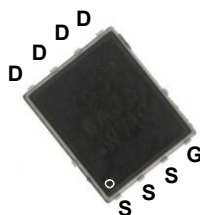
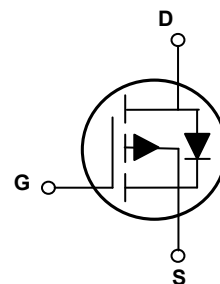


### Main Product Characteristics

$BV_{DSS}$	-60V
$R_{DS(ON)}$	24mΩ
$I_D$	-40A



PPAK5x6



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 GSFP0641 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 supply and a wide variety of other applications.

### Absolute Maximum Ratings ( $T_C=25^{\circ}C$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	$V_{DS}$	-60	V
Gate-Source Voltage	$V_{GS}$	±20	V
Drain Current-Continuous ( $T_C=25^{\circ}C$ )	$I_D$	-40	A
Drain Current-Continuous ( $T_C=100^{\circ}C$ )		-26	A
Drain Current-Pulsed <sup>1</sup>	$I_{DM}$	-160	A
Single Pulse Avalanche Energy <sup>2</sup>	$E_{AS}$	105	mJ
Single Pulse Avalanche Current <sup>2</sup>	$I_{AS}$	-46	A
Power Dissipation ( $T_C=25^{\circ}C$ )	$P_D$	96	W
Power Dissipation-Derate Above 25°C		0.77	W/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.3	°C/W
Storage Temperature Range	$T_{STG}$	-55 to +150	°C
Operating Junction Temperature Range	$T_J$	-55 to +150	°C

### Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA	-60	-	-	V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =-60V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	-	-	-1	μA
		V <sub>DS</sub> =-48V, V <sub>GS</sub> =0V, T <sub>J</sub> =125°C	-	-	-10	μA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±100	nA
<b>On Characteristics</b>						
Static Drain-Source On - Resistance	V <sub>GS(th)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-15A	-	20	24	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-10A	-	26	34	mΩ
Gate Threshold Voltage	ΔV <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA	-1.2	-1.6	-2.5	V
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> =-10V, I <sub>S</sub> =-5A	-	15	-	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>2,3</sup>	Q <sub>g</sub>	V <sub>DS</sub> =-30V, I <sub>D</sub> =-20A, V <sub>GS</sub> =-10V	-	43.8	66	nC
Gate-Source Charge <sup>2,3</sup>	Q <sub>gs</sub>		-	4.6	7	
Gate-Drain Charge <sup>2,3</sup>	Q <sub>gd</sub>		-	8.3	13	
Turn-On Delay Time <sup>2,3</sup>	T <sub>d(on)</sub>	V <sub>DD</sub> =-30V, R <sub>G</sub> =6Ω V <sub>GS</sub> =-10V, I <sub>D</sub> =-20A	-	25	38	nS
Rise Time <sup>2,3</sup>	T <sub>r</sub>		-	13.8	21	
Turn-Off Delay Time <sup>2,3</sup>	T <sub>d(off)</sub>		-	148	222	
Fall Time <sup>2,3</sup>	T <sub>f</sub>		-	51	77	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V, F=1MHz	-	2595	3893	pF
Output Capacitance	C <sub>oss</sub>		-	162	243	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	115	173	
Gate Resistance	R <sub>g</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz	-	8	-	Ω
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	I <sub>S</sub>	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	-	-	-40	A
Pulsed Source Current	I <sub>SM</sub>		-	-	-80	A
Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =-1A, T <sub>J</sub> =25°C	-	-	-1	V
Reverse Recovery Time	T <sub>rr</sub>	V <sub>R</sub> =-50V, I <sub>S</sub> =-10A di/dt=100A/μs, T <sub>J</sub> =25°C	-	40	-	nS
Reverse Recovery Charge	Q <sub>rr</sub>		-	30	-	nC

Note:

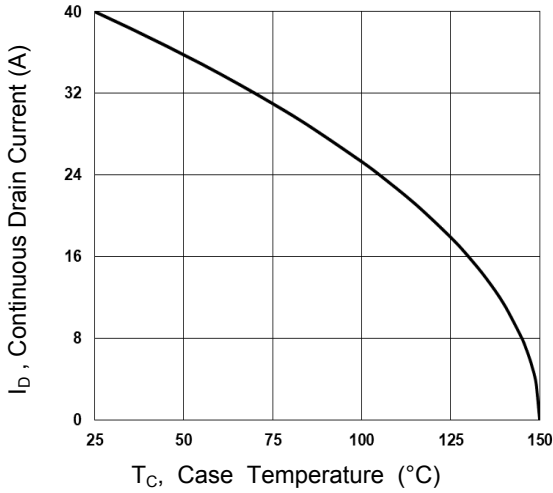
1. Repetitive rating: Pulsed width limited by maximum junction temperature.

2. V<sub>DD</sub>=-25V, V<sub>GS</sub>=-10V, L=0.1mH, I<sub>AS</sub>=-46A, starting T<sub>J</sub>=25°C.

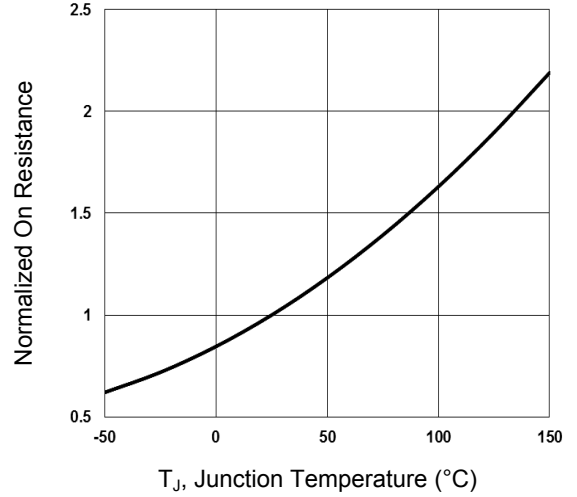
3. Pulse test: pulse width ≤ 300μs, duty cycle ≤ 2%.

4. Essentially independent of operating temperature.

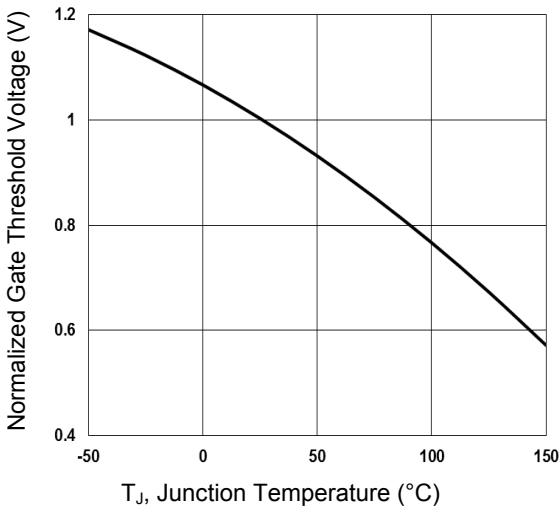
**Typical Electrical and Thermal Characteristic Curves**



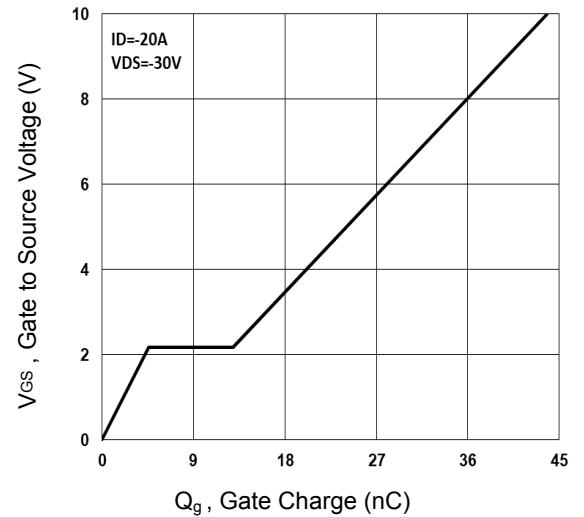
**Fig.1 Continuous Drain Current vs.  $T_C$**



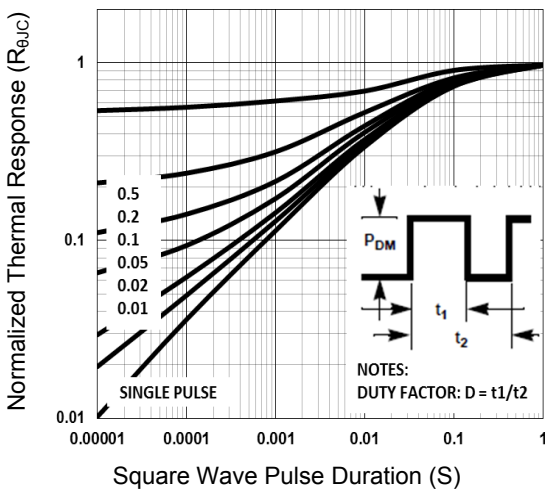
**Fig.2 Normalized  $R_{DS(ON)}$  vs.  $T_J$**



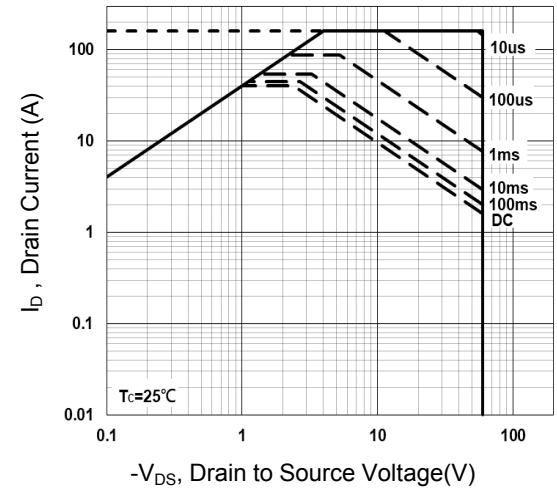
**Fig.3 Normalized  $V_{th}$  vs.  $T_J$**



**Fig.4 Gate Charge Characteristics**

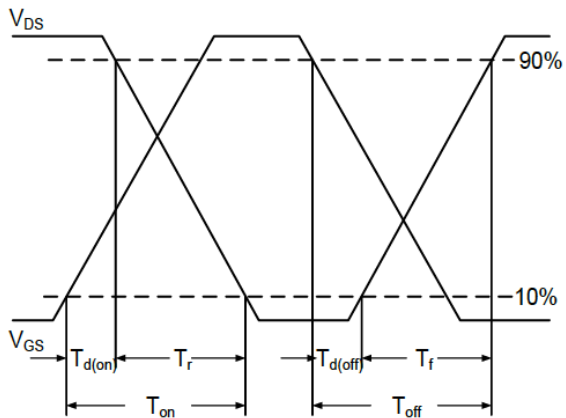


**Fig.5 Normalized Transient Impedance**

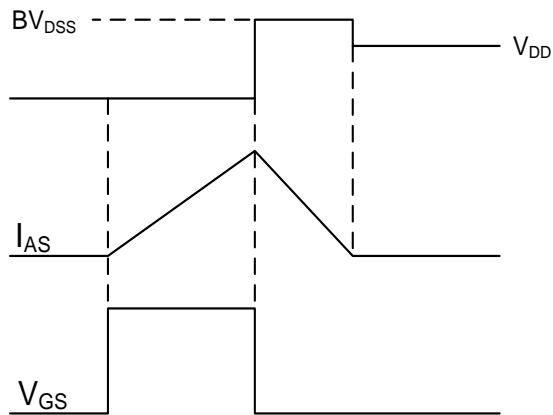


**Fig.6 Maximum Safe Operation Area**

**Typical Electrical and Thermal Characteristic Curves**



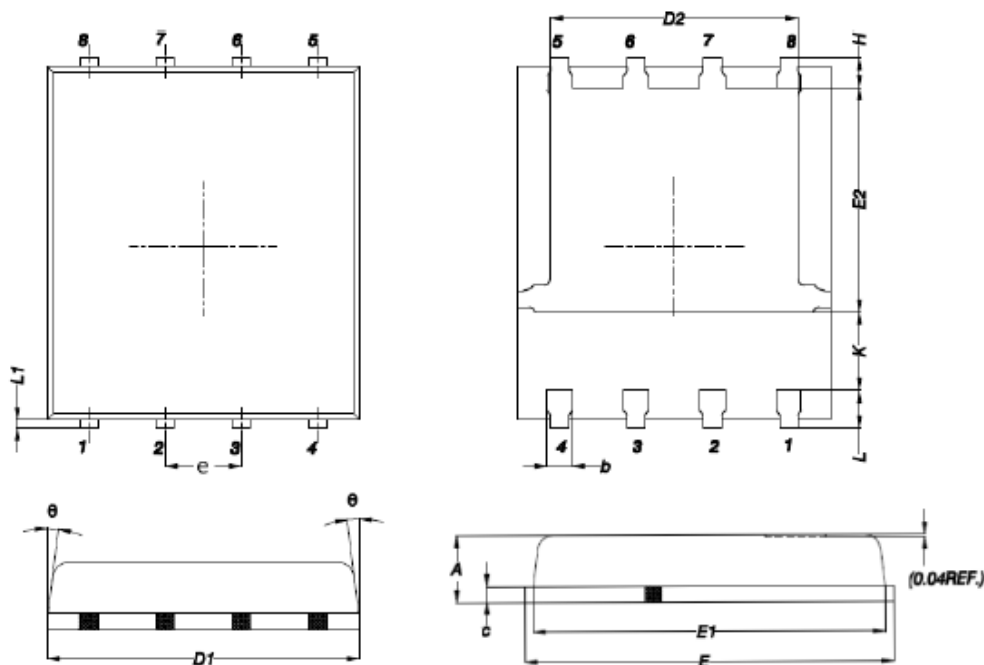
**Fig.7 Switching Time Waveform**



**Fig.8 EAS Waveform**

**Package Outline Dimensions**

**PPAK5x6**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.200	0.850	0.047	0.031
b	0.510	0.300	0.020	0.012
C	0.300	0.200	0.012	0.008
D1	5.400	4.800	0.212	0.189
D2	4.310	3.610	0.170	0.142
E	6.300	5.850	0.248	0.230
E1	5.960	5.450	0.235	0.215
E2	3.920	3.300	0.154	0.130
e	1.27BSC		0.05BSC	
H	0.650	0.380	0.026	0.015
K	-	1.100	-	0.043
L	0.710	0.380	0.028	0.015
L1	0.250	0.050	0.009	0.002
θ	12°	0°	12°	0°