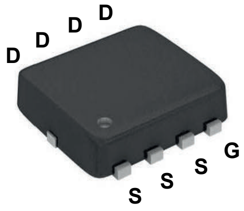
GSGN3R183

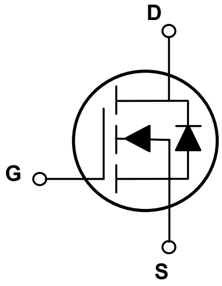
30V N-Channel MOSFET

Main Product Characteristics

BV_{DSS}	30V
$R_{DS(ON)}$	1.55mΩ (Max.)
I_D	183A



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 GSGN3R183 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 supply and a wide variety of other applications.

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	183	A
Drain Current-Continuous (T_C=100°C)		115	A
Pulsed Drain Current	I_{DM}	732	A
Maximum Power Dissipation	P_D	83	W
Derating Factor		0.66	W/°C
Single Pulse Avalanche Energy[1]	E_{AS}	400	mJ
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.51	°C/W
Thermal Resistance, Junction-to-Ambient[4]	$R_{\theta JA}$	60	°C/W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To +150	°C

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
On / Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1.2	1.6	2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=20A	-	1.25	1.55	mΩ
		V_{GS}=4.5V, I_D=20A	-	1.7	2.6	
Forward Transconductance	gfs	V_{DS}=5V, I_D=20A	-	60	-	S
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	V_{DS}=15V, V_{GS}=0V, F=1.0MHz	-	3135	-	pF
Output Capacitance	C_{oss}		-	825	-	
Reverse Transfer Capacitance	C_{rss}		-	40	-	
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DD}=15V, I_D=20A, V_{GS}=10V, R_G=1.6Ω	-	9	-	nS
Turn-On Rise Time[2]	t_r		-	8	-	
Turn-Off Delay Time[2]	$t_{d(off)}$		-	36	-	
Turn-Off Fall Time[2]	t_f		-	13	-	
Total Gate Charge[2]	Q_g	V_{DS}=15V, I_D=20A, V_{GS}=10V	-	37	-	nC
Gate-Source Charge[2]	Q_{gs}		-	9.0	-	
Gate-Drain Charge[2]	Q_{gd}		-	7.5	-	
Drain-Source Ratings and Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=20A	-	-	1.2	V
Diode Forward Current	I_S	-	-	-	183	A
Reverse Recovery Time	t_{rr}	T_J=25°C, I_F=40A, di/dt=100A/μs	-	25	-	nS
Reverse Recovery Charge	Q_{rr}		-	45	-	nC

Notes:

1. E_{AS} condition: T_J=25°C, V_{DD}=15V, V_G=10V, L=0.5mH, R_g=25Ω
2. Guaranteed by design, not subject to production
3. These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of $T_{J(MAX)}$=150°C. The SOA curve provides a single pulse rating.
4. The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. copper, in a still air environment with T_A=25°C. The value in any given application depends on the user's specific board design, and the maximum temperature of 150°C may be used if the PCB allows it.

Typical Electrical and Thermal Characteristic Curves

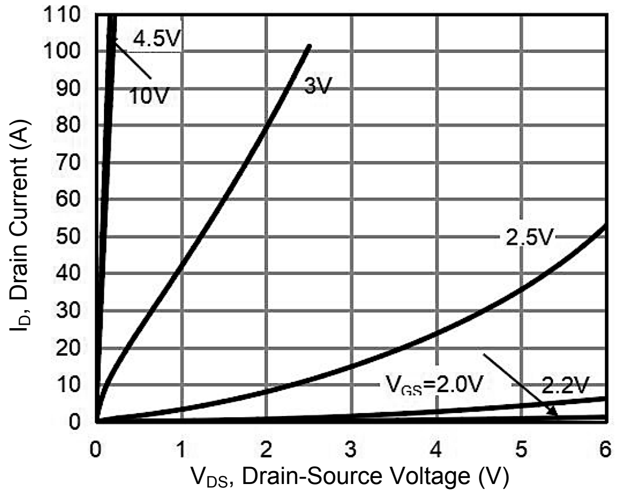


Figure 1. Output Characteristics

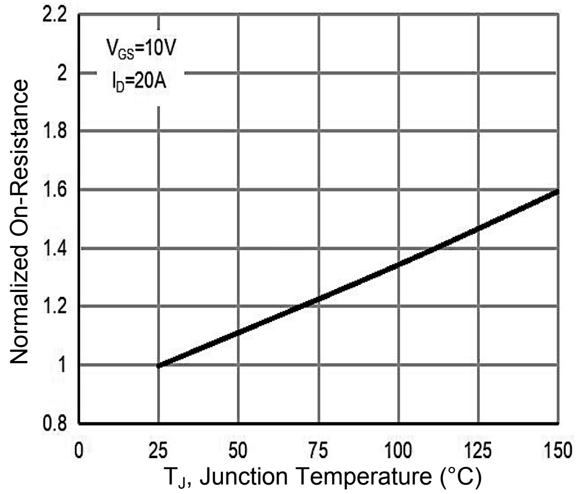


Figure 2. $R_{DS(ON)}$ vs. Junction Temperature

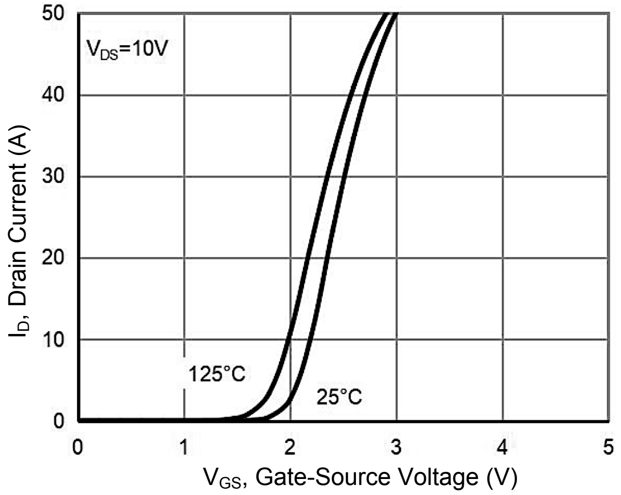


Figure 3. Transfer Characteristics

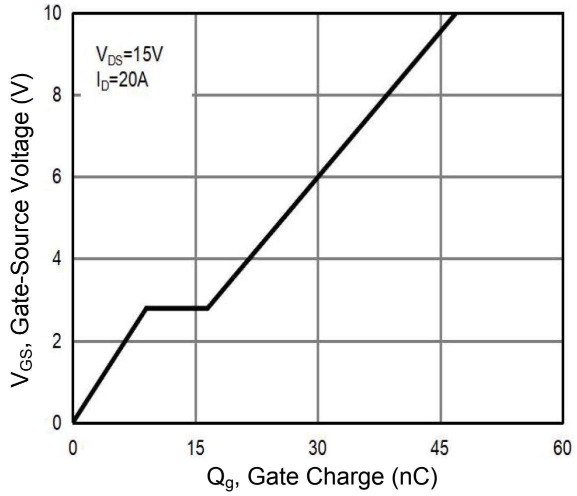


Figure 4. Gate Charge

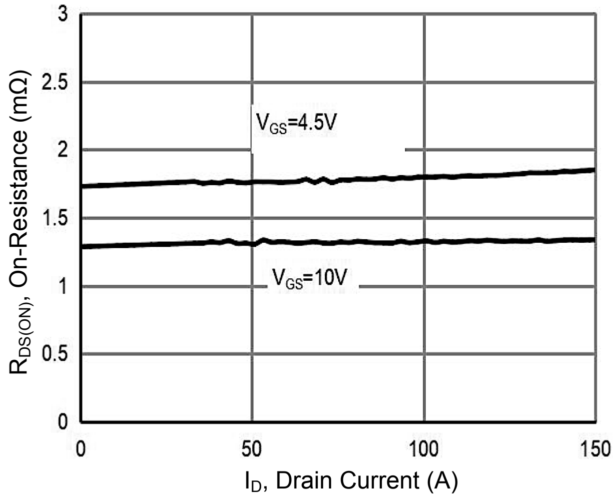


Figure 5. $R_{DS(ON)}$ vs. Drain Current

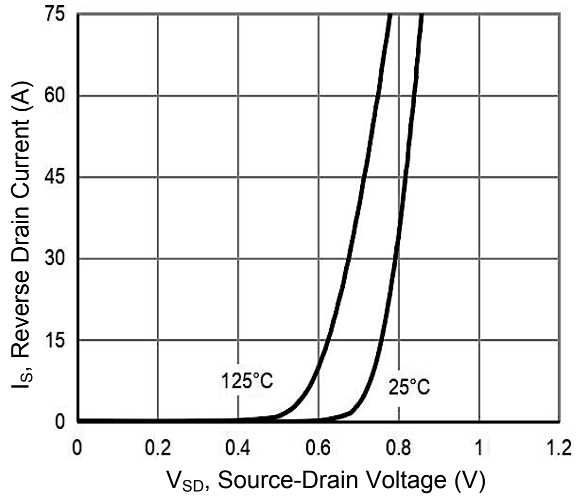


Figure 6. Source-Drain Diode Forward Voltage

Typical Electrical and Thermal Characteristic Curves

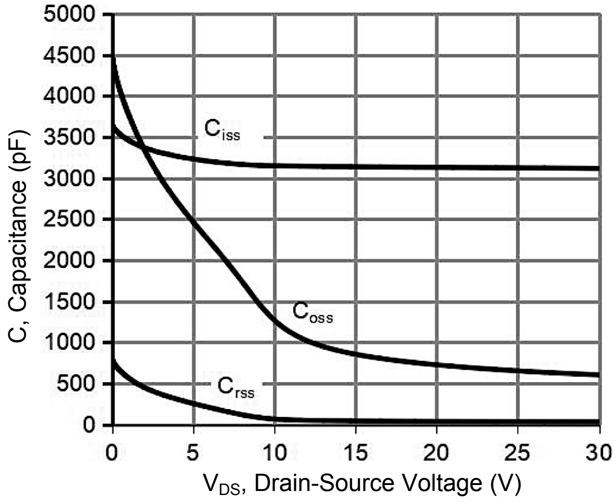


Figure 7. Capacitance vs. V_{DS}

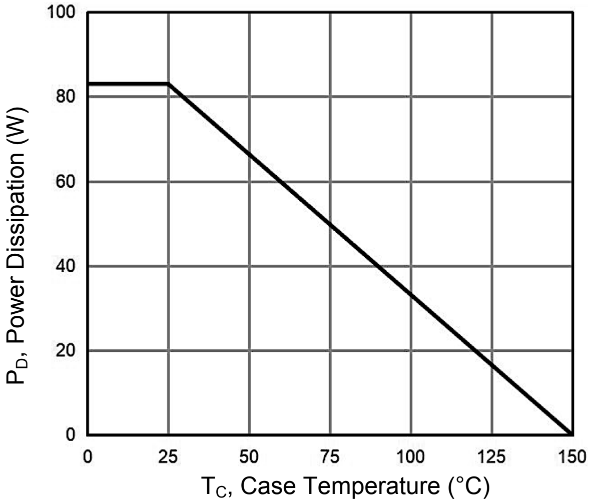


Figure 8. Power De-Rating

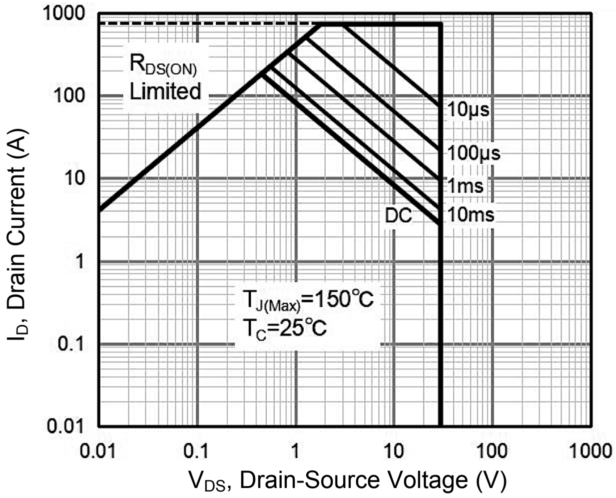


Figure 9. Safe Operation Area[3]

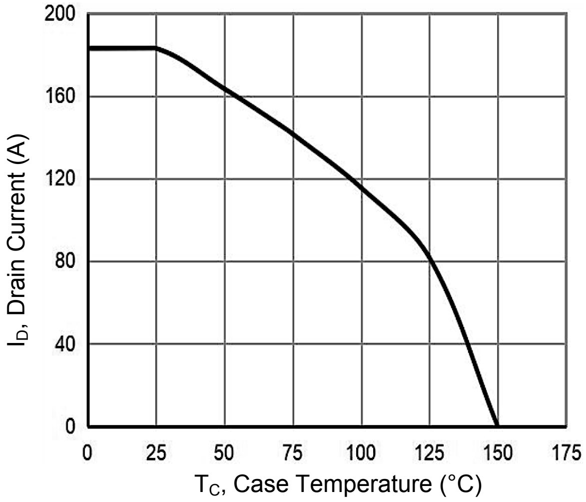


Figure 10. Current De-Rating

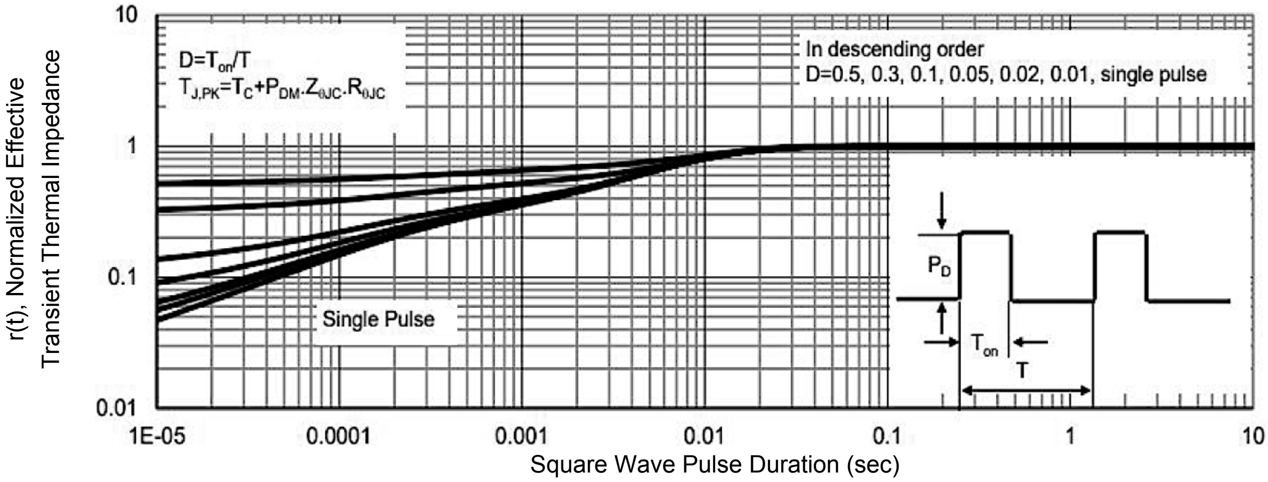
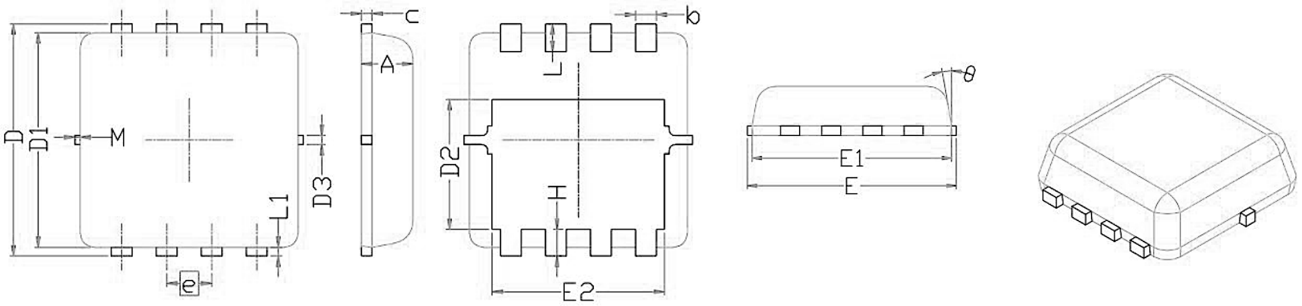


Figure 11. Normalized Maximum Transient Thermal Impedance

Package Outline Dimensions (PPAK3x3)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.70	0.80	0.028	0.031
b	0.25	0.35	0.010	0.014
c	0.10	0.25	0.004	0.010
D	3.25	3.45	0.128	0.136
D1	3.00	3.20	0.118	0.126
D2	1.78	1.98	0.070	0.078
D3	0.13 NOM		0.005 NOM	
E	3.10	3.30	0.122	0.130
E1	3.00	3.20	0.118	0.126
E2	2.39	2.59	0.094	0.102
e	0.65 BSC		0.026 BSC	
H	0.30	0.50	0.012	0.020
L	0.30	0.50	0.012	0.020
L1	0.13 NOM		0.005 NOM	
M	-	0.15	-	0.006
θ	-	12°	-	12°

Order Information

Device	Package	Marking	Packaging	SPQ
GSGN3R183	PPAK3x3	N3R183	Tape & Reel	5,000 Pcs / Reel