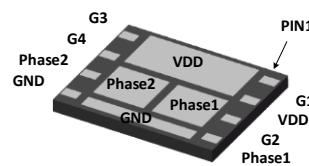
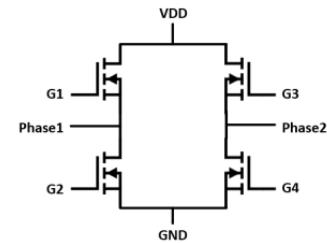


Main Product Characteristics

BV _{DSS}	30V
R _{DS(ON)}	8.0mΩ
I _D	45A



DFN5x6



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 GSMP0346 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	Max.	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	45	A
Drain Current-Continuous ($T_C=100^\circ\text{C}$)		28.5	
Drain Current-Pulsed ¹	I _{DM}	180	A
Single Pulse Avalanche Energy ²	E _{AS}	45	mJ
Single Pulse Avalanche Current ²	I _{AS}	30	A
Power Dissipation ($T_C=25^\circ\text{C}$)	P _D	27.2	W
Power Dissipation-Derate above 25°C		0.22	W/°C
Thermal Resistance, Junction-to-Ambient	R _{θJA}	62	°C/W
Thermal Resistance, Junction-to-Case	R _{θJC}	4.6	°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}	$\text{V}_{\text{GS}}=0\text{V}, \text{I}_D=250\mu\text{A}$	30	-	-	V
BV_{DSS} Temperature Coefficient	$\Delta \text{BV}_{\text{DSS}}/\Delta T_J$	Reference to 25°C , $\text{I}_D=1\text{mA}$	-	0.04	-	$\text{V}/^\circ\text{C}$
Drain-Source Leakage Current	I_{DS}	$\text{V}_{\text{DS}}=30\text{V}, \text{V}_{\text{GS}}=0\text{V}, T_J=25^\circ\text{C}$	-	-	1	μA
		$\text{V}_{\text{DS}}=24\text{V}, \text{V}_{\text{GS}}=0\text{V}, T_J=125^\circ\text{C}$	-	-	10	
Gate-Source Leakage Current	I_{GSS}	$\text{V}_{\text{GS}}=\pm 20\text{V}, \text{V}_{\text{DS}}=0\text{V}$	-	-	± 100	nA
Static Drain-Source On-Resistance ³	$\text{R}_{\text{DS}(\text{ON})}$	$\text{V}_{\text{GS}}=10\text{V}, \text{I}_D=16\text{A}$	-	6.5	8.0	$\text{m}\Omega$
		$\text{V}_{\text{GS}}=4.5\text{V}, \text{I}_D=8\text{A}$	-	9.5	12	
Gate Threshold Voltage	$\text{V}_{\text{GS}(\text{th})}$	$\text{V}_{\text{GS}}=\text{V}_{\text{DS}}, \text{I}_D=250\mu\text{A}$	1.2	1.6	2.5	V
$\text{V}_{\text{GS}(\text{th})}$ Temperature Coefficient	$\Delta \text{V}_{\text{GS}(\text{th})}$		-	-4	-	$\text{mV}/^\circ\text{C}$
Forward Transconductance	g_{fs}	$\text{V}_{\text{DS}}=10\text{V}, \text{I}_D=8\text{A}$	-	9.5	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{3,4}	Q_g	$\text{V}_{\text{DS}}=15\text{V}, \text{I}_D=20\text{A}, \text{V}_{\text{GS}}=10\text{V}$	-	16.7	33	nC
Gate-Source Charge ^{3,4}	Q_{gs}		-	4.5	8.0	
Gate-Drain Charge ^{3,4}	Q_{gd}		-	1.3	2.6	
Turn-On Delay Time ^{3,4}	$t_{\text{d}(\text{on})}$	$\text{V}_{\text{DD}}=15\text{V}, \text{R}_g=3.3\Omega, \text{V}_{\text{GS}}=10\text{V}, \text{I}_D=15\text{A}$	-	4.8	9.0	nS
Rise Time ^{3,4}	t_r		-	12.5	24	
Turn-Off Delay Time ^{3,4}	$t_{\text{d}(\text{off})}$		-	27.6	52	
Fall Time ^{3,4}	t_f		-	8.2	16	
Input Capacitance	C_{iss}	$\text{V}_{\text{DS}}=25\text{V}, \text{V}_{\text{GS}}=0\text{V}, \text{F}=1\text{MHz}$	-	850	1700	pF
Output Capacitance	C_{oss}		-	133	260	
Reverse Transfer Capacitance	C_{rss}		-	78	160	
Gate Resistance	R_g	$\text{V}_{\text{GS}}=0\text{V}, \text{V}_{\text{DS}}=0\text{V}, \text{F}=1\text{MHz}$	-	2.7	5.4	Ω
Guaranteed Avalanche Energy						
Single Pulse Avalanche Energy	E_{AS}	$\text{V}_{\text{DD}}=25\text{V}, \text{L}=0.1\text{mH}, \text{I}_{\text{AS}}=15\text{A}$	12	-	-	mJ
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_s	$\text{V}_G=\text{V}_D=0\text{V}$, Force Current	-	-	45	A
Pulsed Source Current ³	I_{SM}		-	-	90	A
Diode Forward Voltage ³	V_{SD}	$\text{V}_{\text{GS}}=0\text{V}, \text{I}_s=1\text{A}, T_J=25^\circ\text{C}$	-	-	1	V
Reverse Recovery Time	t_{rr}	$\text{V}_{\text{GS}}=0\text{V}, \text{I}_s=10\text{A}, \text{di/dt}=100\text{A}/\mu\text{s}, T_J=25^\circ\text{C}$	-	8.1	-	nS
Reverse Recovery Charge	Q_{rr}		-	1.6	-	nC

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. $\text{V}_{\text{DD}}=25\text{V}, \text{V}_{\text{GS}}=10\text{V}, \text{L}=0.1\text{mH}, \text{I}_{\text{AS}}=30\text{A}, \text{R}_g=25\Omega$, starting $T_J=25^\circ\text{C}$.
3. The datasheet test by pulsed, pulse width $\leqslant 300\text{us}$, duty cycle $\leqslant 2\%$.
4. Essentially independent of operation temperature.

Typical Electrical and Thermal Characteristic Curves

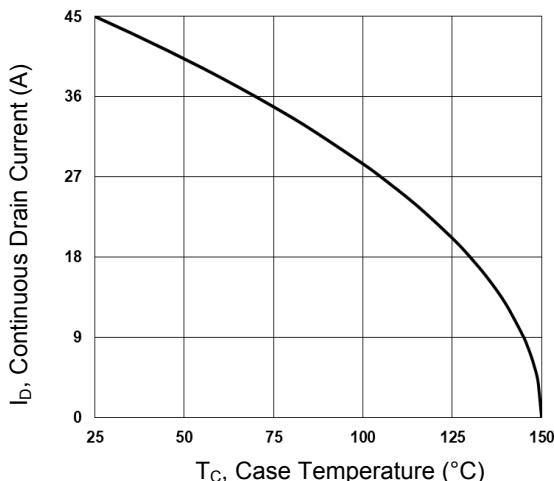


Figure 1. Continuous Drain Current vs. T_c

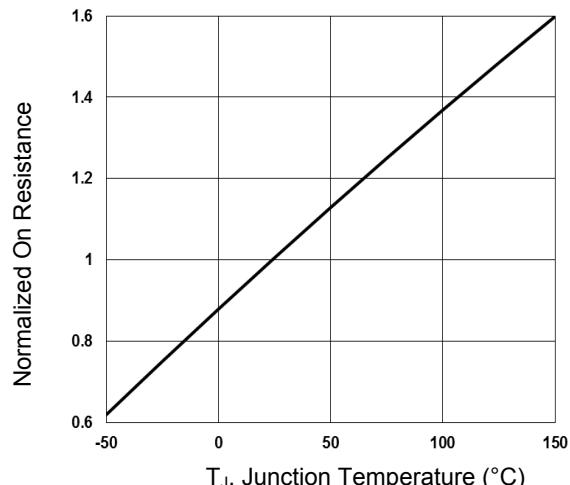


Figure 2. Normalized $R_{DS(ON)}$ vs. T_j

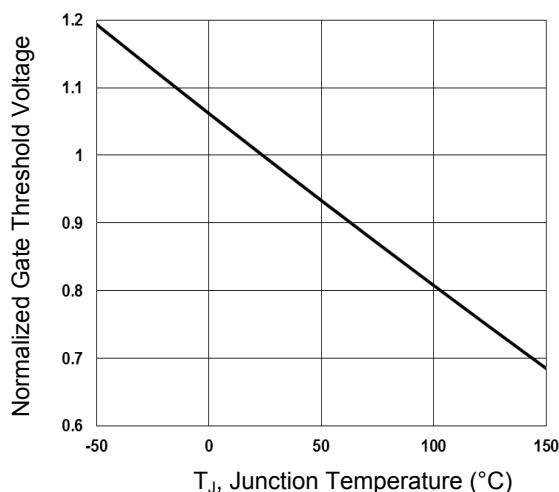


Figure 3. Normalized V_{th} vs. T_j

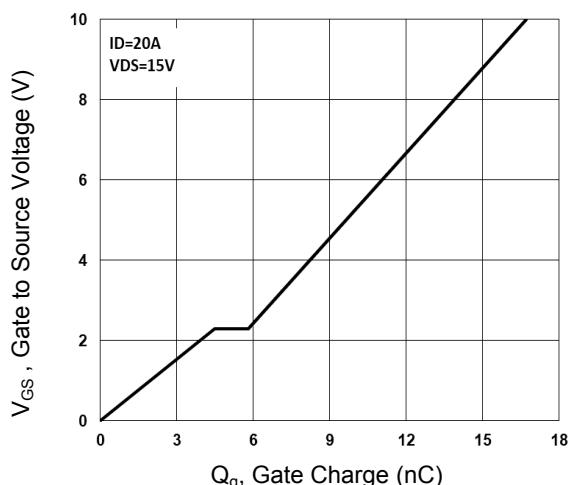


Figure 4. Gate Charge Characteristics

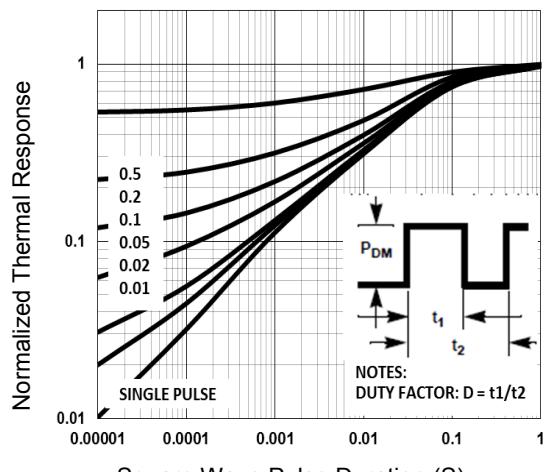


Figure 5. Normalized Transient Impedance

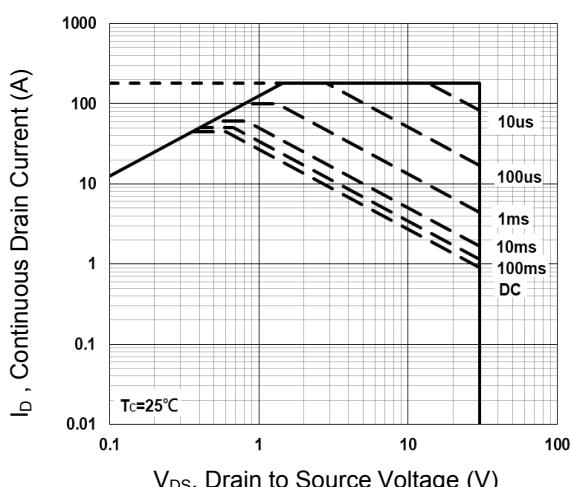


Figure 6. Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

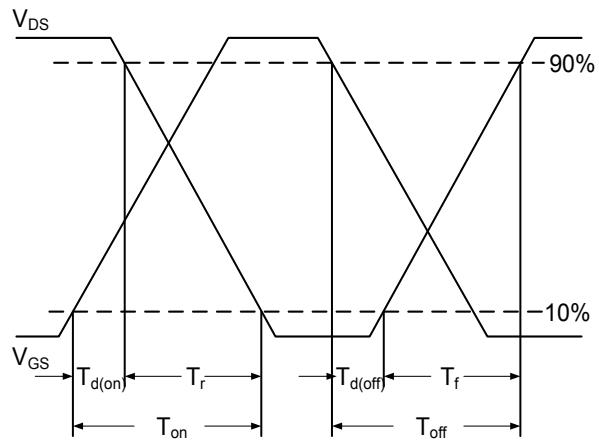


Figure 7. Switching Time Waveform

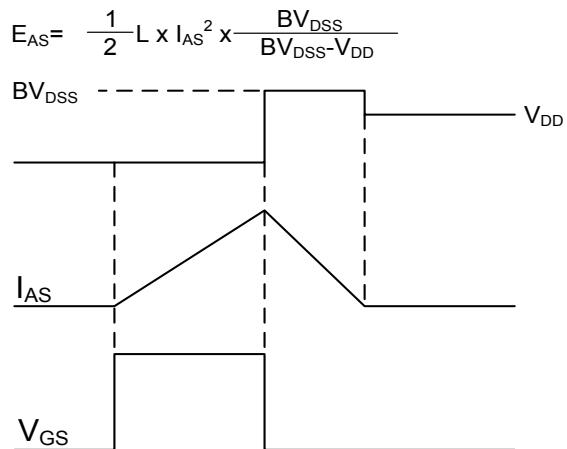
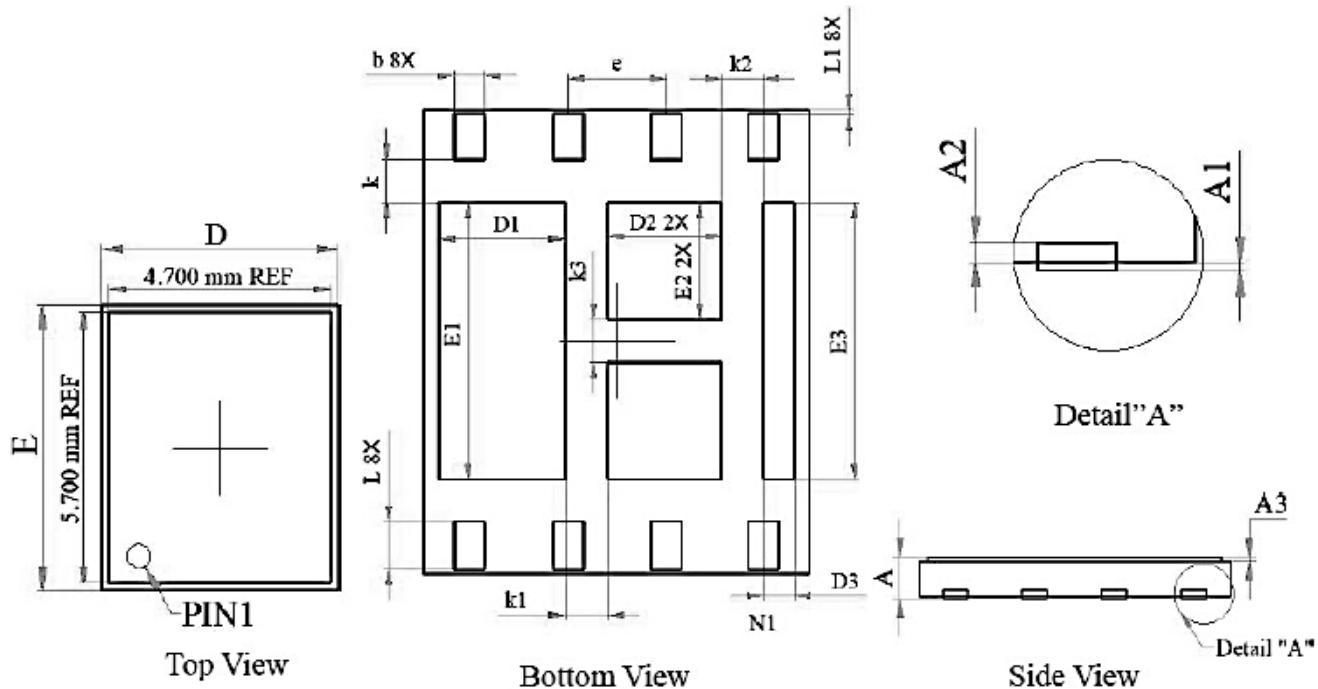


Figure 8. EAS Waveform

Package Outline Dimensions

DFN5x6



Symbol	Dimensions In Millimeters			Symbol	Dimensions In Millimeters		
	MIN	Normal	MAX		MIN	Normal	MAX
A	0.530	-	0.600	D3	0.300	0.400	0.500
A1	-	-	0.005	E3	3.500	3.600	3.700
A2	0.030	-	0.100	b	0.350	0.400	0.450
A3	0.050	-	0.100	L	0.550	0.600	0.650
D	4.900	5.000	5.100	L1	0.010	0.050	0.090
E	5.900	6.000	6.100	k	0.550 REF		
D1	1.525	1.625	1.725	k1	0.550 REF		
E1	3.500	3.600	3.700	k2	0.550 REF		
D2	1.375	1.475	1.575	k3	0.550 REF		
E2	1.425	1.525	1.625	e	1.27 BSC		

Recommended Pad Layout

