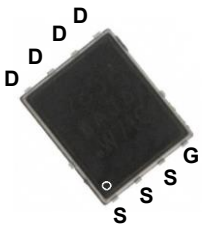
GOOD-ARK SEMICONDUCTOR

GSFP2601

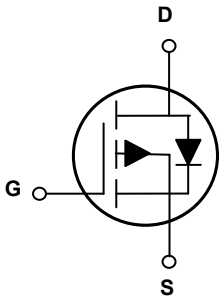
20V P-Channel MOSFET

Main Product Characteristics

BV_{DSS}	-20V
$R_{DS(ON)}$	2.3mΩ
I_D	-90A



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 GSFP2601 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°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current-Continuous(T_C=25°C)	I_D	-90	A
Drain Current-Continuous(T_C=100°C)		-54	A
Drain Current-Pulsed[1]	I_{DM}	-360	A
Power Dissipation(T_C=25°C)	P_D	41.67	W
Power Dissipation-Derate Above 25°C		0.33	W/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	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_J=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=-250μA	-20	-	-	V
BV_{DSS} Temperature Coefficient	$\triangle BV_{DSS}/\triangle T_J$	Reference to 25°C, I_D=-1mA	-	-0.008	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-20V, V_{GS}=0V, T_J=25°C	-	-	-1	μA
		V_{DS}=-16V, V_{GS}=0V, T_J=125°C	-	-	-30	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±12V, V_{DS}=0V	-	-	±500	nA
On Characteristics						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-20A	-	1.8	2.3	mΩ
		V_{GS}=-4.5V, I_D=-20A	-	2.1	2.6	
		V_{GS}=-2.5V, I_D=-20A	-	2.7	3.6	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-0.4	-0.6	-1.0	V
$V_{GS(th)}$ Temperature Coefficient	$\triangle V_{GS}$		-	-3.44	-	mV/°C
Forward Transconductance	g_{fs}	V_{DS}=-10V, I_D=-3A	-	30	-	S
Dynamic and Switching Characteristics						
Total Gate Charge[2,3]	Q_g	V_{DS}=-16V, I_D=-5A, V_{GS}=-4.5V	-	149	225	nC
Gate-Source Charge[2,3]	Q_{gs}		-	14.4	22	
Gate-Drain Charge[2,3]	Q_{gd}		-	42.8	65	
Turn-On Delay Time[2,3]	$t_{d(on)}$	V_{DD}=-15V, R_G=25Ω V_{GS}=-4.5V, I_D=-1A	-	21.2	42	nS
Rise Time[2,3]	t_r		-	20.6	40	
Turn-Off Delay Time[2,3]	$t_{d(off)}$		-	26	52	
Fall Time[2,3]	t_f		-	400	600	
Input Capacitance	C_{lss}	V_{DS}=-15V, V_{GS}=0V, F=1.0MHz	-	14000	21000	PF
Output Capacitance	C_{oss}		-	1670	2500	
Reverse Transfer Capacitance	C_{rss}		-	730	1100	
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V, F=1MHz	-	2.6	-	Ω
Drain-Source Diode Characteristics						
Continuous Source Current	I_S	V_G=V_D=0V, Force Current	-	-	-90	A
Pulsed Source Current	I_{SM}		-	-	-180	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=-1A, T_J=25°C	-	-	-1	V

Note :
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. Pulse test: pulse width ≦ 300us , duty cycle ≦ 2%.
3. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

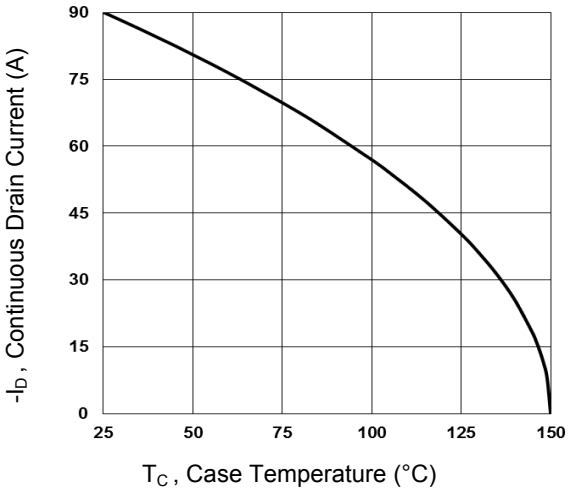


Figure 1. Continuous Drain Current vs. T_C

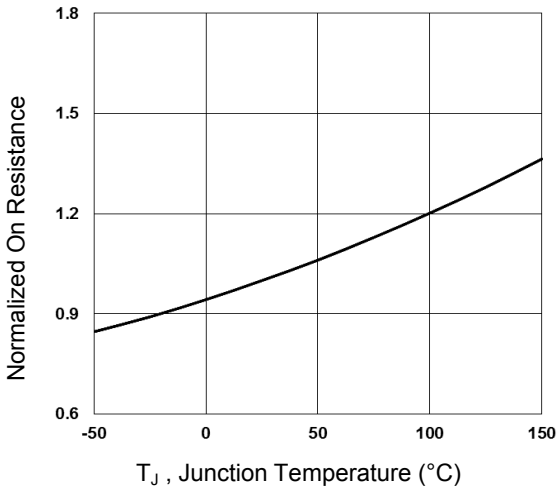


Figure 2. Normalized R_{DSON} vs. T_J

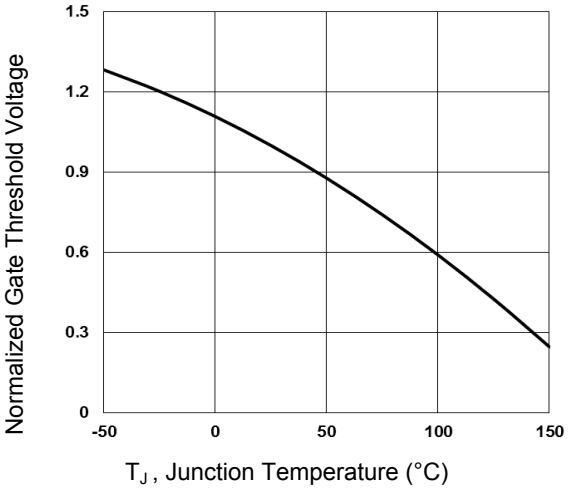


Figure 3. Normalized V_{th} vs. T_J

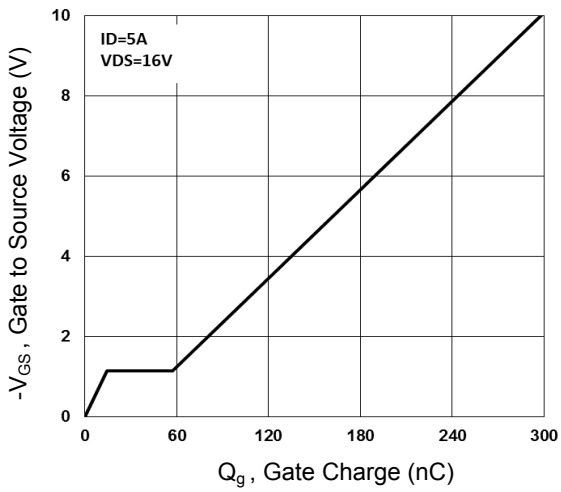


Figure 4. Gate Charge Waveform

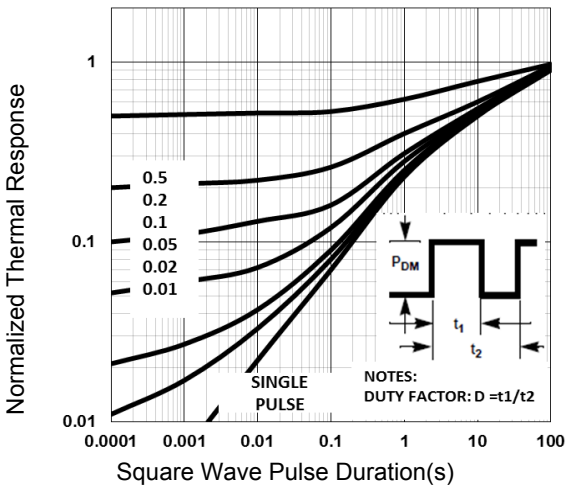


Figure 5. Normalized Transient Response

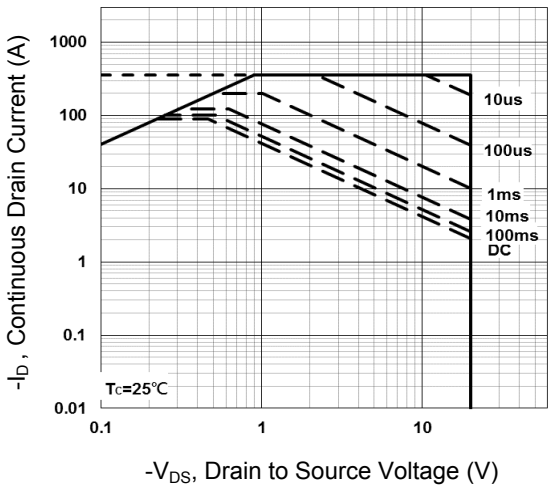
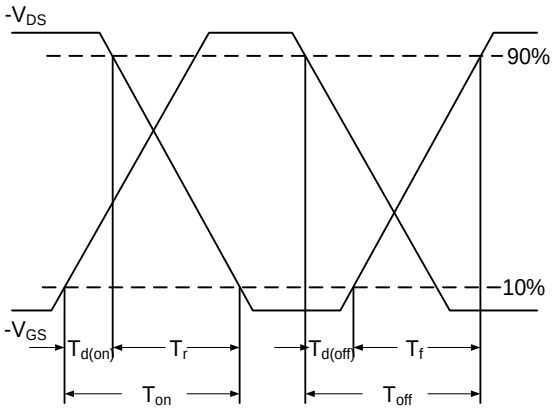
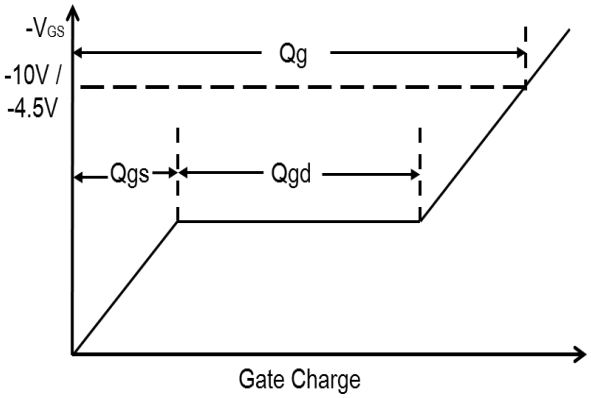


Figure 6. Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

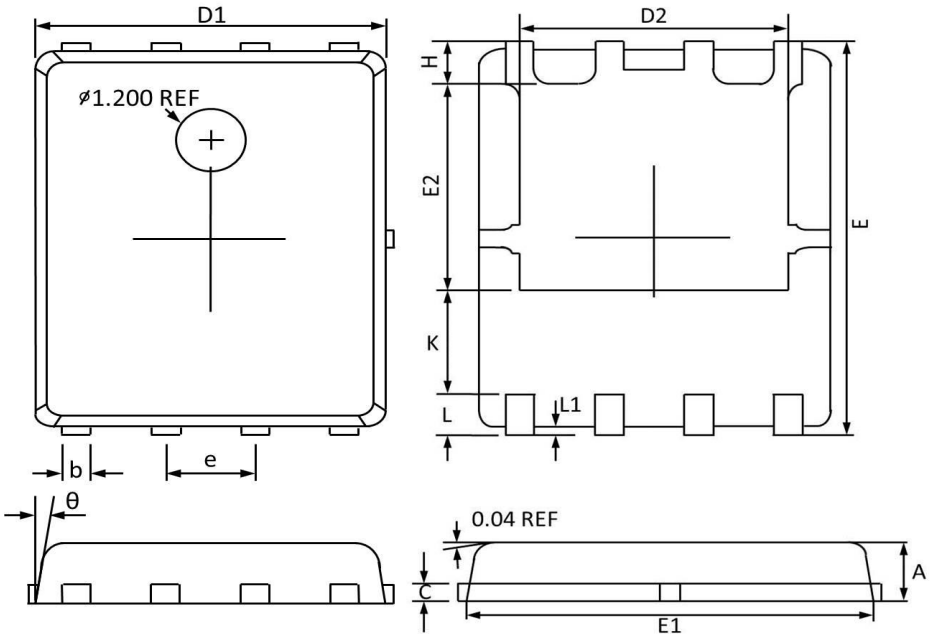


Firgure 7. Switching Time Waveform



Firgure 8. Gate Charge Waveform

Package Outline Dimensions (PPAK5x6)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.100	0.800	0.043	0.031
b	0.510	0.330	0.020	0.013
C	0.300	0.200	0.012	0.008
D1	5.100	4.800	0.201	0.189
D2	4.100	3.610	0.161	0.142
E	6.200	5.900	0.244	0.232
E1	5.900	5.700	0.232	0.224
E2	3.780	3.350	0.149	0.132
e	1.27BSC		0.05BSC	
H	0.700	0.410	0.028	0.016
K	1.500	1.100	0.059	0.043
L	0.710	0.510	0.028	0.020
L1	0.200	0.060	0.008	0.002
θ	12°	0°	12°	0°