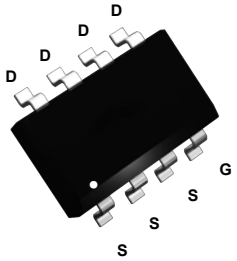
GOOD-ARK SEMICONDUCTOR

GSFQ6R803

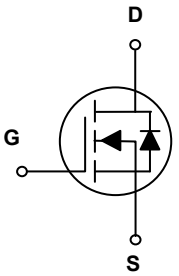
30V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	30V
$R_{DS(ON)}$	6.8mΩ (Max.)
I_D	20A



SOP-8



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 GSFQ6R803 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}	30	V
Gate-to-Source Voltage	V_{GS}	±20	V
Continuous Drain Current, @ Steady-State (T_C=25°C)	I_D	20	A
Continuous Drain Current, @ Steady-State (T_C=100°C)		13	A
Pulsed Drain Current (T_C=25°C)[1]	I_{DM}	80	A
Power Dissipation (T_C=25°C)[2]	P_D	3.6	W
Single Pulse Current	I_{AS}	11.6	A
Single Pulse Avalanche Energy[5]	E_{AS}	33.6	mJ
Junction-to-Case	$R_{\theta JC}$	35	°C/W
Junction-to-Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	62	°C/W
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +150	°C
Soldering Temperature (SMD)	T_{SOLD}	260	°C

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
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	-	-	1.0	μA
		V_{DS}=30V, V_{GS}=0V,T_J=125°C	-	2.0	-	
Gate-to-Source Forward Leakage	I_{GSS}	V_{DS}=0V,V_{GS}=± 20V	-	-	± 100	nA
Static Drain-to-Source On-Resitance	$R_{DS\ (on)}$	V_{GS}=10V, I_D=10A	-	5.3	6.8	mΩ
		V_{GS}=4.5V, I_D=8A	-	7.7	10	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1.1	-	2.5	V
Gate Resistance	Rg	f=1MHz	-	2.3	-	Ω
Input Capacitance	Ciss	V_{GS}=0V V_{DS}=15V,f=1MHz	-	865	-	pF
Output Capacitance	Coss		-	497	-	
Reverse transfer capacitance	Crss		-	35	-	
Total Gate Charge[3,4]	Qg	I_D=20A, V_{DD}=15V,V_{GS}=10V	-	16.2	-	nC
Gate-to-Source Charge[3,4]	Qgs		-	3.4	-	
Gate-to-Drain("Miller") Charge[3,4]	Qgd		-	2.3	-	
Gate-to- Plateau[3,4]	Vplateau		-	3.4	-	V
Turn-on Delay Time[3,4]	td(on)	V_{DD}=20V, V_{GS}=10V, R_G=3Ω,I_D=9A	-	4.4	-	nS
Rise Time[3,4]	tr		-	31	-	
Turn-Off Delay Time[3,4]	td(off)		-	21	-	
Fall Time[3,4]	tf		-	12	-	

Drain-Source Ratings and Characteristics

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	20	A
Diode Pulse Current	$I_{S,pulse}$		-	-	80	A
Diode Forward Voltage	V_{SD}	I_S=5A, V_{GS}=0V	-	-	1.4	V
Reverse Recovery Time[3]	t_{rr}	I_S=2A, V_{GS}=0V,V_R=30V, dI_F/dt=100A/us	-	30	-	nS
Reverse Recovery Charge[3]	Q_{rr}		-	15	-	nC

Notes:

1. Pulse time of 5μs.
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 ≤ 300μs, duty cycle ≤ 2%.
4. Basically unaffected by operating temperature.
5. L=0.5mH, R_G=25Ω, V_{DD}=24V, T_J=25°C.

Typical Electrical and Thermal Characteristic Curves

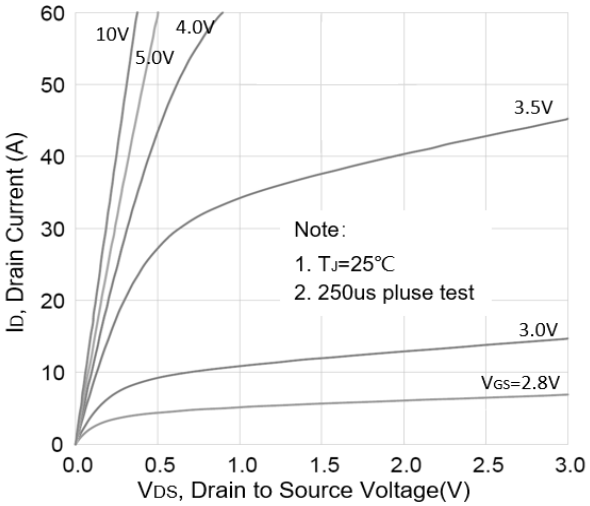


Figure1. Typical Output Characteristics

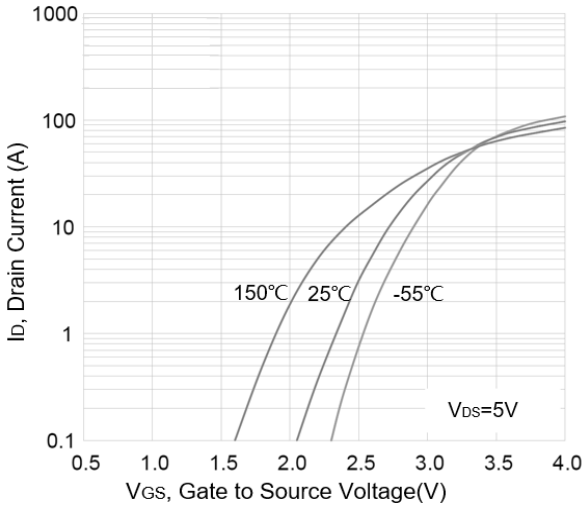


Figure2. Transfer Characteristics

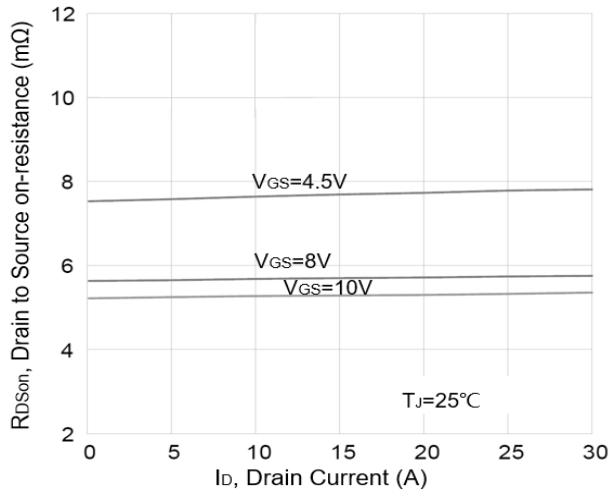


Figure3. Rdson vs. Drain Current

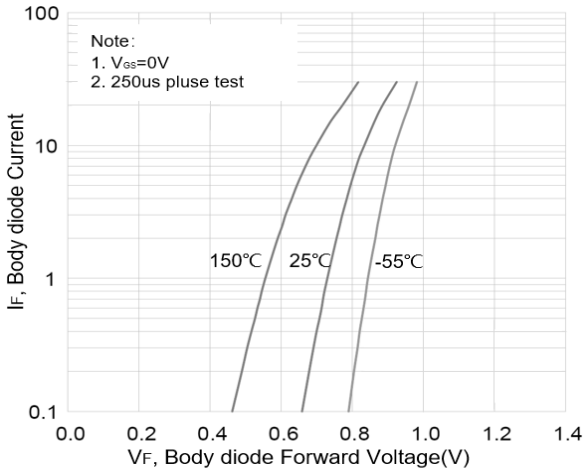


Figure4. Body Diode Characteristics

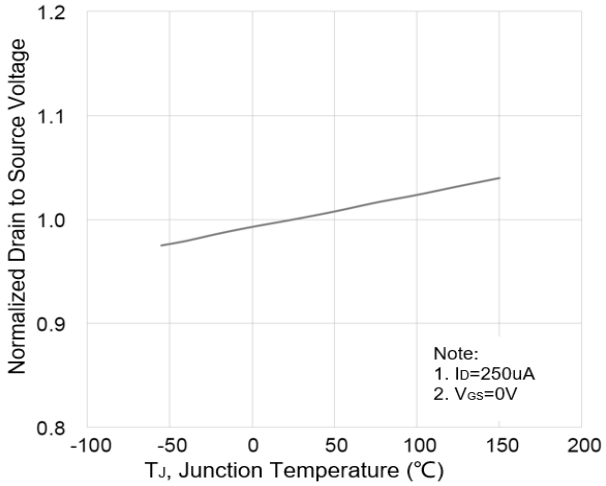


Figure5. Normalized BVdss vs.TJ

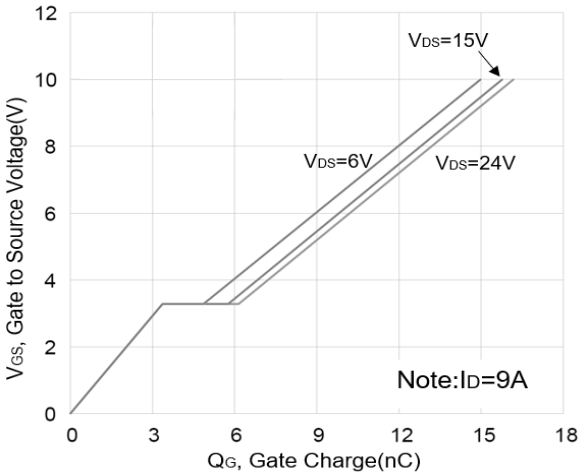


Figure6. Gate Charge

Typical Electrical and Thermal Characteristic Curves

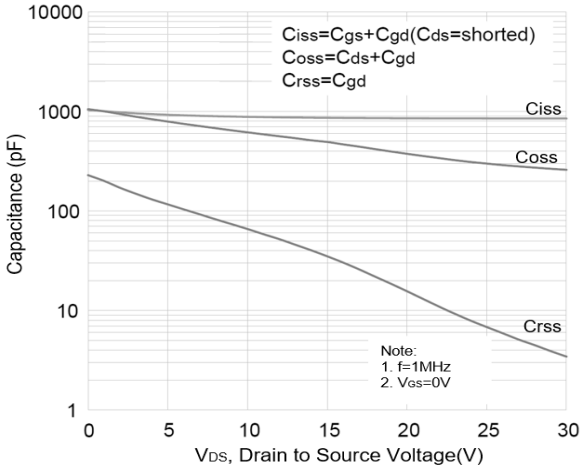


Figure7. Capacitance Characteristics

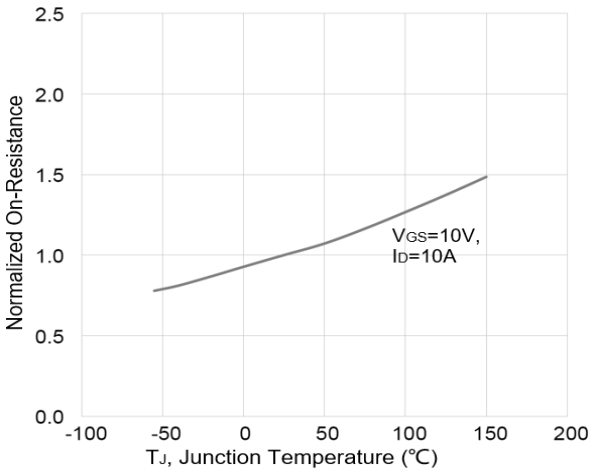


Figure8. Normalized Rdson vs.T_J

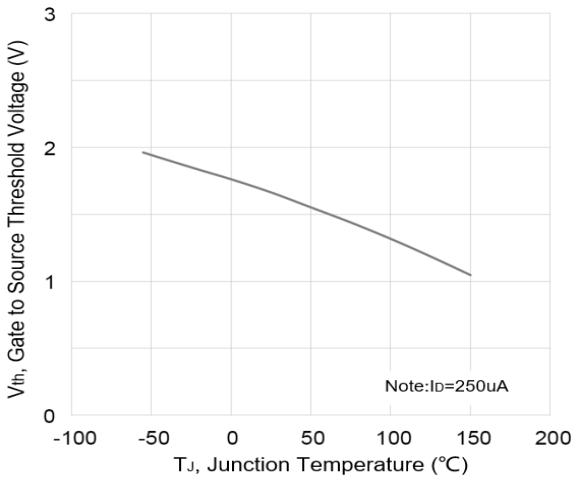


Figure9. Power Dissipation vs. T_J

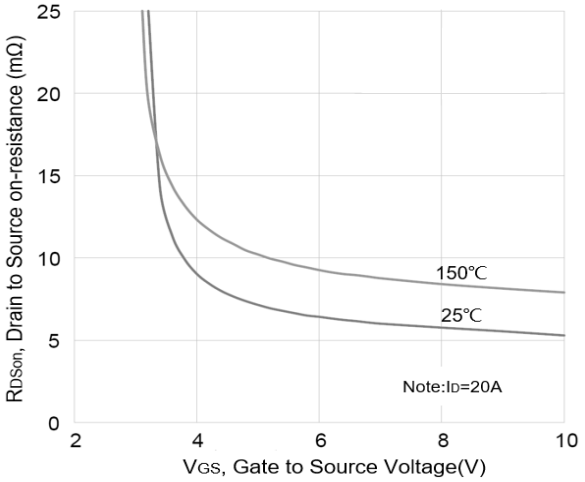
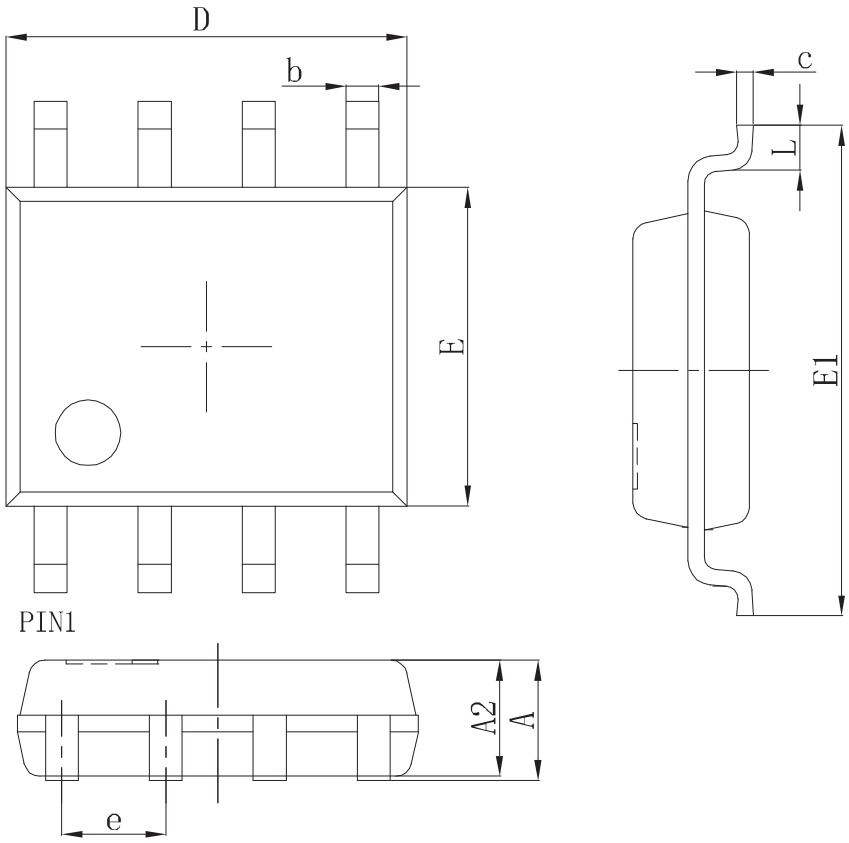


Figure10. Rdson vs. Gate to Source Voltage(V)

Package Outline Dimensions (SOP-8)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.30	1.70	0.051	0.067
A2	1.25	1.55	0.049	0.061
c	0.17	0.25	0.007	0.010
E	3.80	4.00	0.150	0.157
E1	5.80	6.20	0.228	0.244
L	0.45	0.75	0.018	0.030
b	0.33	0.51	0.013	0.020
D	4.80	5.00	0.189	0.197
e	1.27 BSC		0.050 BSC	

Order Information

Device	Package	Marking	Carrier	Quantity
GSFQ6R803	SOP-8	Q6R803	Tape & Reel	3,000 Pcs / Reel