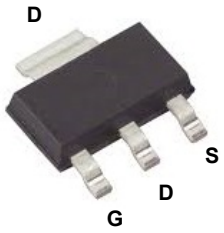
GOOD-ARK SEMICONDUCTOR

GSFL0607

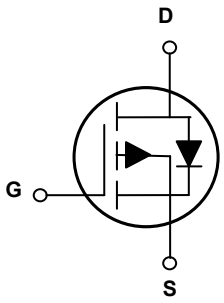
60V P-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	-60V
$R_{DS(ON)}$	170mΩ (Max.)
I_D	-7A



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 GSFL0607 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}	-60	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current (T_C=25°C)	I_D	-7	A
Drain Current (T_C=100°C)	I_D	-4.9	A
Peak Drain Current, Pulsed[1]	I_{DM}	-15	A
Avalanche Current	I_{AS}	-9.3	A
Single Pulse Avalanche Energy[2]	E_{AS}	4.3	mJ
Total Power Dissipation (T_C=25°C)	P_{tot}	12.5	W
Max. Thermal Resistance from Junction to Case	$R_{\theta JC}$	12	°C/W
Max. Thermal Resistance from Junction to Ambient[3]	$R_{\theta JA}$	65	°C/W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to +175	°C

Notes:

1. Pulse test: Pulse width ≤100us, duty cycle ≤2%, repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=175°C.
2. Limited by $T_{J(MAX)}$, starting T_J=25°C, L=0.1mH, R_g=25Ω, I_{AS}=-9.3A, V_{GS}=10V.
3. Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate in still air.

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=-250μA	-60	-	-	V
Drain-Source On-State Current	I_{DSS}	V_{DS}=-60V	-	-	-1	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V	-	-	±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-2	-	-4	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-5A	-	-	170	mΩ
Forward Transconductance	gfs	V_{DS}=-5V, I_D=-4A	-	5.5	-	S
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-30V, f=1MHz	-	361	-	pF
Output Capacitance	C_{oss}		-	25	-	
Reverse Transfer Capacitance	C_{rss}		-	20	-	
Total Gate Charge	Q_g	V_{GS}=-10V, V_{DS}=-30V, I_D=-5A	-	7	-	nC
Gate-Source Charge	Q_{gs}		-	1.6	-	
Gate-Drain Charge	Q_{gd}		-	1.3	-	
Turn-On Delay Time	$T_{d(on)}$	V_{GS}=-10V, V_{DD}=-30V, I_D=-5A, R_g=3.3Ω	-	5	-	nS
Turn-On Rise Time	T_r		-	3	-	
Turn-Off Delay Time	$T_{d(off)}$		-	7.5	-	
Turn-Off Fall Time	T_f		-	1	-	
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V, f=1MHz	-	9.2	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	V_{SD}	I_S=-1A, V_{GS}=0V	-	-	-1.2	V
Body-Diode Continuous Current	I_S	-	-	-	-7	A
Body-Diode Continuous Current, Pulsed	I_{SM}	-	-	-	-15	A
Body Diode Reverse Recovery Time	t_{rr}	I_S=-5A, di/dt=100A/μs	-	8	-	nS
Body Diode Reverse Recovery Charge	Q_{rr}		-	3.6	-	nC

Typical Electrical and Thermal Characteristic Curves

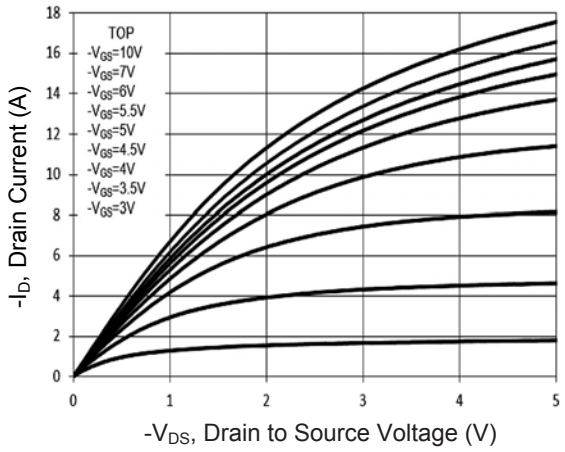


Figure 1. Typical Output Characteristics

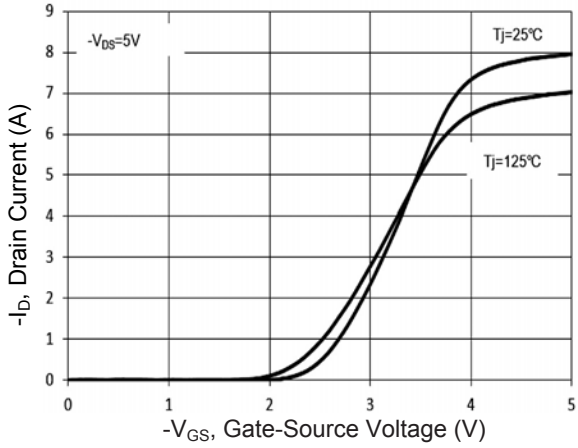


Figure 2. Typical Transfer Characteristics

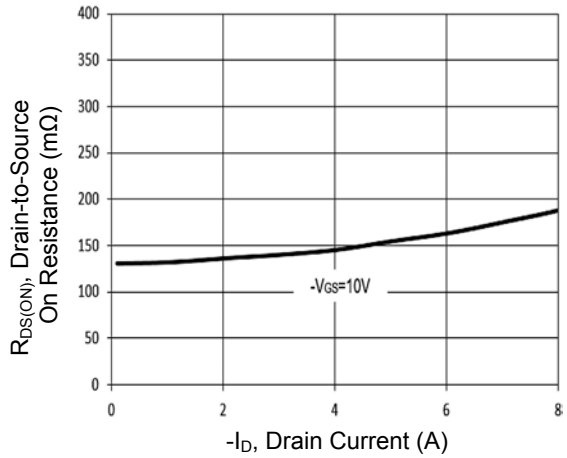


Figure 3. On-Resistance vs. Drain Current

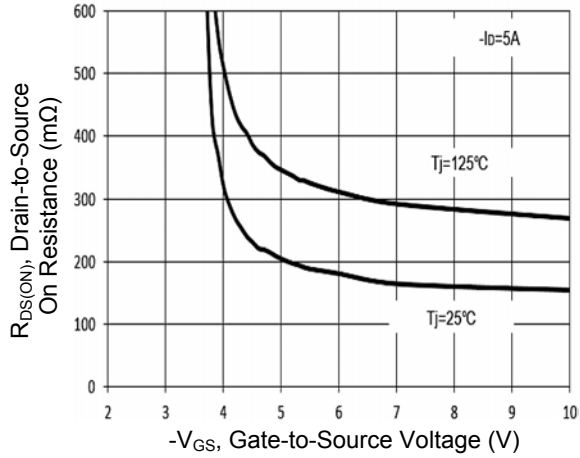


Figure 4. On-Resistance vs. Gate to Source Voltage

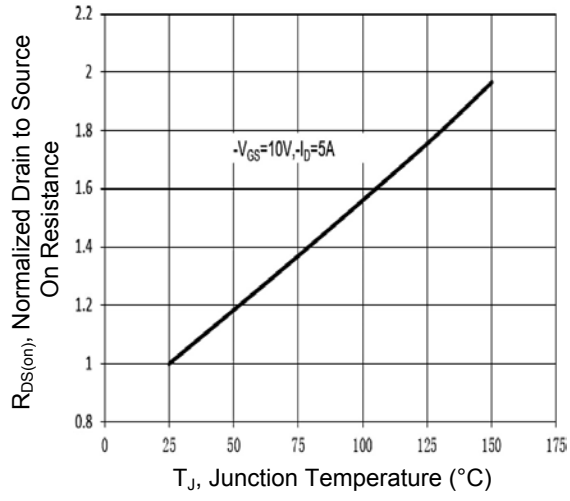


Figure 5. $R_{DS(ON)}$ vs. T_J

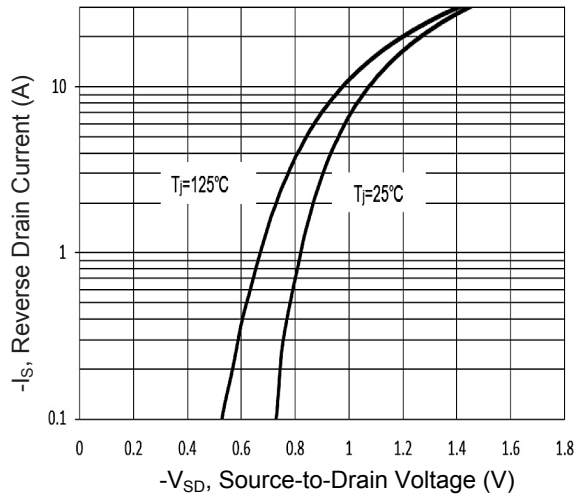


Figure 6. Typical Body-Diode Forward Characteristics

Typical Electrical and Thermal Characteristic Curves

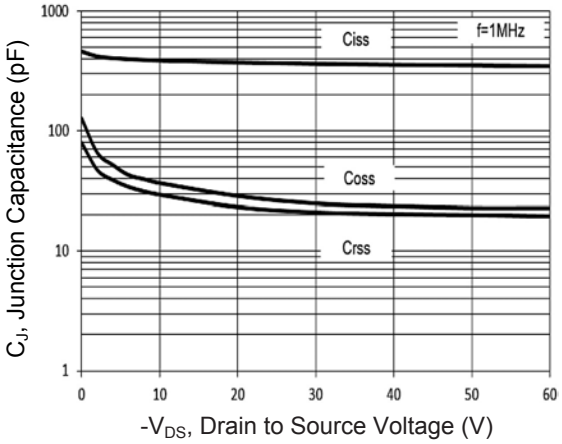


Figure 7. Typical Junction Capacitance

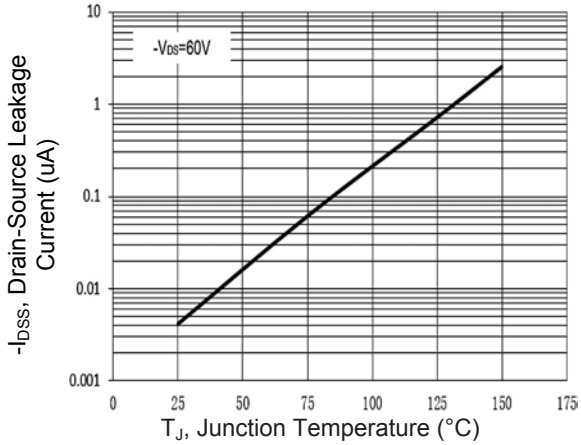


Figure 8. Drain-Source Leakage Current vs. T_J

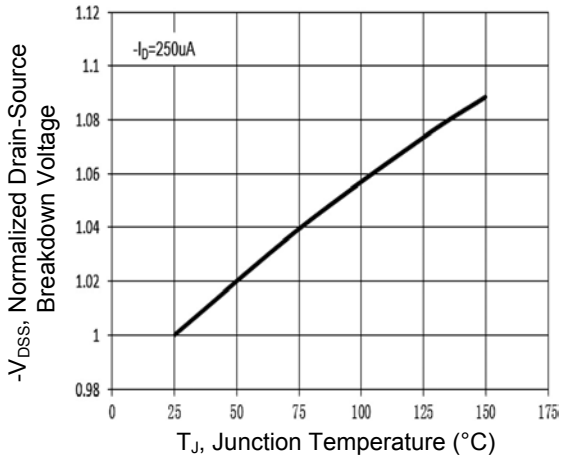


Figure 9. $V_{(BR)DSS}$ vs. Junction Temperature

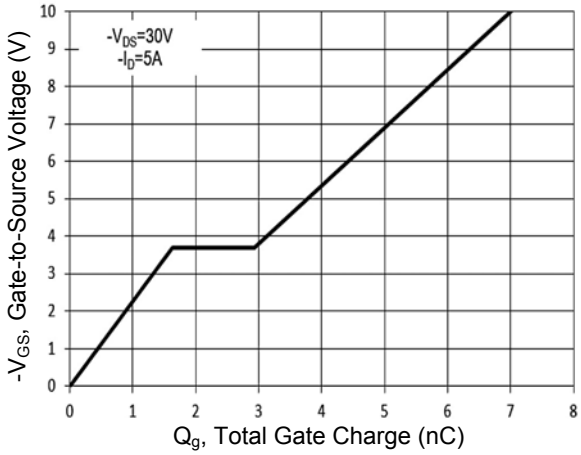


Figure 10. Gate Charge

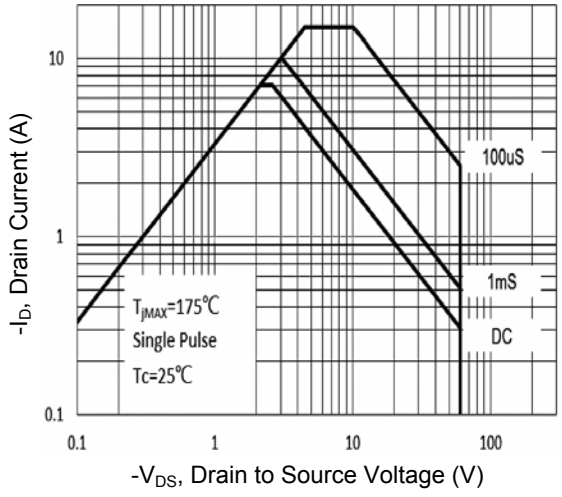


Figure 11. Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

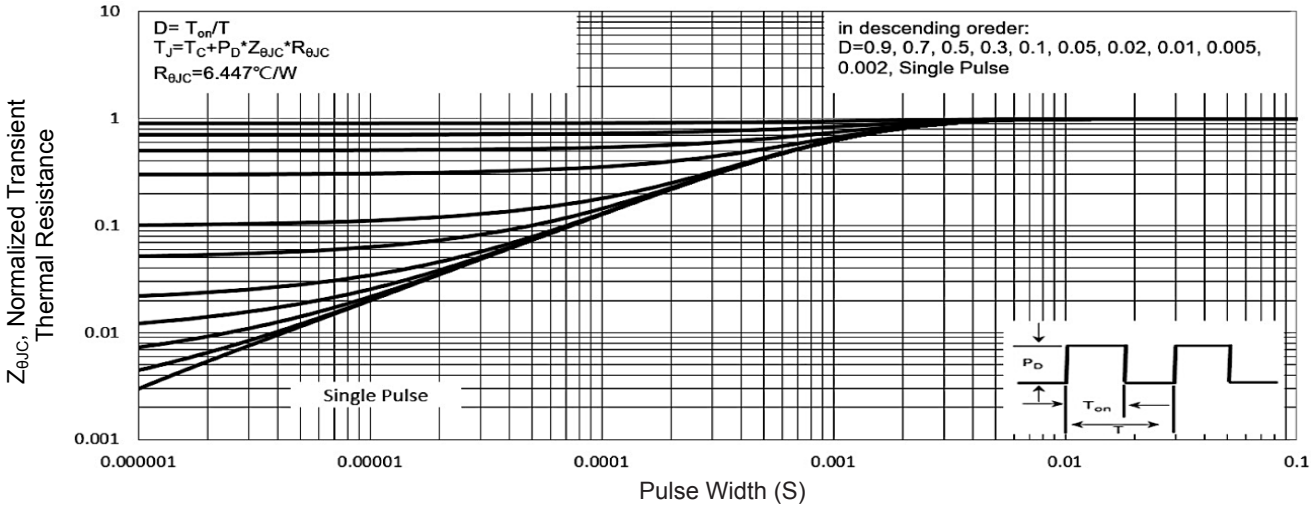


Figure 12. Normalized Maximum Transient Thermal Impedance ($Z_{\theta JC}$)

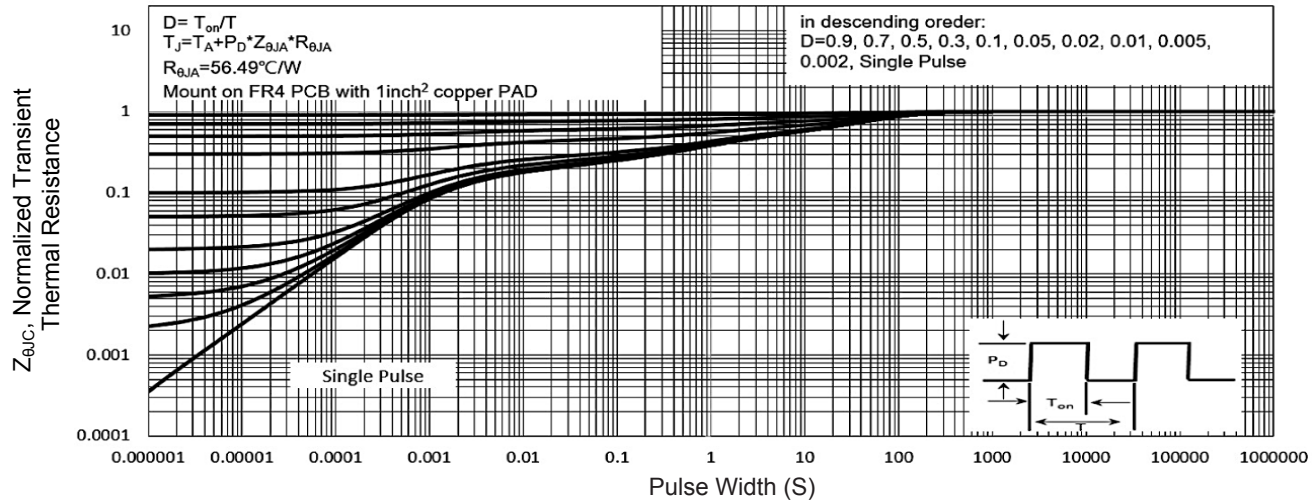
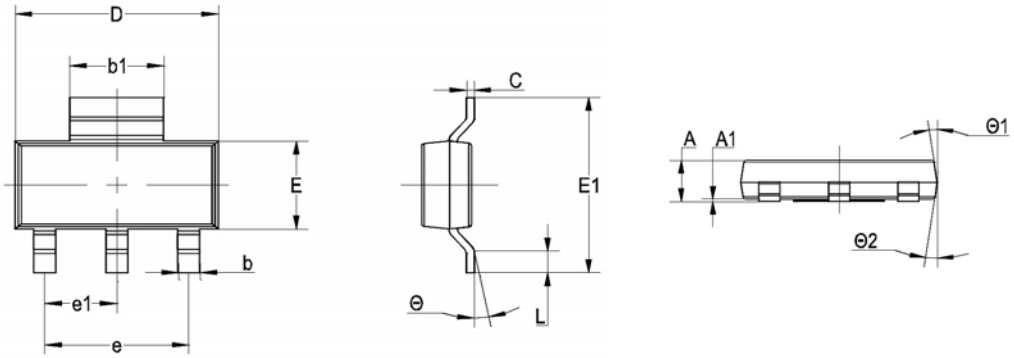


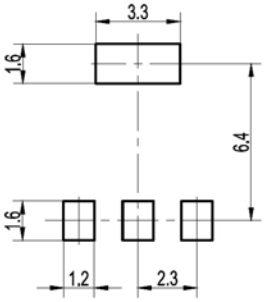
Figure 13. Normalized Maximum Transient Thermal Impedance ($Z_{\theta JA}$)

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	0.00	0.10	0.000	0.004
b	0.60	0.80	0.024	0.031
b1	2.90	3.10	0.114	0.122
C	0.22	0.32	0.009	0.013
D	6.30	6.70	0.248	0.264
E	3.30	3.70	0.130	0.146
E1	6.70	7.30	0.264	0.287
e	4.60 TYP		0.181 TYP	
e1	2.30 TYP		0.091 TYP	
L	0.70	1.10	0.028	0.043
θ	0°	10°	0°	10°
θ1	0°	7°	0°	7°
θ2	0°	7°	0°	7°

Recommended Pad Layout



Unit: mm

Order Information

Device	Package	Marking	Carrier	Quantity
GSFL0607	SOT-223	TQ06P1K7SS	Tape & Reel	3,000 Pcs / Reel