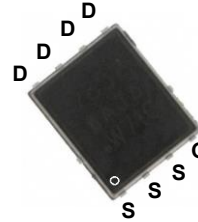
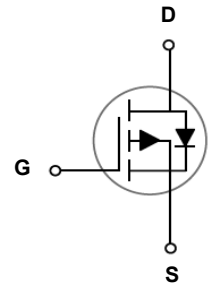


Main Product Characteristics

BV_{DSS}	-30V
$R_{DS(ON)}$	3.3m Ω
I_D	-100A



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 GSFP03101 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 ($T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous ($T_C=25^\circ\text{C}$)	I_D	-100	A
Drain Current-Continuous ($T_C=100^\circ\text{C}$)		-63.2	A
Drain Current-Pulsed ¹	I_{DM}	-400	A
Single Pulse Avalanche Energy ²	E_{AS}	320	mJ
Single Pulse Avalanche Current ²	I_{AS}	80	A
Power Dissipation ($T_C=25^\circ\text{C}$)	P_D	138	W
Power Dissipation-De-rate Above 25°C		1.11	W/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.9	$^\circ\text{C}/\text{W}$
Storage Temperature Range	T_{STG}	-55 To +150	$^\circ\text{C}$
Operating Junction Temperature Range	T_J	-55 To +150	$^\circ\text{C}$


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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-30	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-30V, V_{GS}=0V, T_J=25^\circ\text{C}$	-	-	-1	μA
		$V_{DS}=-24V, V_{GS}=0V, T_J=125^\circ\text{C}$	-	-	-10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On Characteristics						
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-30A$	-	2.6	3.3	m Ω
		$V_{GS}=-4.5V, I_D=-20A$	-	3.8	5	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.2	-1.6	-2.2	V
Forward Transconductance	g_{FS}	$V_{DS}=-10V, I_D=-3A$	-	20	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{3,4}	Q_g	$V_{DS}=-24V, I_D=-10A, V_{GS}=-10V$	-	146	210	nC
Gate-Source Charge ^{3,4}	Q_{gs}		-	22	44	
Gate-Drain Charge ^{3,4}	Q_{gd}		-	32	64	
Turn-On Delay Time ^{3,4}	$t_{d(on)}$	$V_{DD}=-15V, R_G=5\Omega, V_{GS}=-10V, I_D=-10A$	-	17	34	nS
Rise Time ^{3,4}	t_r		-	61	120	
Turn-Off Delay Time ^{3,4}	$t_{d(off)}$		-	200	400	
Fall Time ^{3,4}	t_f		-	113	220	
Input Capacitance	C_{iss}	$V_{DS}=-25V, V_{GS}=0V, F=1\text{MHz}$	-	7930	12000	pF
Output Capacitance	C_{oss}		-	983	1300	
Reverse Transfer Capacitance	C_{rss}		-	505	750	
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	$V_G=V_D=0V, \text{Force Current}$	-	-	-100	A
Pulsed Source Current	I_{SM}		-	-	-200	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=-1A, T_J=25^\circ\text{C}$	-	-	-1	V
Reverse Recovery Time	T_{rr}	$V_{GS}=0V, I_S=-20A, di/dt=100A/\mu s, T_J=25^\circ\text{C}$	-	52	-	nS
Reverse Recovery Charge	Q_{rr}		-	53	-	nC

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. $V_{DD}=25V, V_{GS}=10V, L=0.1\text{mH}, I_{AS}=80A, R_G=25\Omega$ Starting $T_J=25^\circ\text{C}$
3. Pulse test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

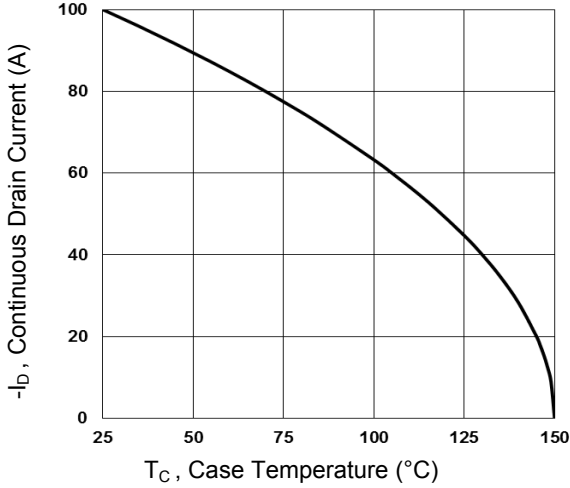


Figure 1. Continuous Drain Current vs. T_c

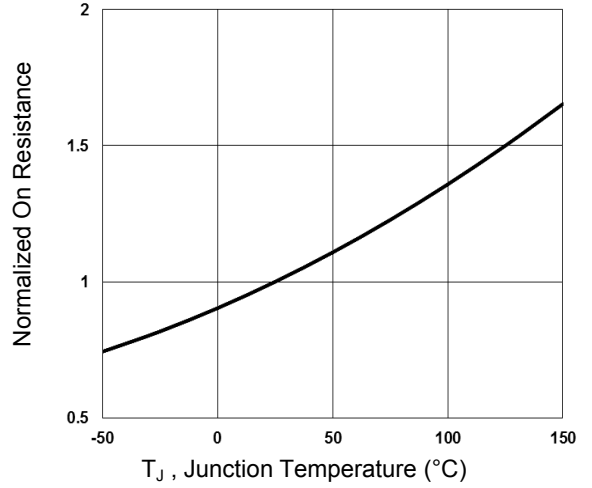


Figure 2. Normalized $R_{DS(ON)}$ vs. T_j

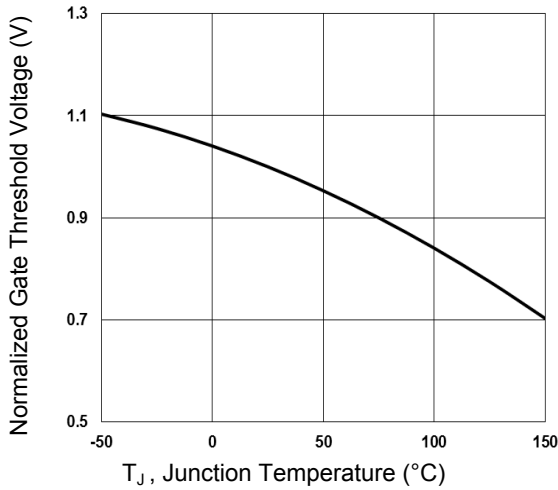


Figure 3. Normalized V_{th} vs. T_j

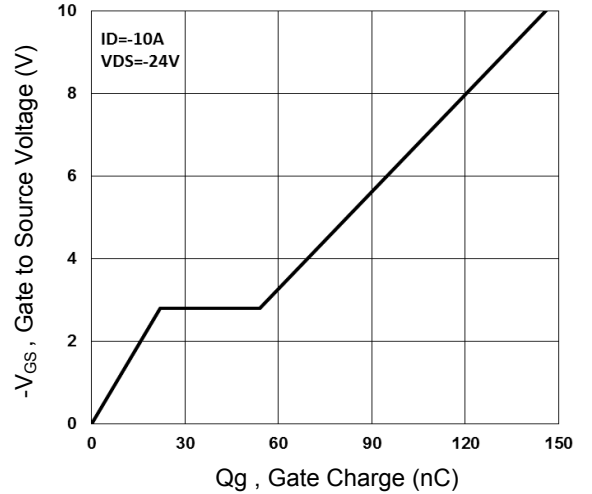


Figure 4. Gate Charge Waveform

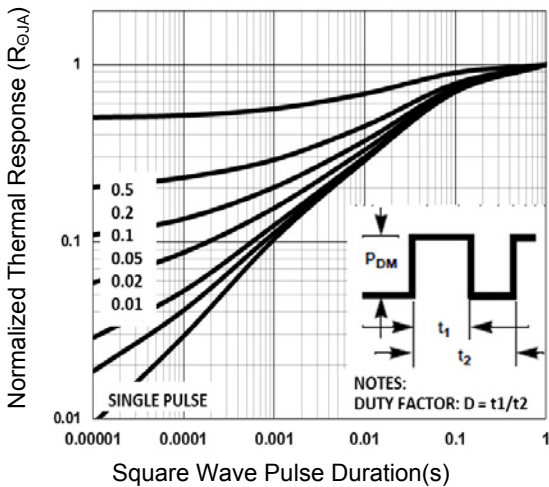


Figure 5. Normalized Transient Response

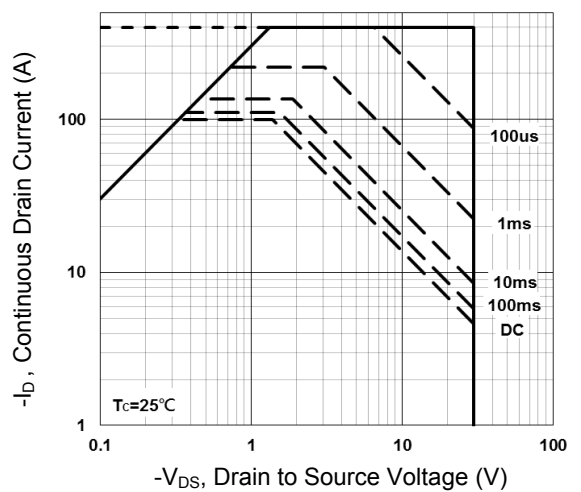


Figure 6. Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

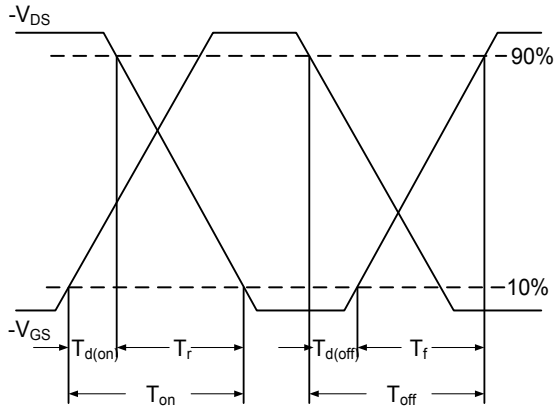


Figure 7. Switching Time Waveform

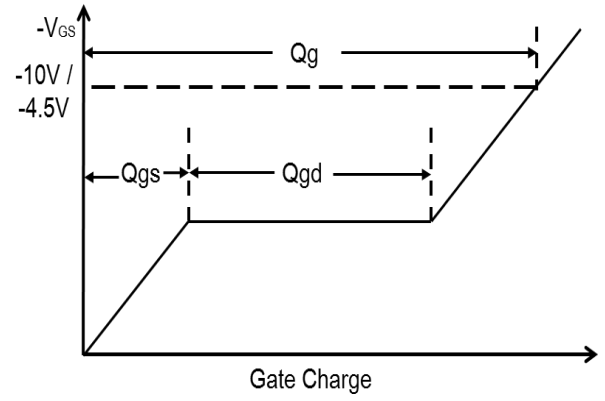
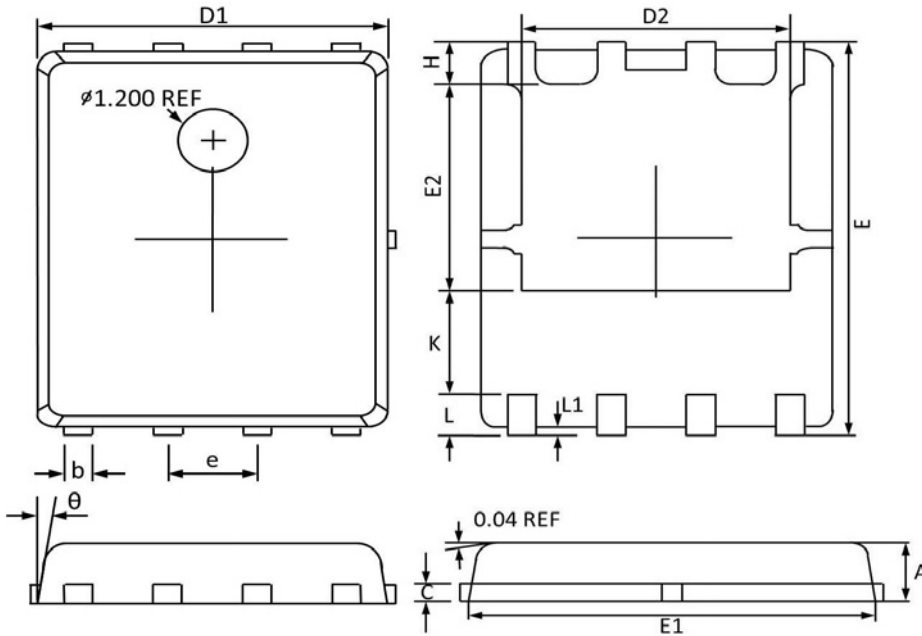


Figure 8. Gate Charge Waveform

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°