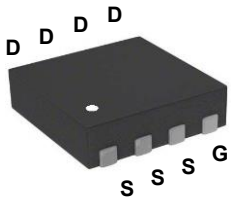
GOOD-ARK SEMICONDUCTOR

GSFN0180

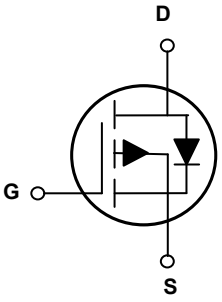
15V P-Channel MOSFET

Main Product Characteristics

BV_{DSS}	-15V
$R_{DS(ON)}$	3.9mΩ (Max.)
I_D	-80A



DFN3x3



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 GSFN0180 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	Value	Unit
Drain-Source Voltage	V_{DS}	-15	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current (T_C=25°C)[5]	I_D	-80	A
Drain Current (T_C=100°C)[5]		-51	
Drain Current (T_A=25°C)[5]		-22	
Drain Current (T_A=70°C)[5]		-17	
Pulsed Drain Current[2]	I_{DM}	-320	A
Total Power Dissipation (T_C=25°C)[3]	P_D	42	W
Total Power Dissipation (T_A=25°C)[3]		3.1	W
Thermal Resistance Junction-to-Ambient[1,4]	$R_{\theta JA}$	40	°C/W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	2.95	°C/W
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	Units
On / Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=-250μA	-15	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-15V, V_{GS}=0V, T_C=25°C	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±12V, V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-0.4	-	-1	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-20A	-	2.7	3.9	mΩ
		V_{GS}=-2.5V, I_D=-16A	-	3.6	6.4	
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	V_{DS}=-10V, V_{GS}=0V, f=1MHz	-	4766	-	pF
Output Capacitance	C_{oss}		-	632	-	
Reverse Transfer Capacitance	C_{rss}		-	612	-	
Total Gate Charge	Q_g	V_{GS}=-4.5V, V_{DS}=-10V, I_D=-30A	-	57	-	nC
Gate Source Charge	Q_{gs}		-	9.7	-	
Gate Drain Charge	Q_{gd}		-	10.6	-	
Turn-On Delay Time	$t_{d(on)}$	V_{GS}=-4.5V, V_{DS}=-10V, I_D=-18A, R_{GEN}=4.7Ω	-	15.2	-	nS
Turn-On Rise Time	t_r		-	54	-	
Turn-Off Delay Time	$t_{d(off)}$		-	152	-	
Turn-Off Fall Time	t_f		-	120	-	
Drain-Source Ratings and Characteristics						
Diode Forward Voltage	V_{SD}	I_S=-20A, V_{GS}=0V	-	-0.8	-1.2	V
Maximum Body-Diode Continuous Current	I_S	-	-	-	-80	A

Note :

1. 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 power dissipation PDSM is based on $R_{\theta JA}$ t ≤10s and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
2. Single pulse width limited by junction temperature $T_{J(MAX)}$=150°C.
3. The power dissipation P_D is based on $T_{J(MAX)}$=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
4. The $R_{\theta JA}$ is the sum of the thermal impedance from junction to case $R_{\theta JA}$ and case to ambient.
5. The maximum current rating is silicon limit and will be limited by package.

Typical Electrical and Thermal Characteristic Curves

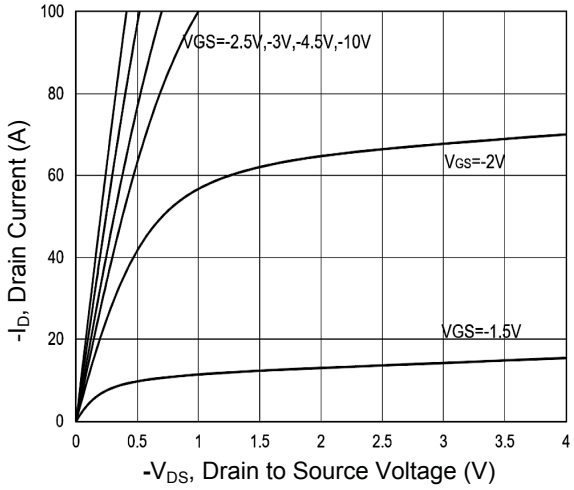


Figure 1. Output Characteristics

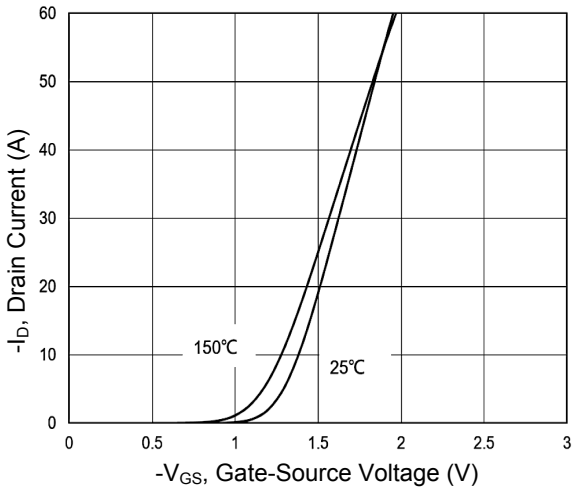


Figure 2. Transfer Characteristics

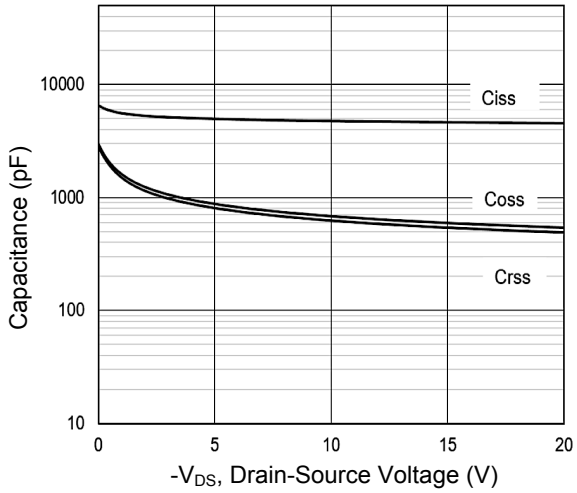


Figure 3. Capacitance Characteristics

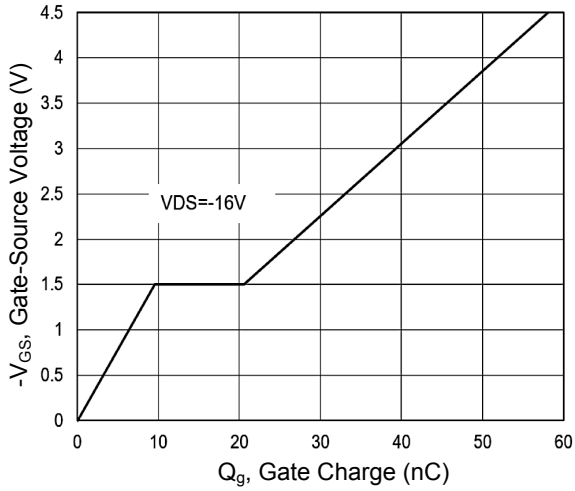


Figure 4. Gate Charge

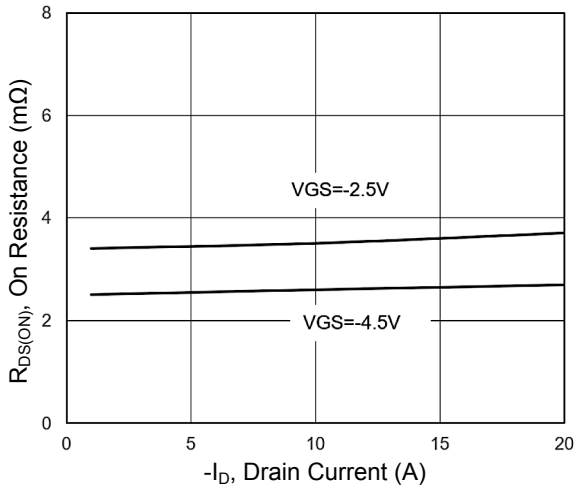


Figure 5. Drain-Source On Resistance

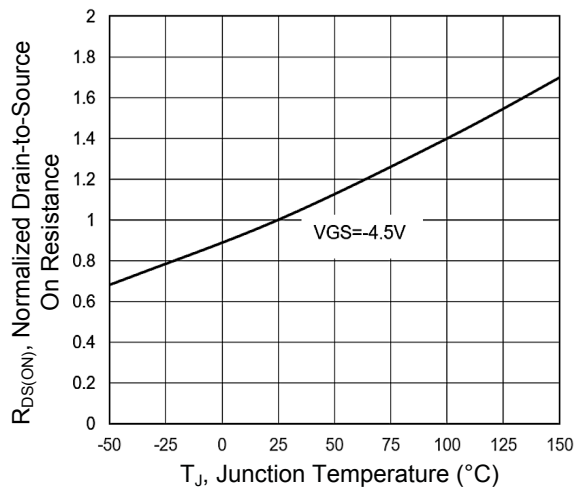


Figure 6. Normalized On Resistance vs. T_J

Typical Electrical and Thermal Characteristic Curves

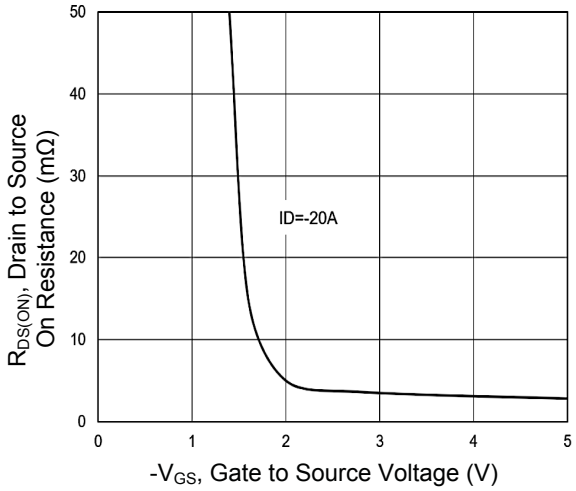


Figure 7. Typical Drain to Source On Resistance vs. Gate Voltage

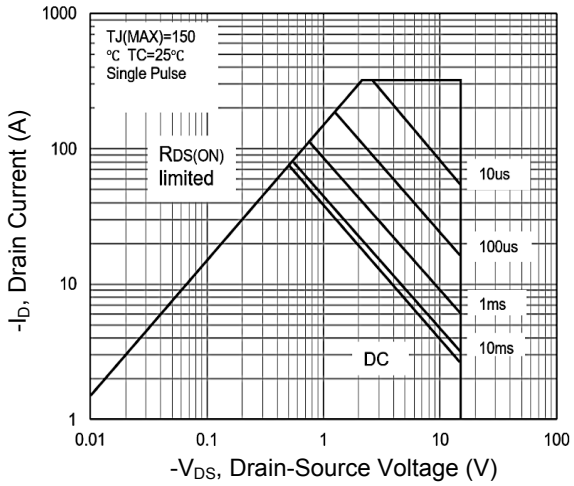


Figure 8. Safe Operation Area

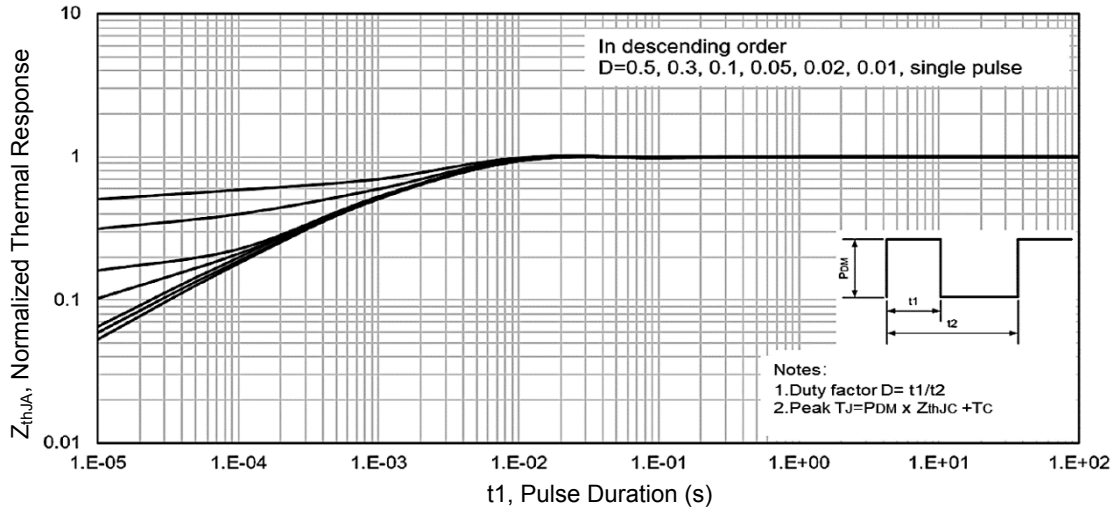
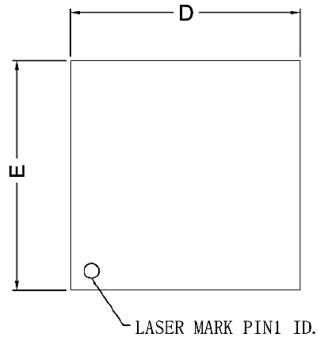
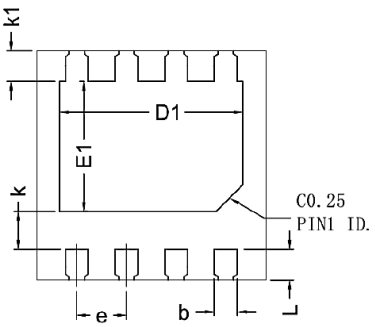


Figure 9. Maximum Effective Transient Thermal Impedance, Junction-to-Case

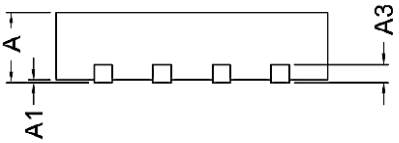
Package Outline Dimensions (DFN3x3)



TOP VIEW



BOTTOM VIEW



SIDE VIEW

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.70	0.80	0.028	0.031
A1	-	0.05	-	0.002
A3	0.20 REF		0.008 REF	
b	0.25	0.35	0.010	0.014
D	2.95	3.05	0.116	0.120
D1	2.35	2.45	0.093	0.096
E	2.95	3.05	0.116	0.120
E1	1.65	1.75	0.065	0.069
e	0.65 BSC		0.026 BSC	
k	0.50 REF		0.020 REF	
k1	0.40 REF		0.016 REF	
L	0.35	0.45	0.014	0.018

Order Information

Device	Package	Marking	Packaging	SPQ
GSFN0180	DFN3x3	PB03RF30	Tape & Reel	5,000 Pcs / Reel