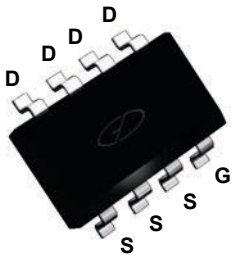
GOOD-ARK
SEMICONDUCTOR

GSFQ2603

20V P-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	-20V
$R_{DS(ON)}$	8.5mΩ
I_D	-14A



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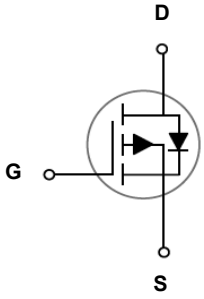


Schematic Diagram

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

RoHS Compliant

Description

The GSFQ2603 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	Rating	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current – Continuous (T_C=25°C)	I_D	-14	A
Drain Current – Continuous (T_C=100°C)		-8.8	A
Drain Current – Pulsed[1]	I_{DM}	-56	A
Power Dissipation (T_C=25°C)	P_D	2	W
Power Dissipation – Derate above 25°C		0.016	W/°C
Storage Temperature Range	T_{STG}	-55 to +150	°C
Operating Junction Temperature Range	T_J	-55 to +150	°C

Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	---	62	°C/W
Thermal Resistance Junction to Case	$R_{\theta JC}$	---	17	°C/W

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=-250uA	-20	---	---	V
BV_{DSS} Temperature Coefficient	$\triangle BV_{DSS}/\triangle T_J$	Reference to 25ÁC, I_D=-1mA	---	-0.01	---	V/ÁC
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-20V, V_{GS}=0V, T_J=25ÁC	---	---	-1	uA
		V_{DS}=-16V, V_{GS}=0V, T_J=125ÁC	---	---	-10	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=Ñ12V, V_{DS}=0V	---	---	Ñ100	nA
On Characteristics						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-8A	---	6.5	8.5	mq
		V_{GS}=-2.5V, I_D=-5A	---	9	12	
		V_{GS}=-1.8V, I_D=-3A	---	12	17	
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D =-250uA	-0.3	-0.6	-1	V
Forward Transconductance	gfs	V_{DS}=-10V, I_S=-5A	---	20	---	S
Dynamic and Switching Characteristics						
Total Gate Charge[2, 3]	Q_g	V_{DS}=-10V, V_{GS}=-4.5V, I_D=-5A	---	44.4	80	nC
Gate-Source Charge[2, 3]	Q_{gs}		---	7.2	14	
Gate-Drain Charge[2, 3]	Q_{gd}		---	10.2	20	
Turn-On Delay Time[2, 3]	$T_{d(on)}$	V_{DD}=-10V, V_{GS}=-4.5V, R_G=25q , I_D=-1A	---	13.2	26	nS
Rise Time[2, 3]	T_r		---	68	120	
Turn-Off Delay Time[2, 3]	$T_{d(off)}$		---	160	320	
Fall Time[2, 3]	T_f		---	154	300	
Input Capacitance	C_{iss}	V_{DS}=-15V, V_{GS}=0V, F=1MHz	---	4060	8000	pF
Output Capacitance	C_{oss}		---	520	1000	
Reverse Transfer Capacitance	C_{rss}		---	400	800	
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	V_G=V_D=0V, Force Current	---	---	-14	A
Pulsed Source Current	I_{SM}		---	---	-28	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=-1A, T_J=25ÁC	---	---	-1	V

Note:
1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width ≦ 300 uS, duty cycle ≦ 2 % .
3. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

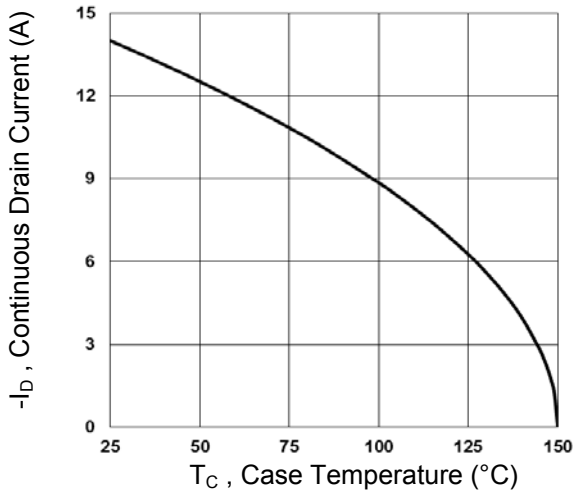


Fig.1 Continuous Drain Current vs. T_C

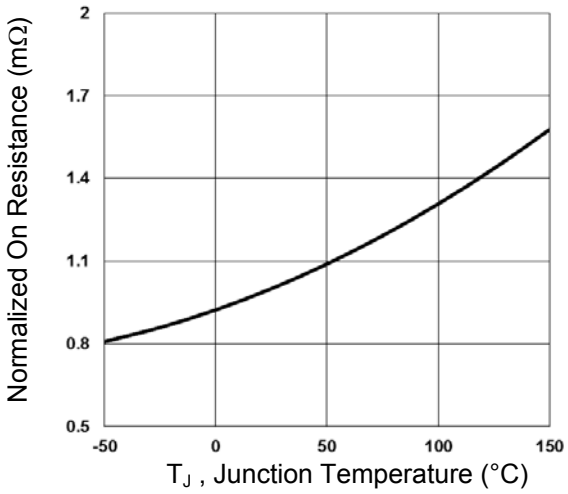


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

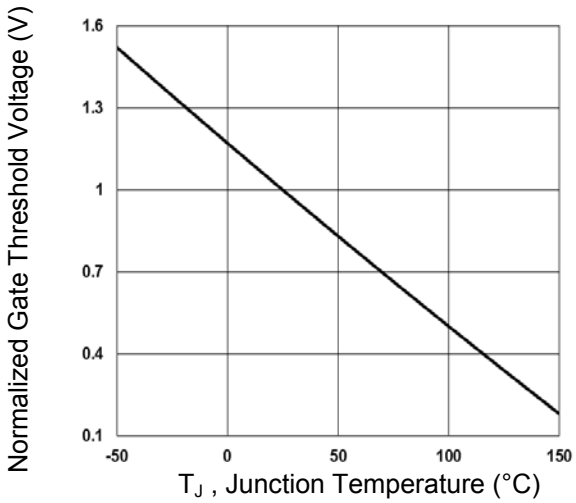


Fig.3 Normalized V_{th} vs. T_J

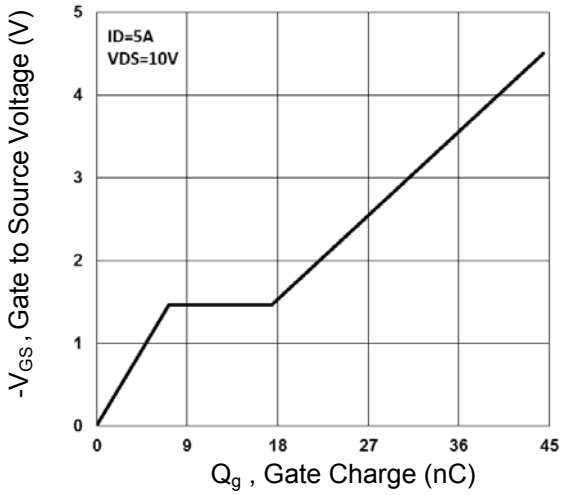


Fig.4 Gate Charge Waveform

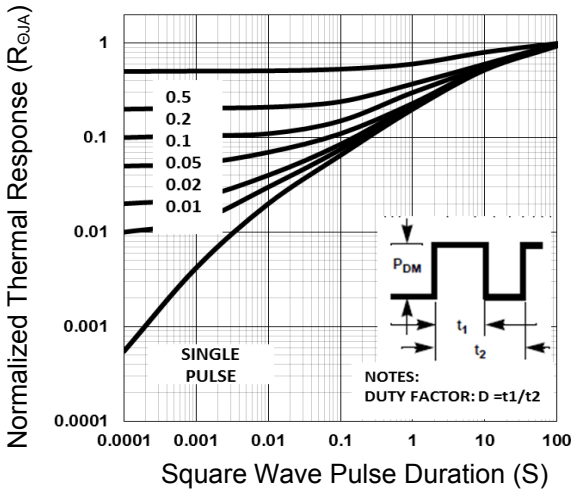


Fig.5 Normalized Transient Response

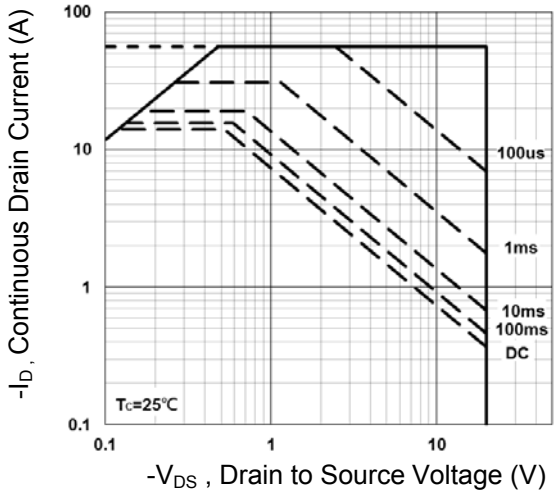


Fig.6 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

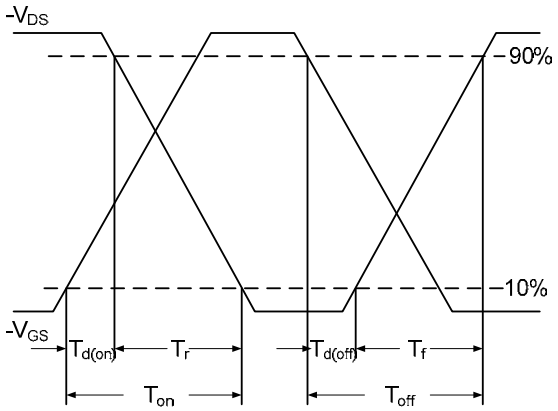


Fig.7 Switching Time Waveform

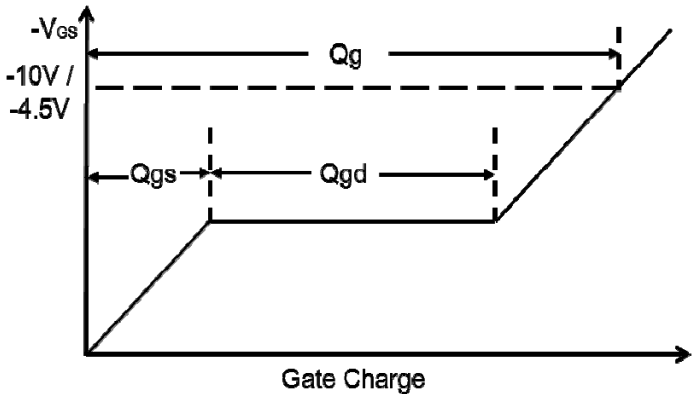
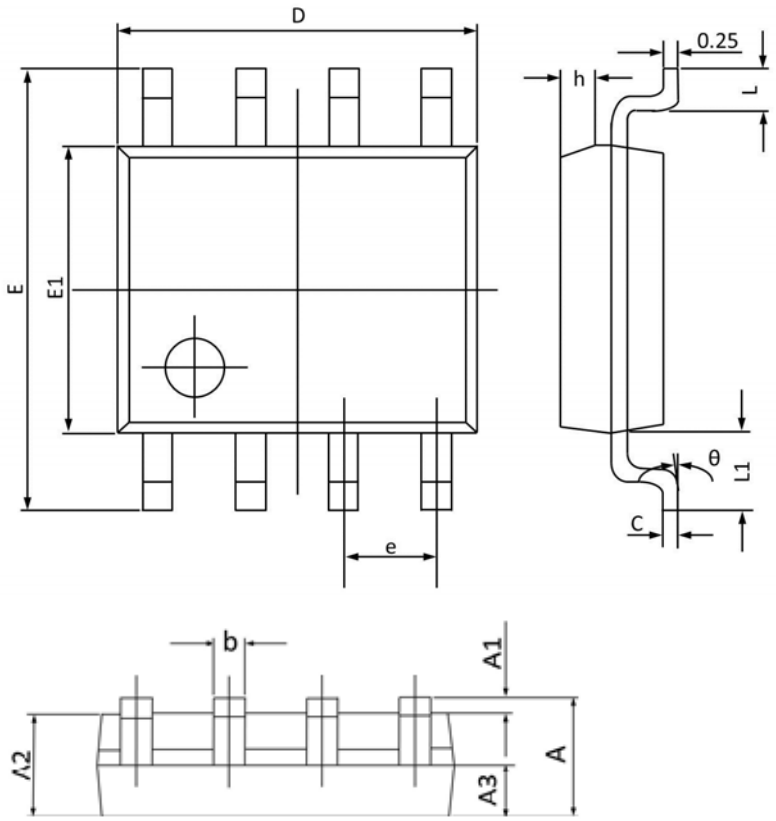


Fig.8 Gate Charge Waveform

Package Outline Dimensions SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.35	1.75	0.053	0.068
A1	0.1	0.25	0.004	0.009
A2	1.3	1.5	0.052	0.059
A3	0.6	0.7	0.024	0.027
b	0.39	0.48	0.016	0.018
c	0.21	0.26	0.009	0.01
D	4.7	5.1	0.186	0.2
E	5.8	6.2	0.229	0.244
E1	3.7	4.1	0.146	0.161
e	1.270(BSC)		0.050(BSC)	
h	0.25	0.5	0.01	0.019
L	0.5	0.8	0.019	0.031
L1	1.050(BSC)		0.041(BSC)	
θ	0°	8°	0°	8°