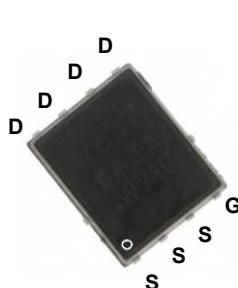
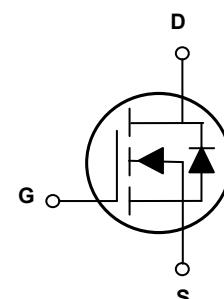


Main Product Characteristics

BV _{DSS}	30V
R _{DS(ON)}	2mΩ
I _D	165A


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 GSFP03116 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}	30	V
Gate-Source Voltage	V _{GS}	±20	V
Drain Current-Continuous (T _C =25°C)	I _D	165	A
Drain Current-Continuous (T _C =100°C)		105	
Drain Current-Pulsed ¹	I _{DM}	660	A
Single Pulse Avalanche Energy ²	E _{AS}	180	mJ
Single Pulse Avalanche Current ²	I _{AS}	60	A
Power Dissipation (T _C =25°C)	P _D	135	W
Power Dissipation-Derate above 25°C		1.08	W/°C
Thermal Resistance, Junction-to-Ambient	R _{θJA}	62	°C/W
Thermal Resistance, Junction-to-Case	R _{θJC}	0.92	°C/W
Operating Junction Temperature Range	T _J	-55 To +150	°C
Storage Temperature Range	T _{STG}	-55 To +150	°C

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On/Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{\text{GS}}=0\text{V}, I_{\text{D}}=250\mu\text{A}$	30	-	-	V
BV_{DSS} Temperature Coefficient	$\Delta \text{BV}_{\text{DSS}}/\Delta T_J$	Reference to 25°C , $I_{\text{D}}=1\text{mA}$	-	0.03	-	$\text{V}/^\circ\text{C}$
Drain-Source Leakage Current	I_{DSS}	$V_{\text{DS}}=30\text{V}, V_{\text{GS}}=0\text{V}, T_J=25^\circ\text{C}$	-	-	1	μA
		$V_{\text{DS}}=24\text{V}, V_{\text{GS}}=0\text{V}, T_J=125^\circ\text{C}$	-	-	10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{\text{GS}}=\pm 20\text{V}, V_{\text{DS}}=0\text{V}$	-	-	± 100	nA
Static Drain-Source On-Resistance ³	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}}=10\text{V}, I_{\text{D}}=30\text{A}$	-	1.6	2	$\text{m}\Omega$
		$V_{\text{GS}}=4.5\text{V}, I_{\text{D}}=15\text{A}$	-	2.1	2.7	
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{GS}}=V_{\text{DS}}, I_{\text{D}}=250\mu\text{A}$	1.2	1.6	2.5	V
$V_{\text{GS}(\text{th})}$ Temperature Coefficient	$\Delta V_{\text{GS}(\text{th})}$		-	-5	-	$\text{mV}/^\circ\text{C}$
Forward Transconductance	g_{fs}	$V_{\text{DS}}=10\text{V}, I_{\text{D}}=2\text{A}$	-	16.5	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{3,4}	Q_g	$V_{\text{DS}}=15\text{V}, I_{\text{D}}=24\text{A}, V_{\text{GS}}=4.5\text{V}$	-	40	75	nC
		$V_{\text{DS}}=15\text{V}, I_{\text{D}}=24\text{A}, V_{\text{GS}}=10\text{V}$	-	82	160	
Gate-Source Charge ^{3,4}	Q_{gs}		-	12	24	
Gate-Drain Charge ^{3,4}	Q_{gd}		-	17	35	
Turn-On Delay Time ^{3,4}	$t_{\text{d}(\text{on})}$	$V_{\text{DD}}=15\text{V}, R_{\text{G}}=1\Omega, V_{\text{GS}}=10\text{V}, I_{\text{D}}=1\text{A}$	-	20	40	nS
Rise Time ^{3,4}	t_r		-	32	60	
Turn-Off Delay Time ^{3,4}	$t_{\text{d}(\text{off})}$		-	75	130	
Fall Time ^{3,4}	t_f		-	28	55	
Input Capacitance	C_{iss}	$V_{\text{DS}}=15\text{V}, V_{\text{GS}}=0\text{V}, F=1\text{MHz}$	-	4800	8600	pF
Output Capacitance	C_{oss}		-	700	1400	
Reverse Transfer Capacitance	C_{rss}		-	320	640	
Gate Resistance	R_g	$V_{\text{GS}}=0\text{V}, V_{\text{DS}}=0\text{V}, F=1\text{MHz}$	-	1.6	3.5	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_s	$V_G=V_D=0\text{V}, \text{Force Current}$	-	-	165	A
Pulsed Source Current ³	I_{SM}		-	-	330	A
Diode Forward Voltage ³	V_{SD}	$V_{\text{GS}}=0\text{V}, I_{\text{s}}=1\text{A}, T_J=25^\circ\text{C}$	-	-	1	V
Reverse Recovery Time	t_{rr}	$V_R=30\text{V}, I_{\text{s}}=10\text{A}, dI/dt=100\text{A}/\mu\text{s}, T_J=25^\circ\text{C}$	-	140	-	nS
Reverse Recovery Charge	Q_{rr}		-	300	-	nC

Note:

- Repetitive rating: Pulsed width limited by maximum junction temperature.
- $V_{\text{DD}}=25\text{V}, V_{\text{GS}}=10\text{V}, L=0.1\text{mH}, I_{\text{AS}}=60\text{A}, R_{\text{G}}=25\Omega$, starting $T_J=25^\circ\text{C}$.
- Pulse test: pulse width $\leq 300\text{us}$, duty cycle $\leq 2\%$.
- Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

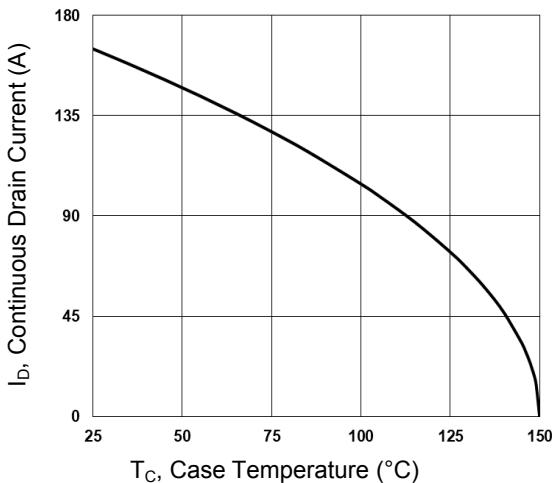


Figure 1. Continuous Drain Current vs. T_C

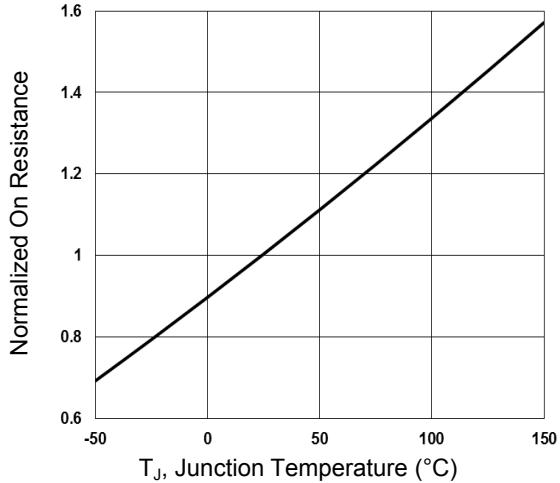


Figure 2. Normalized R_{D_S(ON)} vs. T_J

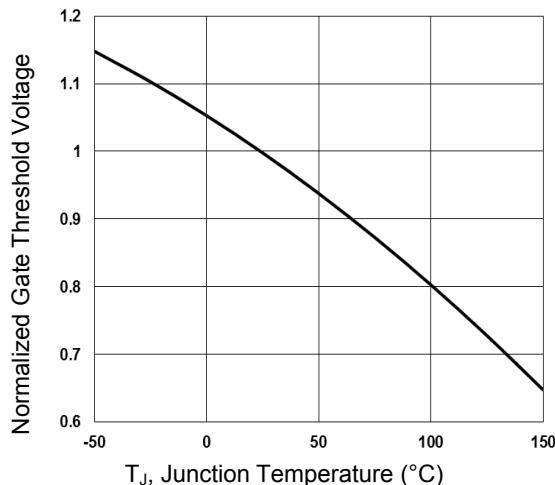


Figure 3. Normalized V_{th} vs. T_J

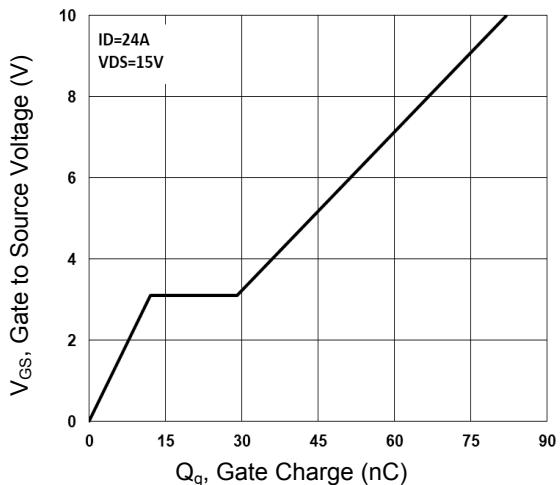


Figure 4. Gate Charge Waveform

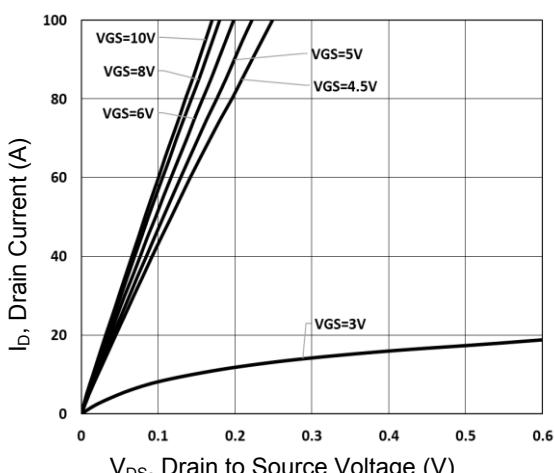


Figure 5. Typical Output Characteristics

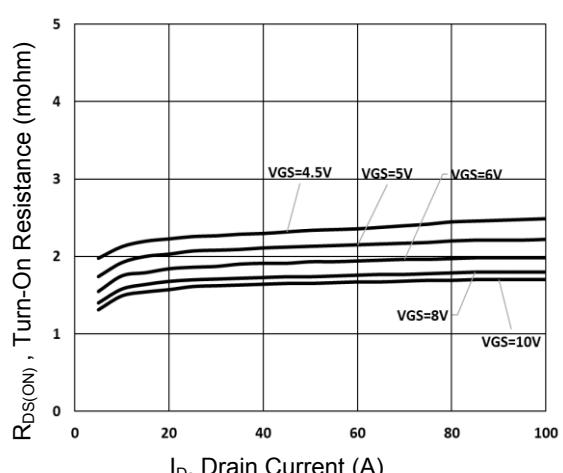


Figure 6. Turn-On Resistance vs. ID

Typical Electrical and Thermal Characteristic Curves

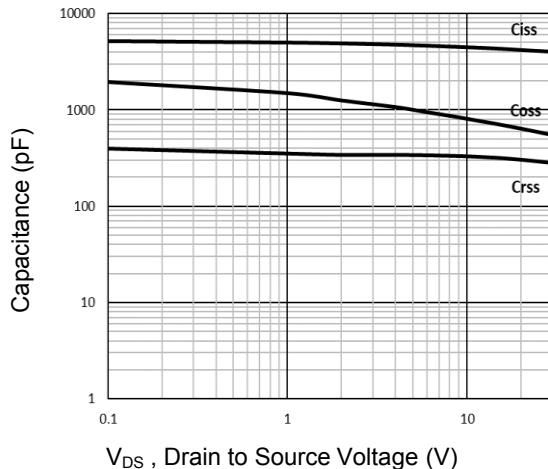


Figure 7. Capacitance Characteristics

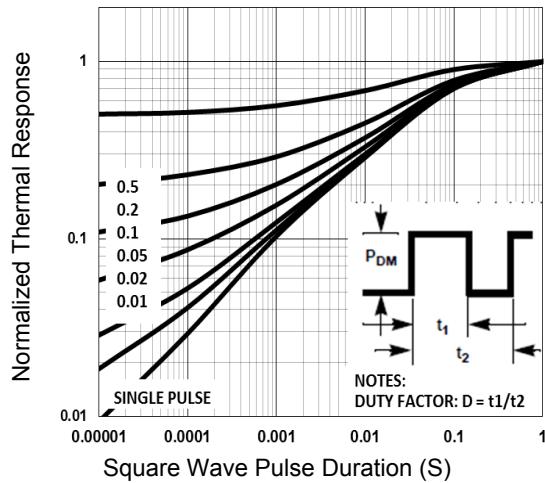


Figure 8. Normalized Transient Impedance

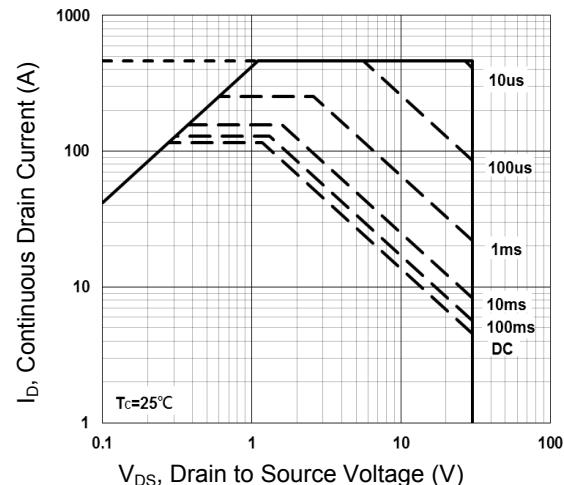


Figure 9. Maximum Safe Operation Area

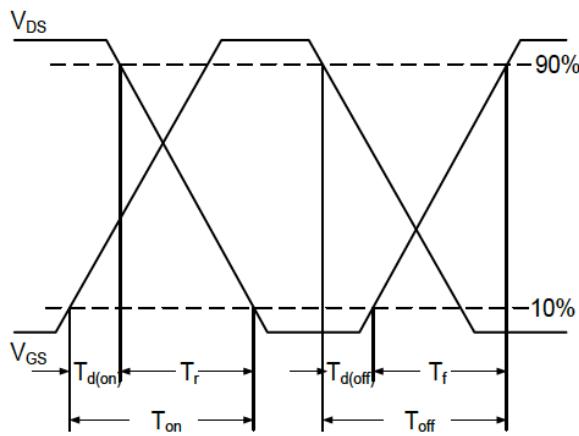


Figure 10. Switching Time Waveform

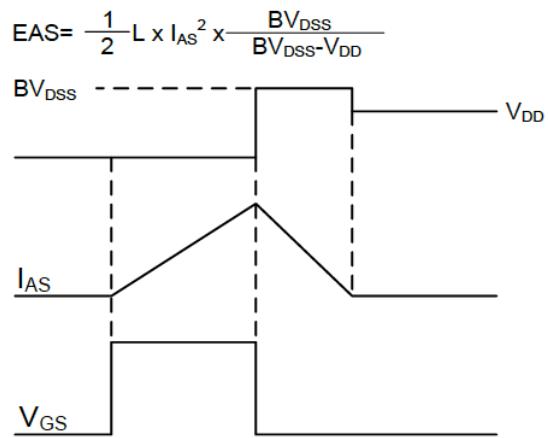
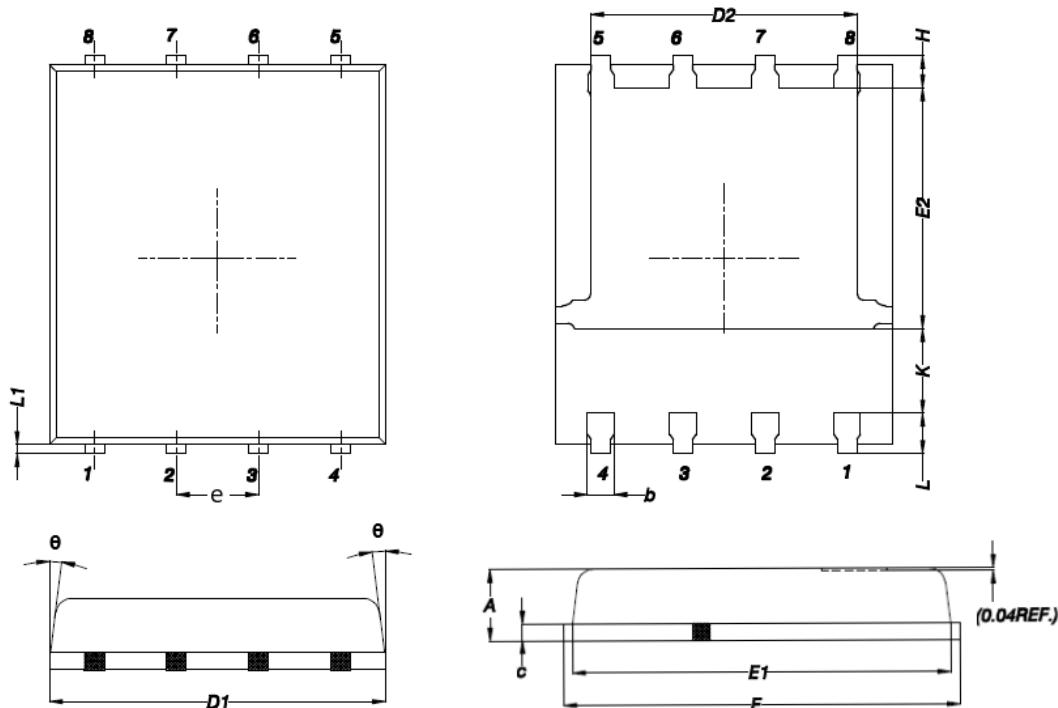


Figure 11. EAS Waveform

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°