$	-	10	-	nS
Rise Time	$t_r$		-	44	-	
Turn-Off Delay Time	$t_{d(off)}$		-	15	-	
Fall Time	$t_f$		-	13	-	
Gate Resistance	$R_g$	$f=1\text{MHz}$	-	1.1	-	$\Omega$
<b>Source-Drain Ratings and Characteristics</b>						
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	$V_{SD}$	$I_S=10A, V_{GS}=0V$	-	-	1.4	V
Reverse Recovery Time	$T_{rr}$	$I_S=25A, V_{GS}=0V, V_R=30V$ $di/dt=100A/\mu s$	-	28	-	nS
Reverse Recovery Charge	$Q_{rr}$		-	18	-	nC

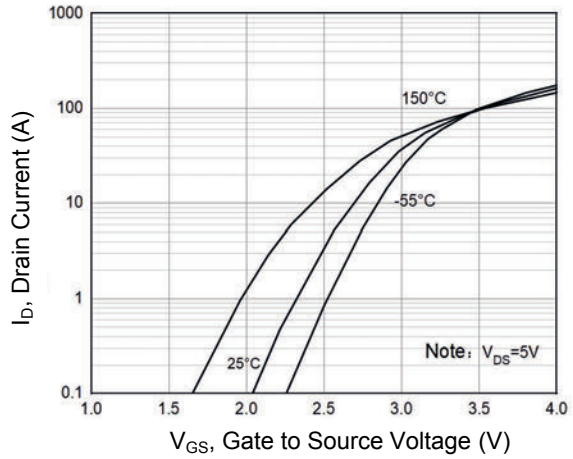
Notes:

1. Pulse test: Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
2. Repetitive rating; pulse width limited by max. junction temperature.
3.  $L=0.5\text{mH}, R_G=10\Omega, V_{DD}=50V, T_J=25^\circ\text{C}$ .
4. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

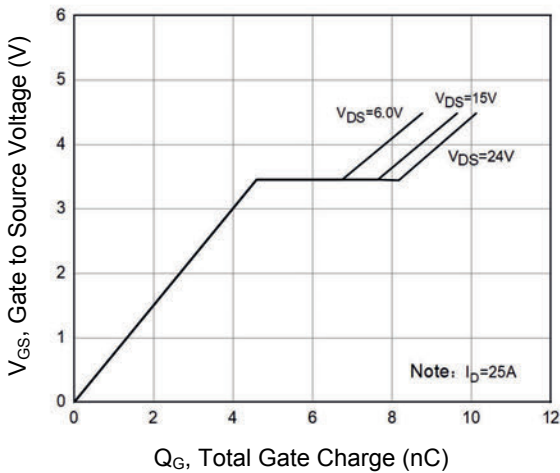
**Typical Electrical and Thermal Characteristic Curves**



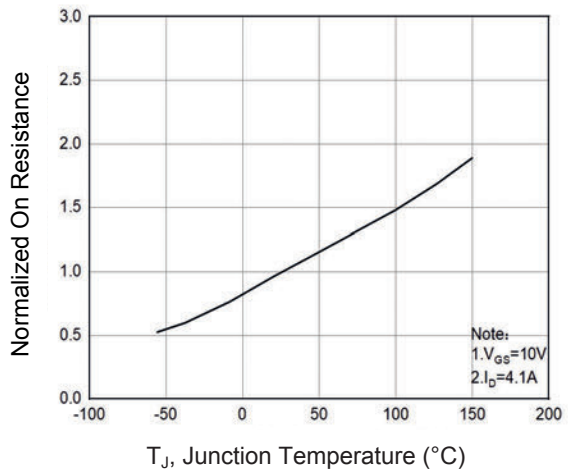
**Figure 1. Output Characteristics**



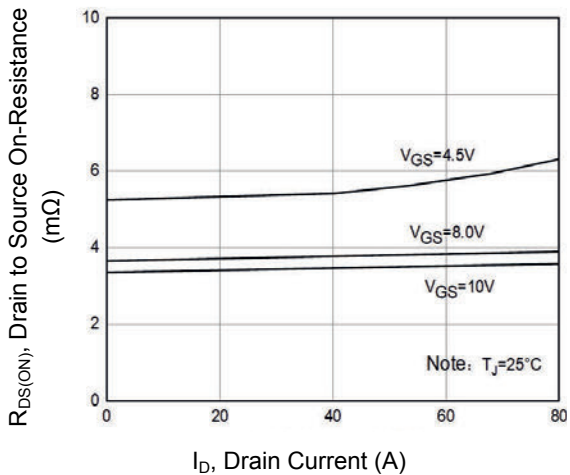
**Figure 2. Transfer Characteristics**



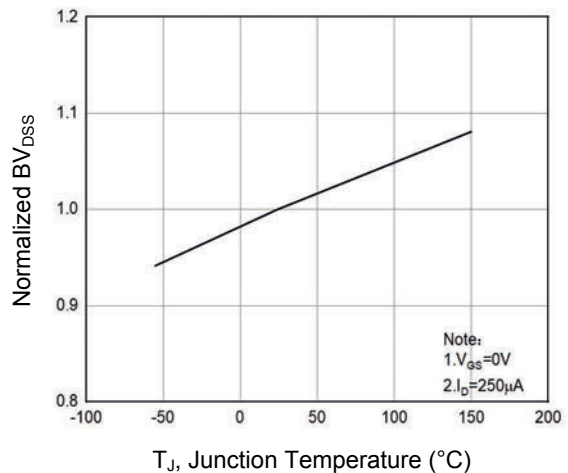
**Figure 3. Gate Charge**



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

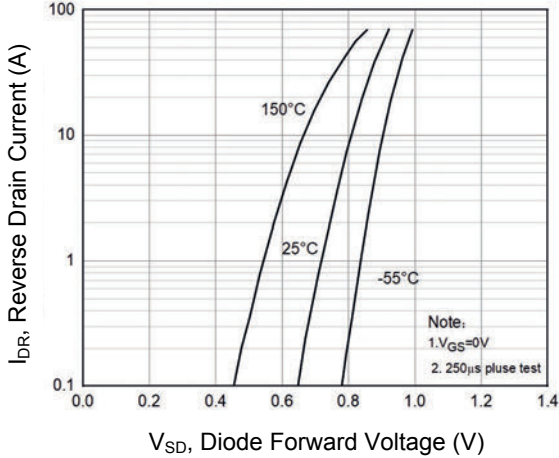


**Figure 5.  $R_{DS(ON)}$  Vs. Drain Current**

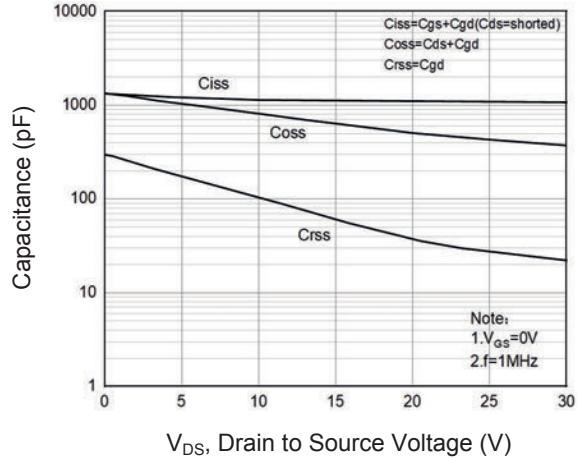


**Figure 6. Normalized  $BV_{DSS}$  Vs.  $T_J$**

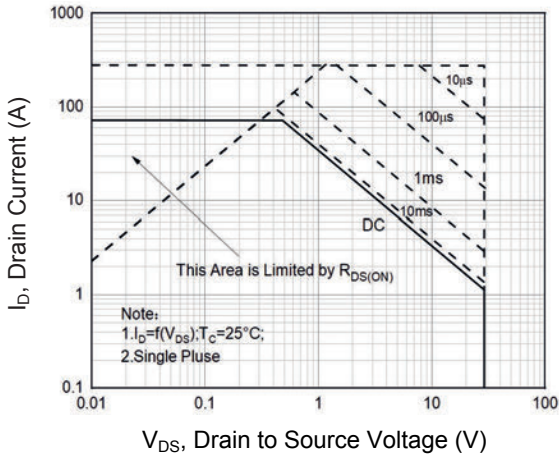
**Typical Electrical and Thermal Characteristic Curves**



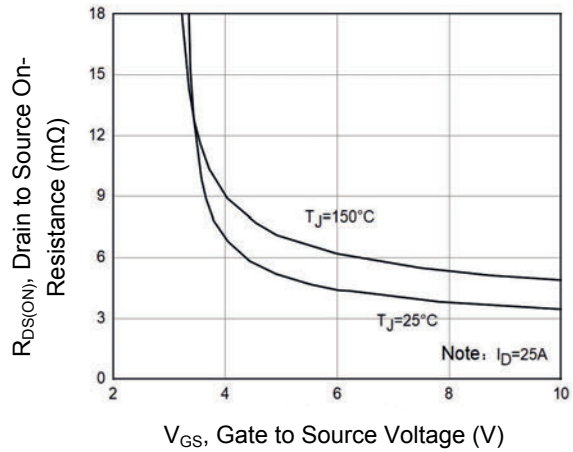
**Figure 7. Body Diode Characteristics**



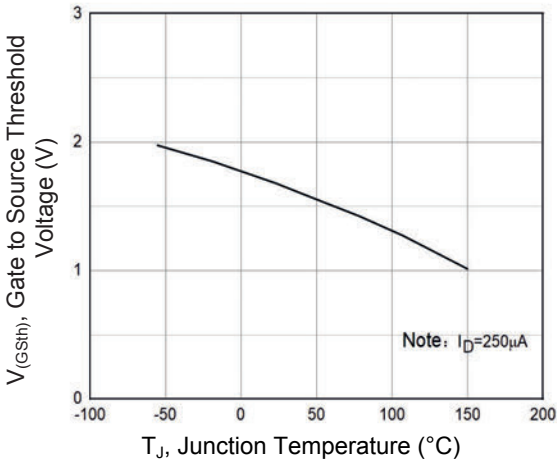
**Figure 8. Capacitance Characteristics**



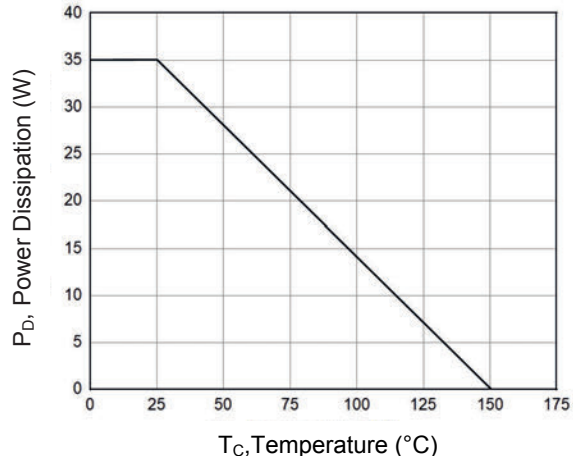
**Figure 9. Safe Operation Area**



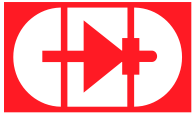
**Figure 10.  $R_{DS(on)}$  vs. Gate to Source Voltage**



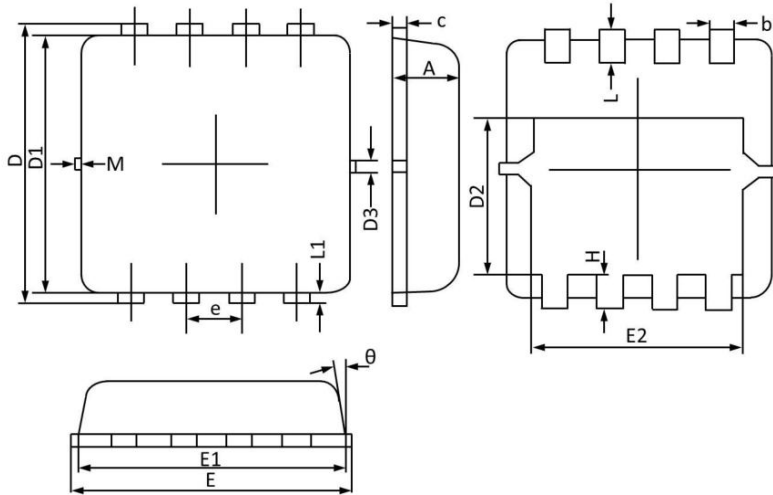
**Figure 11.  $V_{GS(th)}$  vs. Junction Temperature**



**Figure 12.  $P_D$  vs. Junction Temperature**



## Package Outline Dimensions (PPAK3x3)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.700	0.800	0.028	0.031
b	0.250	0.350	0.010	0.013
c	0.100	0.250	0.004	0.009
D	3.250	3.450	0.128	0.135
D1	3.000	3.200	0.119	0.125
D2	1.780	1.980	0.070	0.077
D3	0.130 REF		0.005 REF	
E	3.200	3.400	0.126	0.133
E1	3.000	3.200	0.119	0.125
E2	2.390	2.590	0.094	0.102
e	0.650 BSC		0.026 BSC	
H	0.300	0.500	0.011	0.019
L	0.300	0.500	0.011	0.019
L1	0.130 REF		0.005 REF	
θ	0°	12°	0°	12°
M	0.150 REF		0.006 REF	

## Order Information

Device	Package	Marking	Carrier	Quantity
GSGN4R303	PPAK3x3	N4R303	Tape & Reel	5,000pcs / Reel