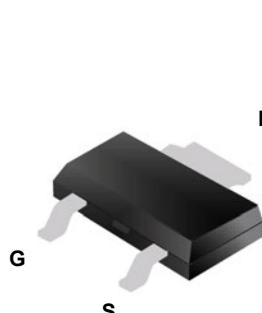
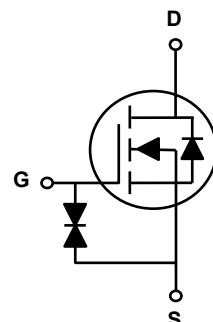


Main Product Characteristics

$V_{(BR)DSS}$	700V
$R_{DS(ON)}$	1.5Ω (Max.)
I_D	5A



SOT-223



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 GSFL70R1K5 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	Parameter.	Unit
Drain-Source Voltage	V_{DS}	700	V
Gate-to-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current, @ Steady-State ($T_C=25^\circ\text{C}$)	I_D	5	A
Continuous Drain Current, @ Steady-State ($T_C=100^\circ\text{C}$)		3.2	A
Pulsed Drain Current	I_{DM}	12	A
Power Dissipation ($T_C=25^\circ\text{C}$)	P_D	8.3	W
		0.066	W/ $^\circ\text{C}$
Single Pulse Avalanche Energy ¹	E_{AS}	158	mJ
Body Diode Reverse Voltage Slope ²	dv/dt	15	V/ns
MOS dv/dt Reggedness ³		50	V/ns
Junction-to-Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	62.5	$^\circ\text{C}/\text{W}$
Junction-to-Case	$R_{\theta JC}$	15	$^\circ\text{C}/\text{W}$
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	$V_{(\text{BR})\text{DSS}}$	$V_{\text{GS}}=0\text{V}, I_D=250\mu\text{A}$	700	-	-	V
Drain-to-Source Leakage Current	I_{DSS}	$V_{\text{DS}}=700\text{V}, V_{\text{GS}}=0\text{V}$	-	-	1	μA
Gate-to-Source Forward Leakage	I_{GSS}	$V_{\text{DS}}=0\text{V}, V_{\text{GS}}=20\text{V}$	-	-	1	μA
		$V_{\text{DS}}=0\text{V}, V_{\text{GS}}=-20\text{V}$	-	-	-1	
Static Drain-to-Source On-Resistance	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}}=10\text{V}, I_D=1\text{A}, T_J=25^\circ\text{C}$	-	1.34	1.5	Ω
		$V_{\text{GS}}=10\text{V}, I_D=1\text{A}, T_J=125^\circ\text{C}$	-	2.23	-	Ω
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{DS}}=V_{\text{GS}}, I_D=250\mu\text{A}$	2.0	-	4.0	V
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	$V_{\text{GS}}=0\text{V}, V_{\text{DS}}=100\text{V}, F=1\text{MHz}$	-	189	-	pF
Output Capacitance	C_{oss}		-	12	-	
Reverse Transfer Capacitance	C_{rss}		-	0.85	-	
Total Gate Charge ^{4,5}	Q_g	$I_D=1.5\text{A}, V_{\text{DD}}=480\text{V}, V_{\text{GS}}=10\text{V}$	-	8.6	-	nC
Gate-to-Source Charge ^{4,5}	Q_{gs}		-	1.6	-	
Gate-to-Drain ("Miller") Charge ^{4,5}	Q_{gd}		-	4.3	-	
Turn-on Delay Time ^{4,5}	$t_{\text{d}(\text{on})}$	$V_{\text{DD}}=400\text{V}, V_{\text{GS}}=10\text{V}, R_G=10.3\Omega, I_D=1.5\text{A}$	-	4.1	-	nS
Rise Time ^{4,5}	t_r		-	21.3	-	
Turn-Off Delay Time ^{4,5}	$t_{\text{d}(\text{off})}$		-	22.2	-	
Fall Time ^{4,5}	t_f		-	26.9	-	
Gate Resistance	R_g	$F=1\text{MHz}$	-	7.8	-	Ω
Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	$T_C=25^\circ\text{C}$, MOSFET symbol showing the integral reverse p-n junction diode.	-	-	5	A
Source Pulse Current	I_{SM}		-	-	12	A
Diode Forward Voltage	V_{SD}	$I_S=2\text{A}, V_{\text{GS}}=0\text{V}$	-	-	1.4	V
Reverse Recovery Time ³	T_{rr}	$I_F=1.5\text{A}, V_{\text{GS}}=0\text{V}, d_I/d_t=100\text{A}/\mu\text{s}$	-	151	-	nS
Reverse Recovery Charge ³	Q_{rr}		-	0.82	-	μC

Notes:

1. $L=79\text{mH}, I_{AS}=2.0\text{A}, V_{\text{DD}}=100\text{V}$, starting temperature $T_J=25^\circ\text{C}$.
2. $V_{\text{DS}}=0-400\text{V}, I_{SD}<=3\text{A}, T_J=25^\circ\text{C}$.
3. $V_{\text{DS}}=0-480\text{V}$.
4. Pulse test : pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
5. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

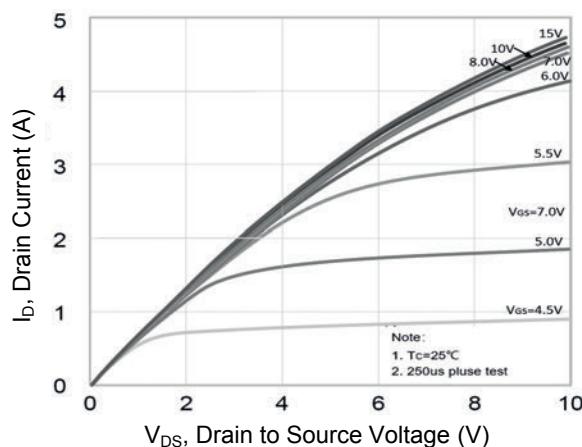


Figure 1. Typical Output Characteristics

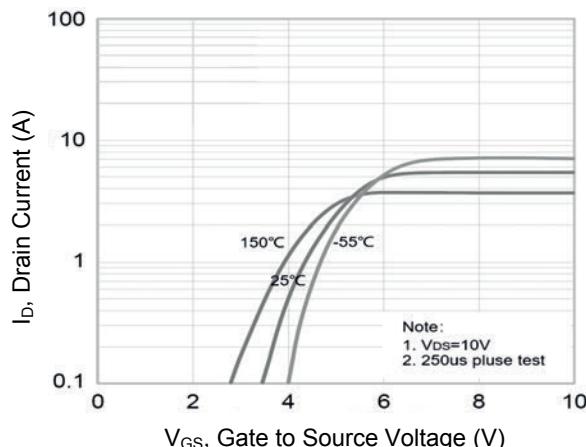


Figure 2. Transfer Characteristics

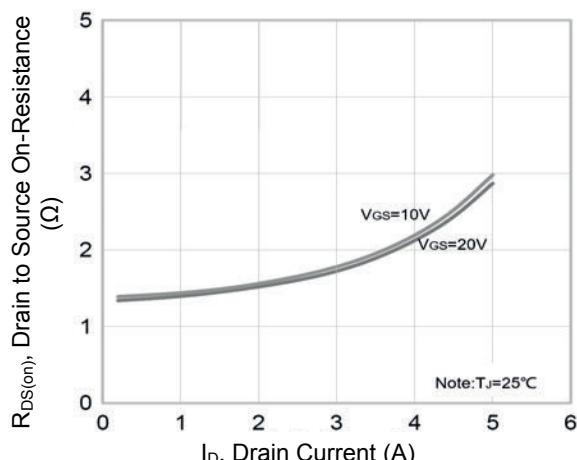


Figure 3. $R_{DS(\text{on})}$ Vs. Drain Current

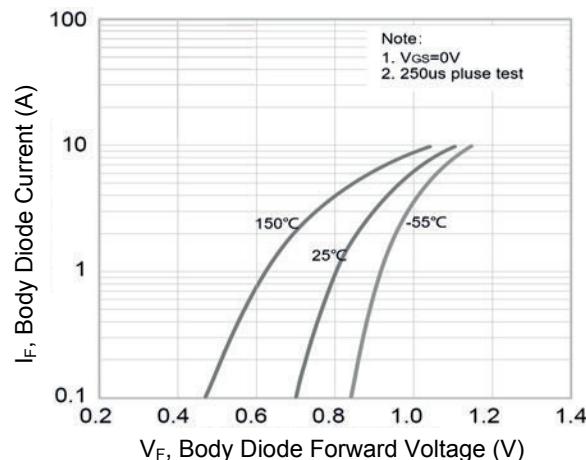


Figure 4. Body Diode Characteristics

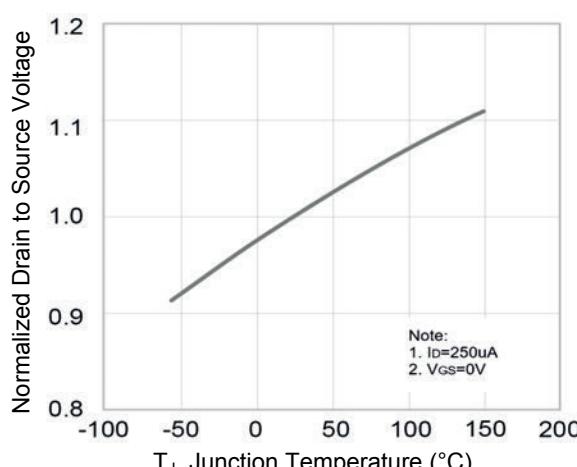


Figure 5. Normalized BV_{DSS} Vs. T_J

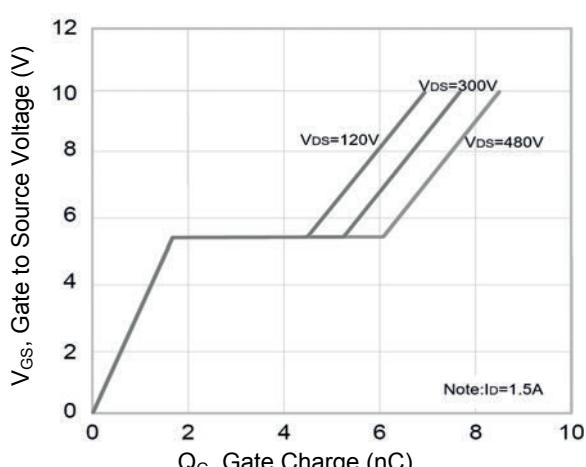


Figure 6. Gate Charge

Typical Electrical and Thermal Characteristic Curves

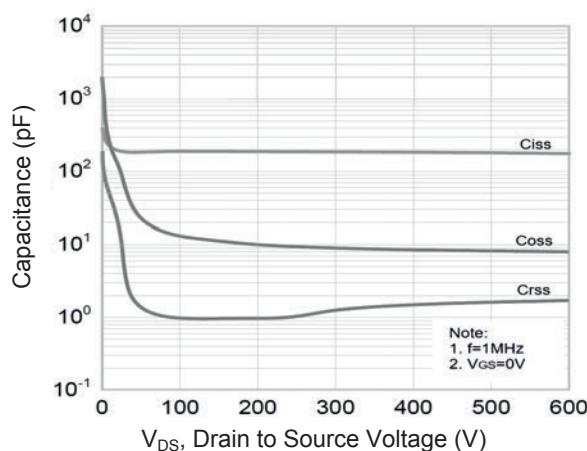


Figure 7. Capacitance Characteristics

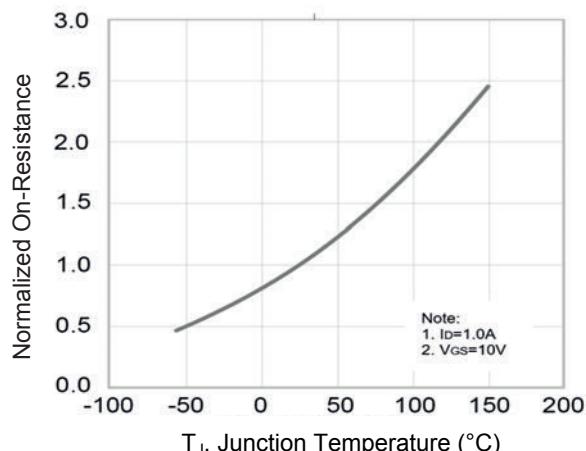


Figure 8. Normalized $R_{DS(ON)}$ Vs. T_J

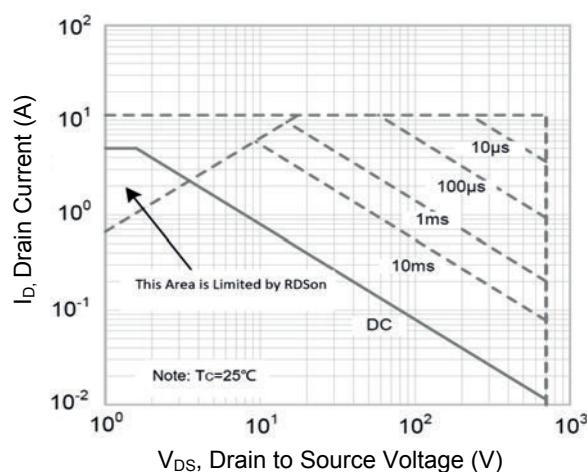
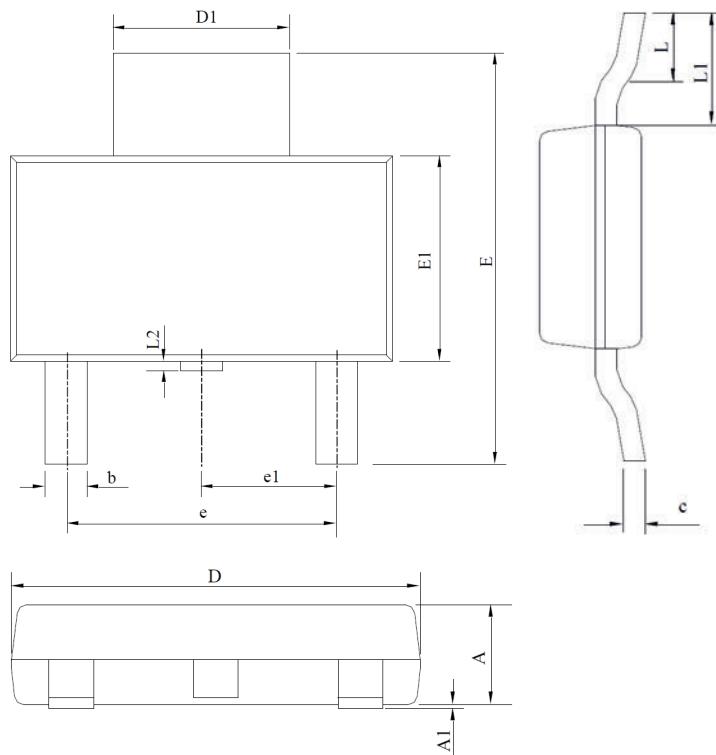


Figure 9. Safe Operation Area

Package Outline Dimensions (SOT-223)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.50	1.80	0.059	0.071
A1	0.01	0.10	0.000	0.004
b	0.60	0.80	0.024	0.031
c	0.22	0.32	0.009	0.013
D	6.30	6.70	0.248	0.264
D1	2.90	3.10	0.114	0.122
E	6.70	7.30	0.264	0.287
E1	3.30	3.70	0.130	0.146
e	4.60 BSC		0.181 BSC	
e1	2.30 BSC		0.091 BSC	
L	0.70	1.10	0.028	0.043
L1	1.50	2.00	0.059	0.079
L2	0.00	0.20	0.000	0.008