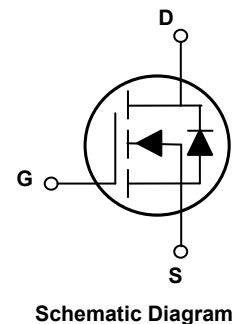
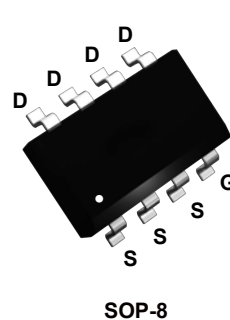


Main Product Characteristics

$V_{(BR)DSS}$	60V
$R_{DS(ON)}$	20m Ω (Max.)
I_D	9A



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 GSFQ6020 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 ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-to-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current, @ Steady-State ($T_C=25^{\circ}\text{C}$) ¹	I_D	9.0	A
Continuous Drain Current, @ Steady-State ($T_C=100^{\circ}\text{C}$)		6.7	A
Pulsed Drain Current ²	I_{DM}	36	A
Power Dissipation ($T_C=25^{\circ}\text{C}$)	P_D	3.5	W
Linear Derating Factor ($T_C=25^{\circ}\text{C}$)		0.028	W/ $^{\circ}\text{C}$
Single Pulse Avalanche Energy ³	E_{AS}	405	mJ
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	35.7	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction-to-Ambient (PCB Mounted, Steady-State) ⁴	$R_{\theta JA}$	62.5	$^{\circ}\text{C}/\text{W}$
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +150	$^{\circ}\text{C}$

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	60	-	-	V
Drain-to-Source Leakage Current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V$	-	-	1	μA
Gate-to-Source Forward Leakage	I_{GSS}	$V_{GS}=20V$	-	-	100	nA
		$V_{GS}=-20V$	-	-	-100	
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=10A$	-	14	20	m Ω
		$V_{GS}=4.5V, I_D=5A$	-	16	32	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.1	-	2.8	V
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=25V, f=1MHz$	-	2200	-	pF
Output Capacitance	C_{oss}		-	172	-	
Reverse Transfer Capacitance	C_{rss}		-	131	-	
Total Gate Charge	Q_g	$I_D=60A, V_{DD}=48V, V_{GS}=10V$	-	52	-	nC
Gate-to-Source Charge	Q_{gs}		-	11	-	
Gate-to-Drain ("Miller") Charge	Q_{gd}		-	12	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=10V, V_{DD}=30V, I_D=30A, R_G=25\Omega$	-	16	-	nS
Rise Time	t_r		-	73	-	
Turn-Off Delay Time	$t_{d(off)}$		-	182	-	
Fall Time	t_f		-	80	-	
Gate Resistance	R_g	$f=1MHz$	-	3.5	-	Ω
Drain-Source Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	10	A
Pulsed Source Current (Body Diode)	I_{SM}		-	-	40	A
Diode Forward Voltage	V_{SD}	$I_S=5A, V_{GS}=0V$	-	-	1.3	V
Reverse Recovery Time	t_{rr}	$V_{GS}=0V, I_S=10A, di_F/dt=100A/\mu s$	-	19	-	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. $L=10mH, V_{DD}=50V, R_G=10\Omega, T_J=25^{\circ}C$.
4. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Typical Electrical and Thermal Characteristic Curves

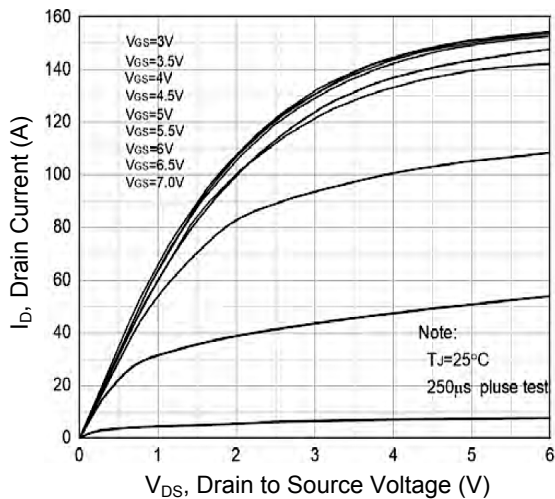


Figure 1. Output Characteristics

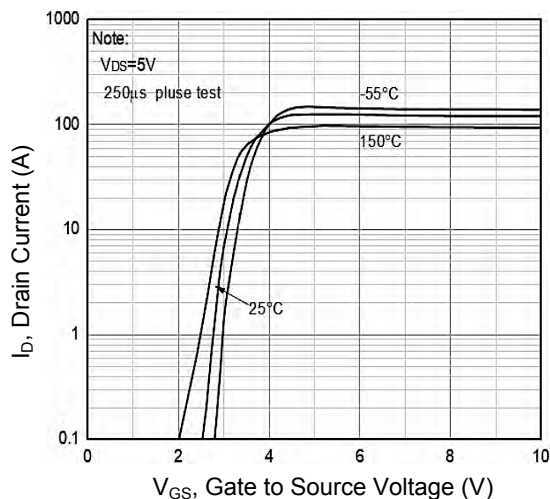


Figure 2. Transfer Characteristics

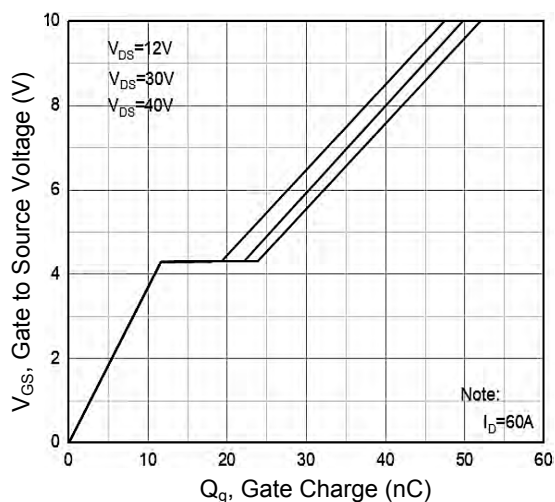


Figure 3. Gate Charge Characteristics

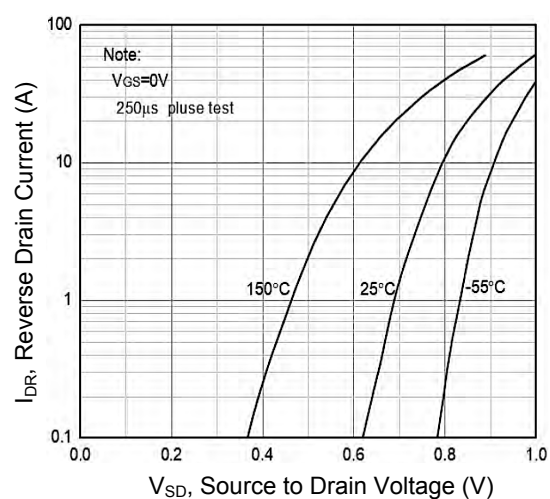


Figure 4. Body Diode Characteristics

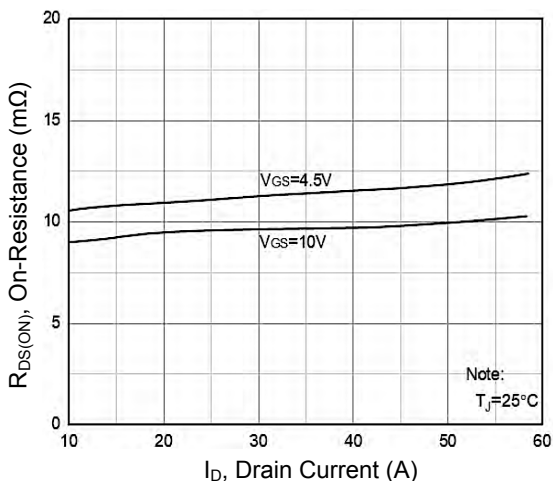


Figure 5. On-Resistance vs. Drain Current

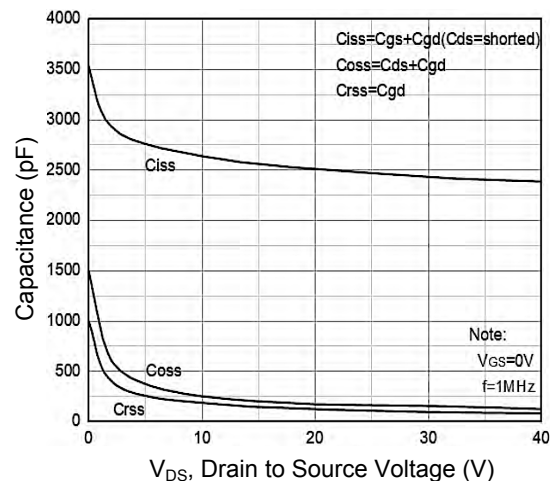


Figure 6. Capacitance Characteristics

Typical Electrical and Thermal Characteristic Curves

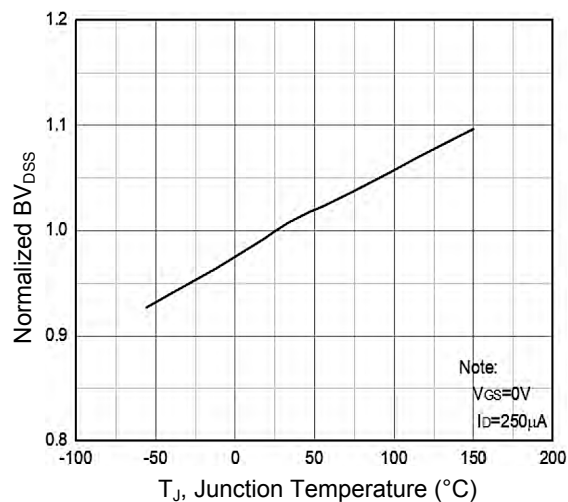


Figure 7. Normalized BV_{DSS} vs. T_J

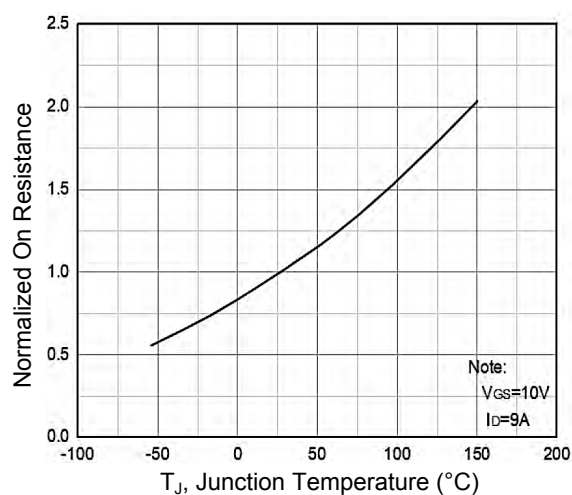


Figure 8. Normalized $R_{DS(ON)}$ vs. T_J

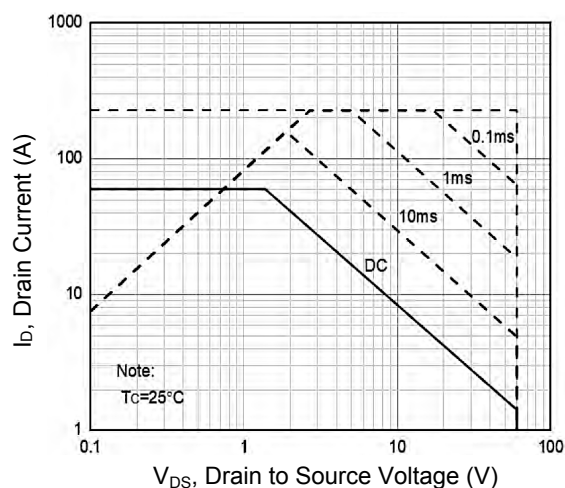
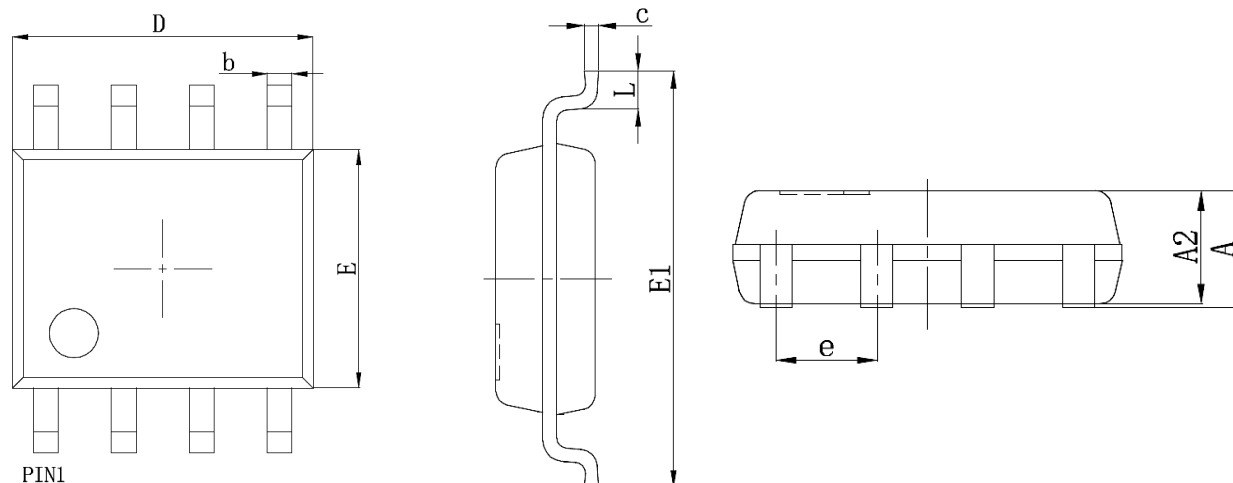


Figure 9. Safe Operation Area

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
GSFQ6020	SOP-8	Q6020	Tape & Reel	3,000 Pcs / Reel