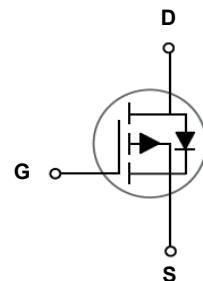
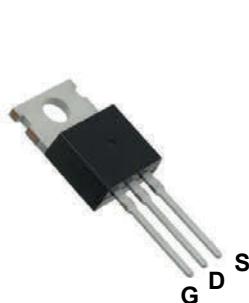


Main Product Characteristics

$V_{(BR)DSS}$	-60V
$R_{DS(ON)}$	17mΩ (max.)
I_D	-70A



Schematic Diagram

Features and Benefits

TO-220

- 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 GSFH6017 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 ($T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous ($T_C=25^\circ\text{C}$), $V_{GS}=10\text{V}^1$	I_D	-70	A
Drain Current-Continuous ($T_C=100^\circ\text{C}$), $V_{GS}=10\text{V}^1$		-55	A
Drain Current-Pulsed ²	I_{DM}	-280	A
Pulsed Source Current (Body Diode) ²	I_{SM}	-280	A
Maximum Power Dissipation ($T_C=25^\circ\text{C}$) ³	P_D	170	W
Single Pulse Avalanche Energy ($L=0.3\text{mH}$)	E_{AS}	300	mJ
Single Pulse Avalanche Current ($L=0.3\text{mH}$)	I_{AS}	44	A
Junction-to-Ambient ($t \leq 10\text{s}$) ⁴	$R_{\theta JA}$	62	°C/W
Maximum Junction-to-Case ⁵	$R_{\theta JC}$	0.73	°C/W
Operating Junction Temperature Range	T_J	-55 To +150	°C
Storage Temperature Range	T_{STG}	-55 To +150	°C

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{\text{GS}}=0\text{V}, I_{\text{D}}=-250\mu\text{A}$	-60	-	-	V
Drain-to-Source Leakage Current	$I_{\text{DS}(\text{SS})}$	$V_{\text{DS}}=-60\text{V}, V_{\text{GS}}=0\text{V}$	-	-	-1	μA
Drain-to-Source Leakage Current		$V_{\text{DS}}=-60\text{V}, V_{\text{GS}}=0\text{V} T_J=125^\circ\text{C}$	-	-	-50	μA
Gate-to-Source Leakage Current	I_{GS}	$V_{\text{GS}}=\pm 20\text{V}, V_{\text{DS}}=0\text{V}$	-	-	± 100	nA
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{GS}}=V_{\text{DS}}, I_{\text{D}}=-250\mu\text{A}$	-1	-	-3	V
Drain Static-Source On-Resistance	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}}=-10\text{V}, I_{\text{D}}=-23\text{A}$	-	12	17	$\text{m}\Omega$
		$V_{\text{GS}}=-4.5\text{V}, I_{\text{D}}=-10\text{A}$	-	17	27	$\text{m}\Omega$
Dynamic and Switching Characteristics						
Total Gate Charge	Q_g	$V_{\text{DD}}=-40\text{V}, I_{\text{D}}=-30\text{A}$ $V_{\text{GS}}=-10\text{V}$	-	110	150	nC
Gate-Source Charge	Q_{gs}		-	16.5	30	
Gate-Drain Charge	Q_{gd}		-	23.2	40	
Turn-On Delay Time	$t_{\text{d}(\text{on})}$	$V_{\text{DD}}=-30\text{V}, R_G=3\Omega$ $R_L=1.5\Omega, V_{\text{GS}}=-10\text{V}, I_{\text{D}}=-20\text{A}$	-	8	-	nS
Rise Time	t_r		-	26.5	-	
Turn-Off Delay Time	$t_{\text{d}(\text{off})}$		-	105.2	-	
Fall Time	t_f		-	142.1	-	
Input Capacitance	C_{iss}	$V_{\text{DS}}=-25\text{V}, V_{\text{GS}}=0\text{V}, F=1\text{MHz}$	-	4802	-	pF
Output Capacitance	C_{oss}		-	288	-	
Reverse Transfer Capacitance	C_{rss}		-	273	-	
Gate Resistance	R_g	$F=1\text{MHz}$	-	5.56	-	Ω
Source-Drain Ratings and Characteristics						
Maximum Body-Diode Continuous Current	I_s	MOSFET symbol showing the integral reverse p-n junction diode.	-	-70	-	A
Maximum Body-Diode Pulse Current	I_{SM}		-	-280	-	A
Diode Forward Voltage	V_{SD}	$V_{\text{GS}}=0\text{V}, I_s=-10\text{A}, T_J=25^\circ\text{C}$	-	-0.74	-1.2	V
Reverse Recovery Time	t_{rr}	$I_F=-20\text{A}, T_J=25^\circ\text{C}$ $dI/dt=100\text{A}/\mu\text{s}$	-	22.3	-	nS
Reverse Recovery Charge	Q_{rr}		-	21.5	-	nC

Note:

- Calculated continuous current based on maximum allowable junction temperature.
- Repetitive rating; pulse width limited by max. junction temperature.
- The power dissipation P_D is based on max. junction temperature, using junction-to-case thermal resistance.
- The value of $R_{\theta JA}$ is measured with the device mounted on 1inch² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$.

Typical Electrical and Thermal Characteristic Curves

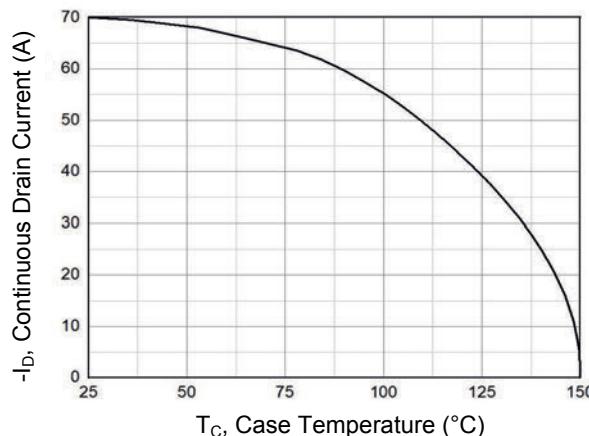


Figure 1. Continuous Drain Current vs. T_c

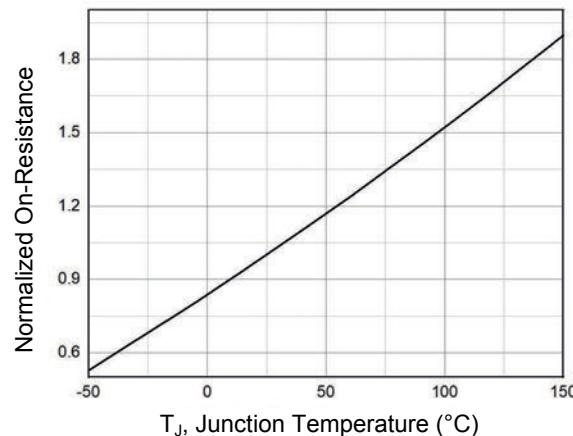


Figure 2. Normalized R_{DS(ON)} Vs. T_j

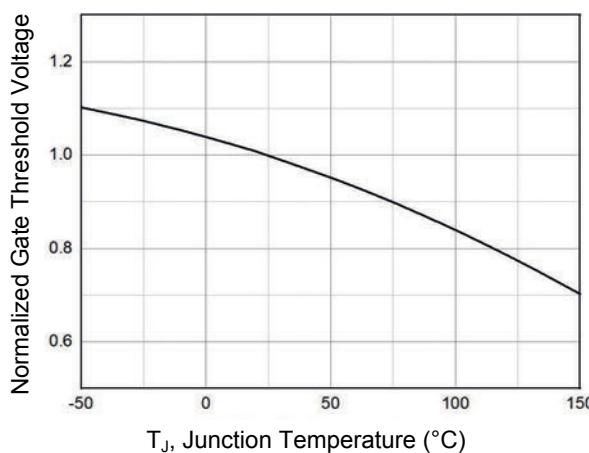


Figure 3. Normalized v_{th} Vs. T_j

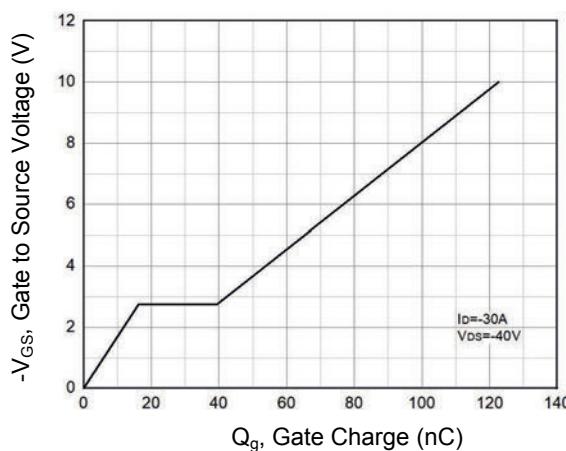


Figure 4. Gate Charge Waveform

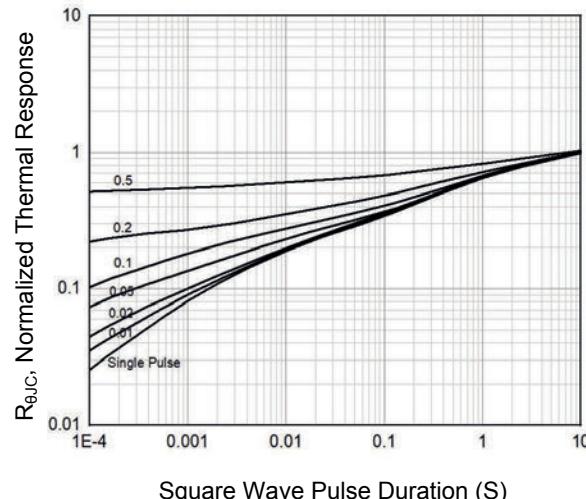


Figure 5. Normalized Transient Impedance

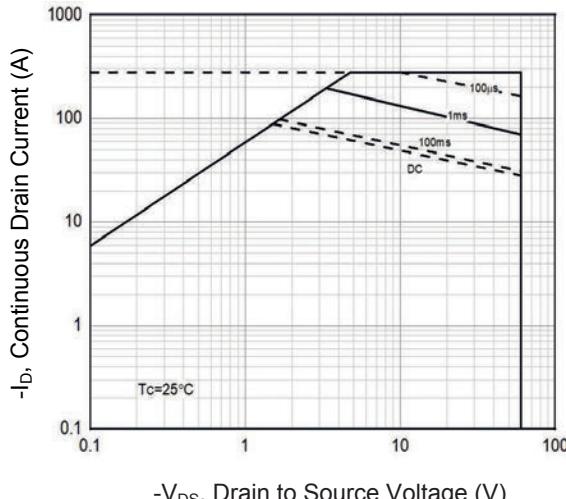
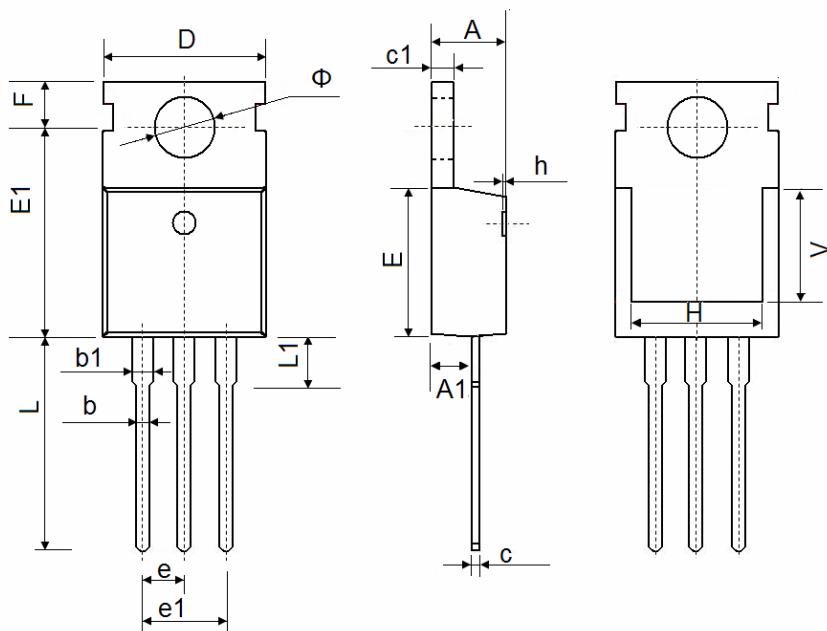


Figure 6. Maximum Safe Operation Area

Package Outline Dimensions (TO-220)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.9500	9.750	0.352	0.384
E1	12.650	12.950	0.498	0.510
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	6.900 REF.		0.276 REF.	
Φ	3.400	3.800	0.134	0.150