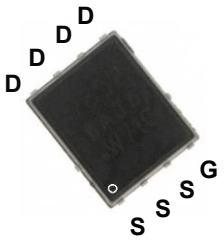
GOOD-ARK SEMICONDUCTOR

GSFP0625

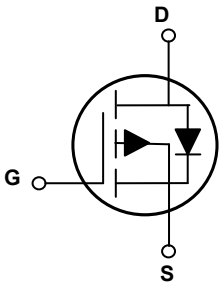
60V P-Channel MOSFET

Main Product Characteristics

BV_{DSS}	-60V
$R_{DS(ON)}$	47mΩ
I_D	-25A



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 GSFP0625 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}	-60	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous (T_C=25°C)	I_D	-25	A
Drain Current-Continuous (T_C=100°C)		-16	A
Drain Current-Pulsed[1]	I_{DM}	-100	A
Single Pulse Avalanche Energy[2]	E_{AS}	58	mJ
Single Pulse Avalanche Current[2]	IAS	-34	A
Power Dissipation (T_C=25°C)	P_D	72	W
Power Dissipation-Derate Above 25°C		0.578	W/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.73	°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	-60	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-60V , V_{GS}=0V, T_J=25°C	-	-	-1	μA
		V_{DS}=-48V , V_{GS}=0V, T_J=125°C	-	-	-10	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
On Characteristics						
Static Drain-Source On - Resistance	$R_{DS(on)}$	V_{GS}=-10V , I_D=-8A	-	41	47	mΩ
		V_{GS}=-4.5V , I_D=-6A	-	53	64	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-1.2	-1.6	-2.5	V
Forward Transconductance	g_{fs}	V_{DS}=-10V , I_S=-3A	-	11	-	S
Dynamic and Switching Characteristics						
Total Gate Charge[2,3]	Q_g	V_{DS}=-30V, I_D=-10A, V_{GS}=-10V	-	19	30	nC
Gate-Source Charge[2,3]	Q_{gs}		-	2.5	3.8	
Gate-Drain Charge[2,3]	Q_{gd}		-	4.3	6.5	
Turn-On Delay Time[2,3]	$T_{d(on)}$	V_{DD}=-30V, R_G=25Ω V_{GS}=-10V, I_D=-10A	-	25	40	nS
Rise Time[2,3]	T_r		-	58	95	
Turn-Off Delay Time[2,3]	$T_{d(off)}$		-	65	110	
Fall Time[2,3]	T_f		-	35	55	
Input Capacitance	C_{lss}	V_{DS}=-30V, V_{GS}=0V, F=1MHz	-	1200	1800	pF
Output Capacitance	C_{oss}		-	85	130	
Reverse Transfer Capacitance	C_{rss}		-	60	90	
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V, F=1MHz	-	14	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	V_G=V_D=0V , Force Current	-	-	-25	A
Pulsed Source Current	I_{SM}		-	-	-50	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V , I_S=-1A , T_J=25°C	-	-	-1	V
Reverse Recovery Time	T_{rr}	V_R=-50V, I_S=-10A di/dt=100A/μs, T_J=25°C	-	30	-	nS
Reverse Recovery Charge	Q_{rr}		-	20	-	nC

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. V_{DD}=-25V, V_{GS}=-10V, L=0.1mH, I_{AS}=-34A, starting T_J=25°C.
3. Pulse test: pulse width≤300us, duty cycle ≤2%.
4. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

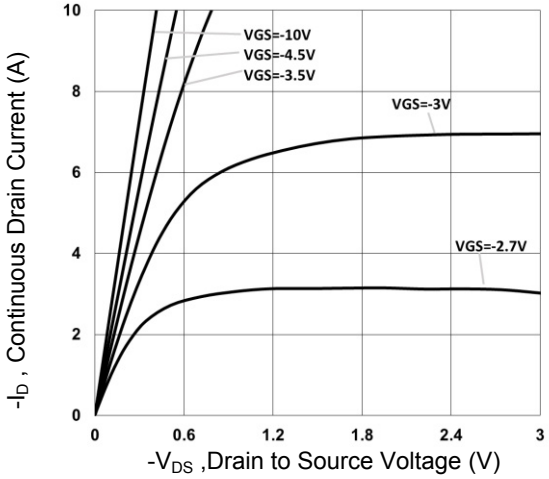


Fig.1 Typical Output Characteristics

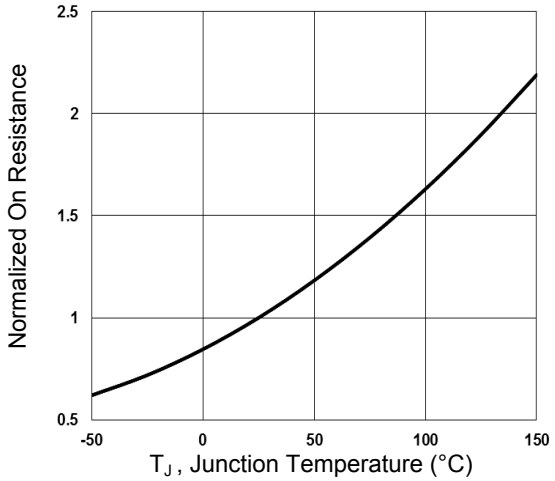


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

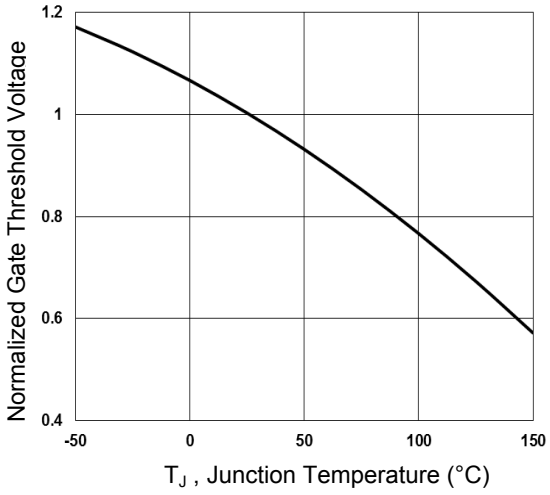


Fig.3 Normalized V_{th} vs. T_J

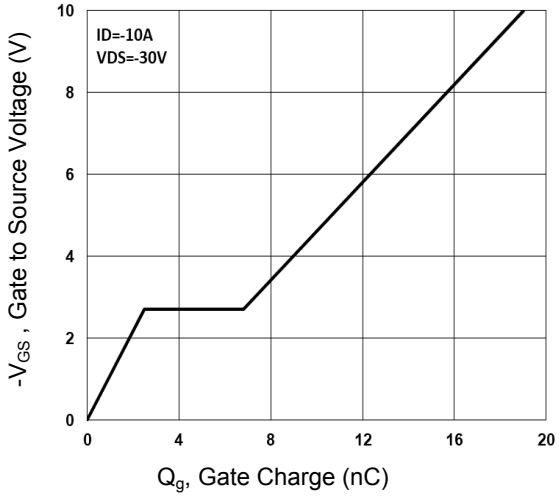


Fig.4 Gate Charge Waveform

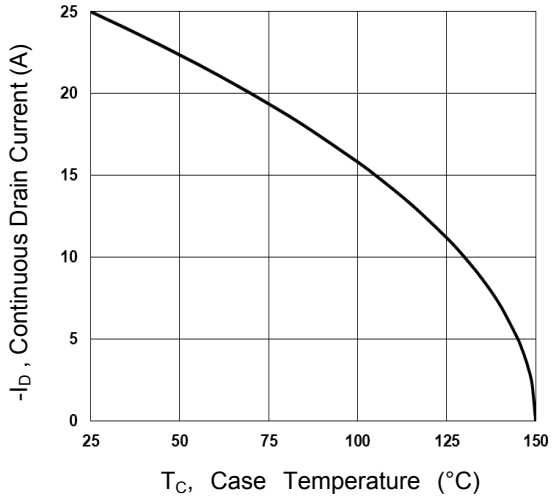


Fig.5 Continuous Drain Current vs. T_C

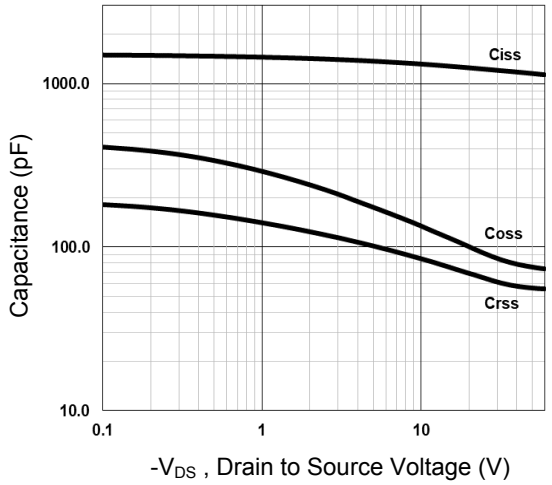


Fig.6 Capacitance Characteristics

Typical Electrical and Thermal Characteristic Curves

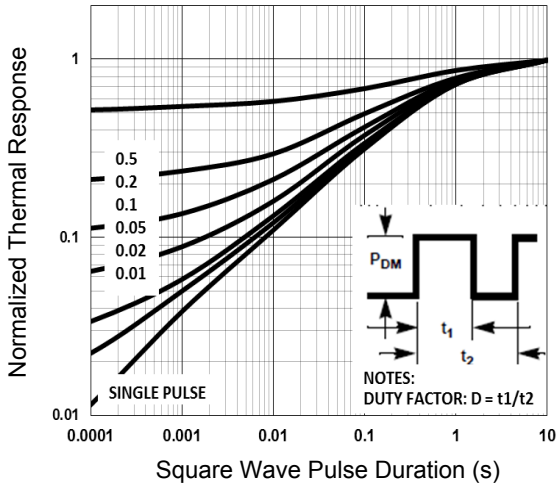


Fig.7 Normalized Transient Impedance

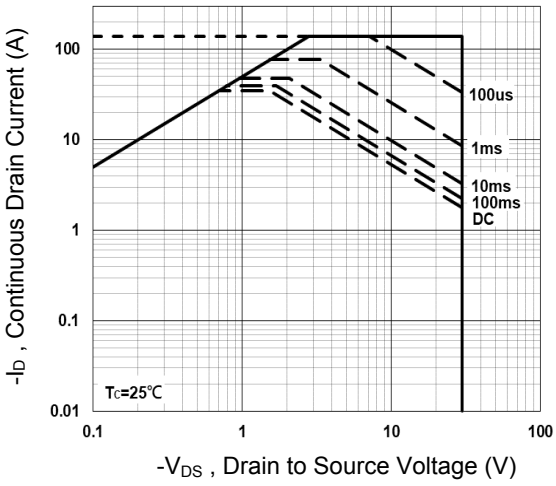


Fig.8 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

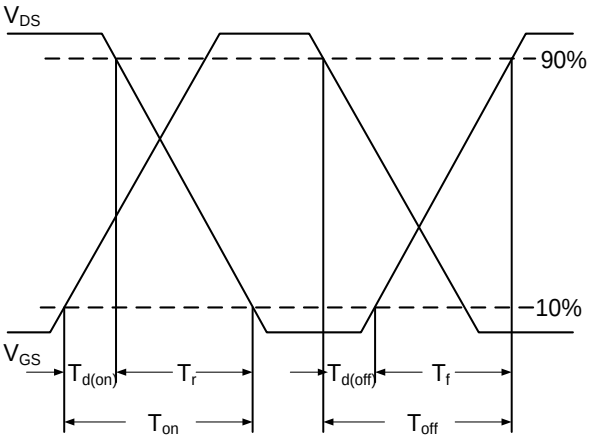


Fig.9 Switching Time Waveform

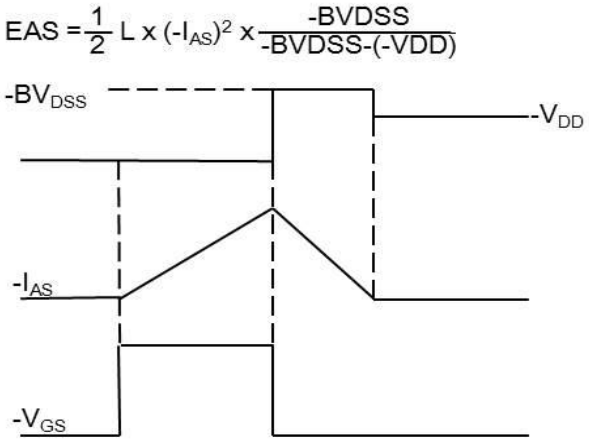
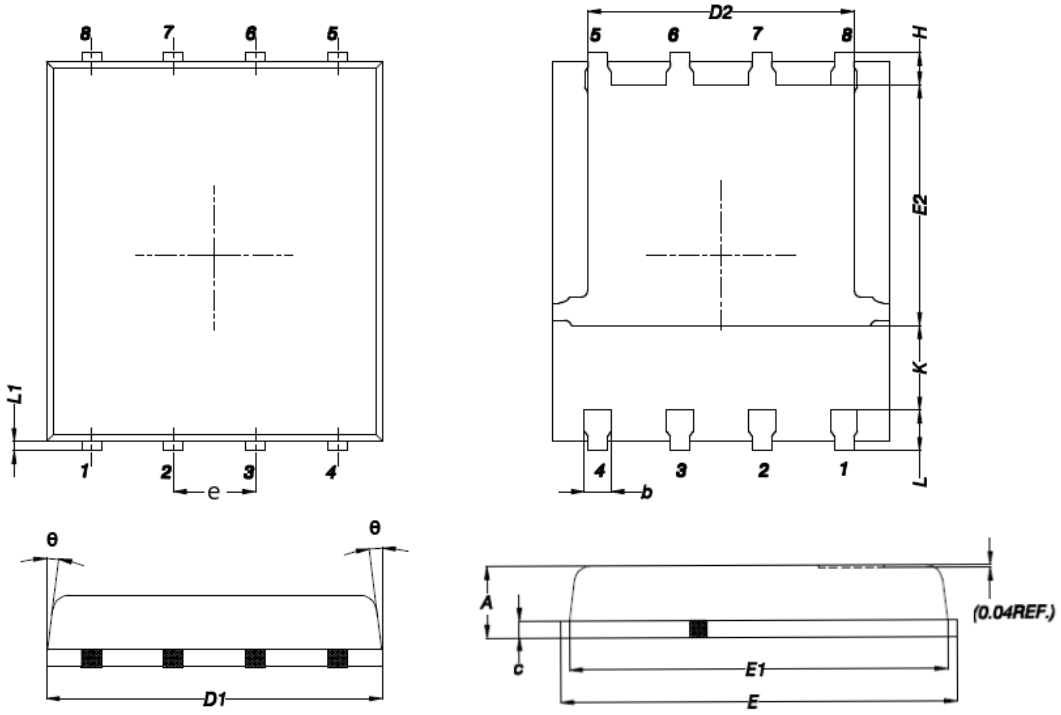


Fig.10 EAS Waveform

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	0.330	0.020	0.013
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°