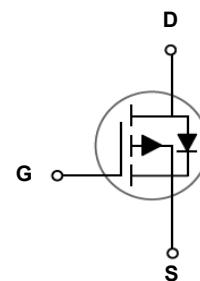


Main Product Characteristics

$V_{(BR)DSS}$	-20V
$R_{DS(ON)}$	41mΩ (Max)
I_D	-4.9A



SOT-23



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Low on-resistance and low gate charge.
- Featuring low switching and drive losses.
- Fast switching and reverse body recovery.
- High ruggedness and robustness.



Description

The GSFC02R41 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	Max.	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-to-Source Voltage	V_{GS}	± 10	V
Continuous Drain Current, @ Steady-State ($T_C=25^\circ\text{C}$)	I_D	-4.9	A
Continuous Drain Current, @ Steady-State ($T_C=100^\circ\text{C}$)		-3.2	A
Pulsed Drain Current ¹	I_{DM}	-19	A
Power Dissipation ($T_C=25^\circ\text{C}$)	P_D	1.56	W
Power Dissipation - Derate Above 25°C		0.012	W/°C
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	80	°C/W
Operating Junction and Storage Temperature Range	T_J / T_{STG}	-55 to +150	°C


GSFC02R41
20V P-Channel MOSFET
Electrical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-to-Source Breakdown Voltage	BV_{DSS}	$V_{\text{GS}}=0\text{V}, I_{\text{D}}=-250\mu\text{A}$	-20	-	-	V
BV_{DSS} Temperature Coefficient	$\Delta \text{BV}_{\text{DSS}}/\Delta T_J$	Reference to 25°C , $I_{\text{D}}=-1\text{mA}$	-	-0.02	-	$\text{V}/^\circ\text{C}$
Drain-to-Source Leakage Current	I_{DSS}	$V_{\text{DS}}=-20\text{V}, V_{\text{GS}}=0\text{V}, T_J=25^\circ\text{C}$	-	-	-1	μA
		$V_{\text{DS}}=-16\text{V}, V_{\text{GS}}=0\text{V}, T_J=125^\circ\text{C}$	-	-	-10	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{\text{GS}}=\pm 10\text{V}, V_{\text{DS}}=0\text{V}$	-	-	± 100	nA
Static Drain-to-Source On-Resistance	$R_{\text{DS}(\text{on})}$	$V_{\text{GS}}=-4.5\text{V}, I_{\text{D}}=-4\text{A}$	-	31	41	$\text{m}\Omega$
		$V_{\text{GS}}=-2.5\text{V}, I_{\text{D}}=-2\text{A}$	-	45	57	
		$V_{\text{GS}}=-1.8\text{V}, I_{\text{D}}=-1\text{A}$	-	67	85	
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{DS}}=V_{\text{GS}}, I_{\text{D}}=-250\mu\text{A}$	-0.4	-0.65	-0.9	V
$V_{\text{GS}(\text{th})}$ Temperature Coefficient	$\Delta V_{\text{GS}(\text{th})}$		-	2	-	$\text{mV}/^\circ\text{C}$
Forward Transconductance	g_{fs}	$V_{\text{DS}}=-10\text{V}, I_{\text{S}}=-3\text{A}$	-	7	-	S
Dynamic and Switching Characteristic						
Input Capacitance	C_{iss}	$V_{\text{GS}}=0\text{V}, V_{\text{DS}}=-10\text{V}, F=1\text{MHz}$	-	950	1230	pF
Output Capacitance	C_{oss}		-	75	100	
Reverse Transfer Capacitance	C_{rss}		-	58	80	
Total Gate Charge ^{2,3}	Q_g	$I_{\text{D}}=-3\text{A}, V_{\text{DS}}=-10\text{V}, V_{\text{GS}}=-4.5\text{V}$	-	10.2	13	nC
Gate-to-Source Charge ^{2,3}	Q_{gs}		-	1.8	2	
Gate-to-Drain Charge ^{2,3}	Q_{gd}		-	2.1	4	
Turn-on Delay Time ^{2,3}	$t_{\text{d}(\text{on})}$	$V_{\text{GS}}=-4.5\text{V}, V_{\text{DD}}=-10\text{V}, R_{\text{G}}=25\Omega, I_{\text{D}}=-1\text{A}$	-	6.2	11	nS
Rise Time ^{2,3}	t_r		-	21.6	41	
Turn-Off Delay Time ^{2,3}	$t_{\text{d}(\text{off})}$		-	51	97	
Fall Time ^{2,3}	t_f		-	13.8	26	
Source-Drain Ratings and Characteristics						
Continuous Source Current	I_{S}	$V_{\text{G}}=V_{\text{D}}=0\text{V}$, Force Current	-	-	-4.9	A
Pulsed Source Current	I_{SM}		-	-	-19	A
Diode Forward Voltage	V_{SD}	$V_{\text{GS}}=0\text{V}, I_{\text{S}}=-1\text{A}, T_J=25^\circ\text{C}$	-	-	-1	V

Notes

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width $\leq 300\mu\text{S}$, duty cycle $\leq 2\%$.
3. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

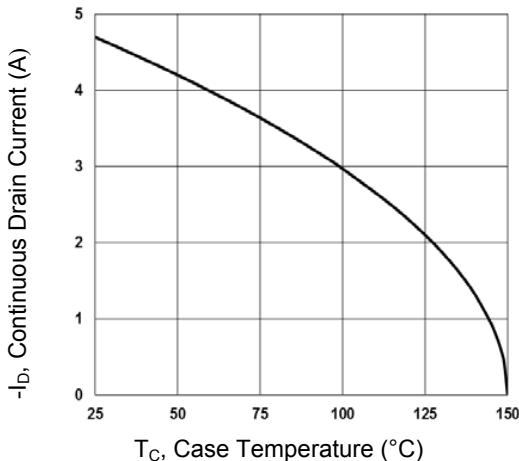


Figure 1. Continuous Drain Current vs. T_c

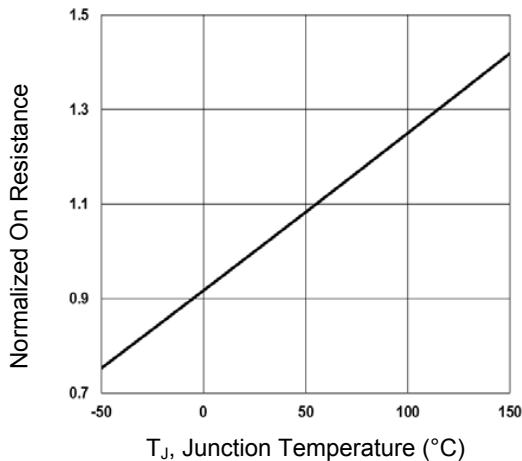


Figure 2. Normalized R_{DS(ON)} vs. T_j

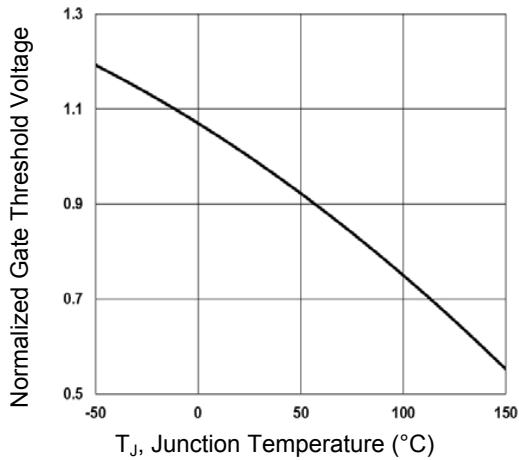


Figure 3. Normalized V_{th} vs. T_j

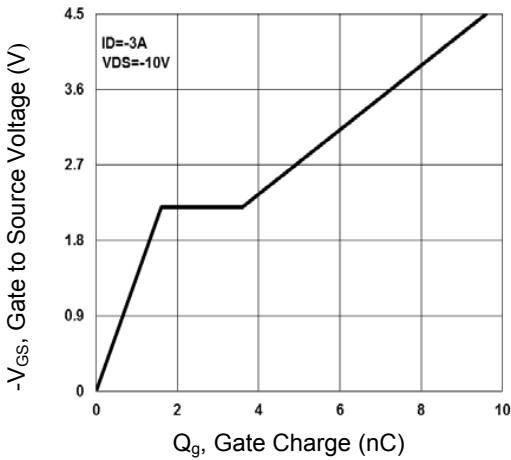


Figure 4. Gate Charge Waveform

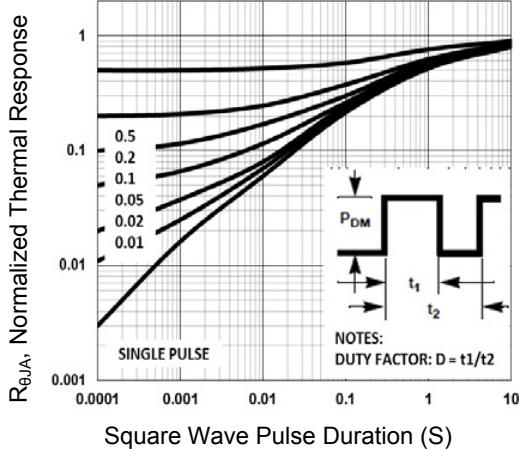


Figure 5. Normalized Transient Response

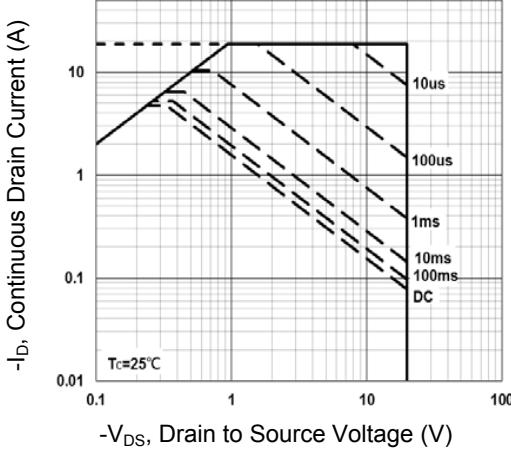


Figure 6. Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

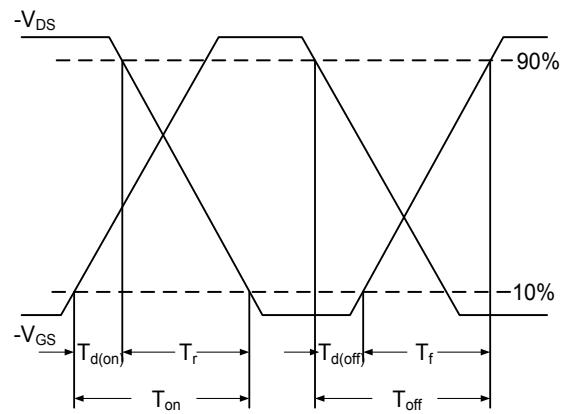


Figure 7. Switching Time Waveform

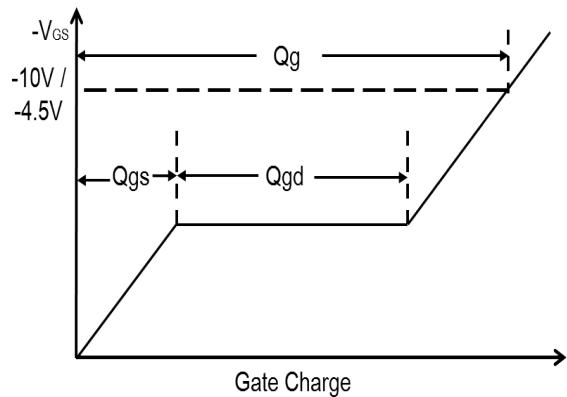
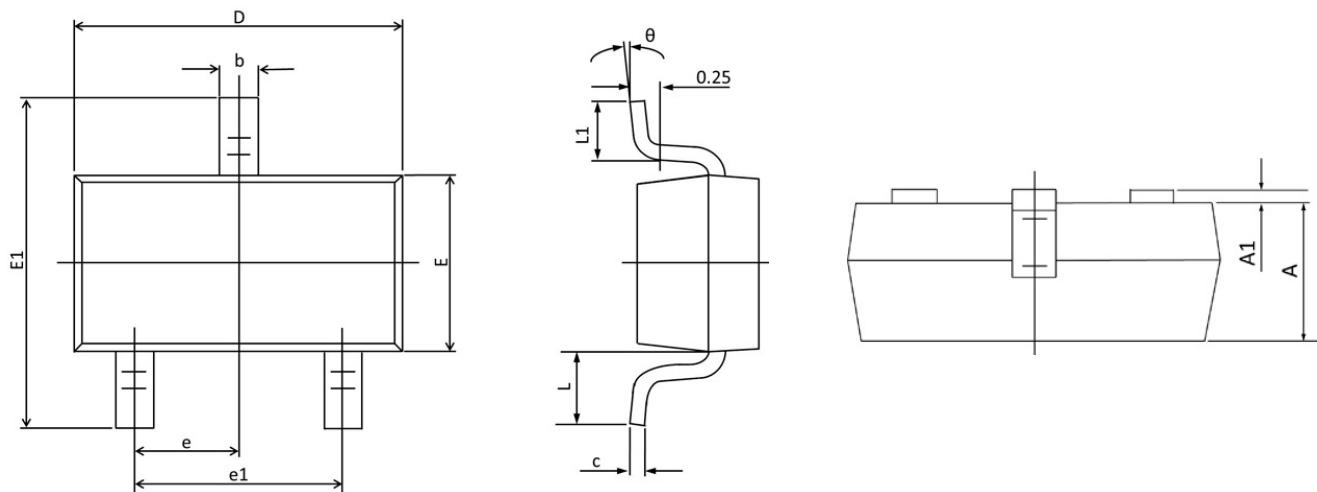


Figure 8. Gate Charge Waveform

Package Outline Dimensions (SOT-23)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.039
A1	0.000	0.100	0.000	0.004
b	0.300	0.500	0.012	0.020
c	0.090	0.110	0.003	0.004
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.95 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.55 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	1°	7°	1°	7°

Order Information

Device	Package	Marking Code	Carrier	Quantity	HSF Status
GSFC02R41	SOT-23	S	Tape & Reel	3,000pcs/Reel	RoHS Compliant