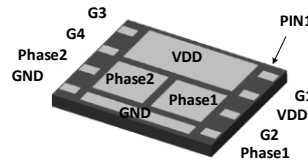
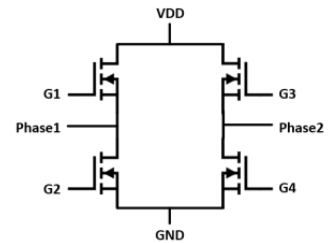


Main Product Characteristics

BV_{DSS}	30V
$R_{DS(ON)}$	8.0m Ω
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	
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	4.6	$^\circ\text{C}/\text{W}$
Operating Junction Temperature Range	T_J	-55 To +150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 To +150	$^\circ\text{C}$

Electrical Characteristics (T_J=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On/Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	30	-	-	V
BV _{DSS} Temperature Coefficient	ΔBV _{DSS} /ΔT _J	Reference to 25°C, I _D =1mA	-	0.04	-	V/°C
Drain-Source Leakage Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V, T _J =25°C	-	-	1	μA
		V _{DS} =24V, V _{GS} =0V, T _J =125°C	-	-	10	
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
Static Drain-Source On-Resistance ³	R _{DS(ON)}	V _{GS} =10V, I _D =16A	-	6.5	8.0	mΩ
		V _{GS} =4.5V, I _D =8A	-	9.5	12	
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =250μA	1.2	1.6	2.5	V
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)}		-	-4	-	mV/°C
Forward Transconductance	g _{fs}	V _{DS} =10V, I _D =8A	-	9.5	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{3,4}	Q _g	V _{DS} =15V, I _D =20A, V _{GS} =10V	-	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 _{d(on)}	V _{DD} =15V, R _G =3.3Ω, V _{GS} =10V, I _D =15A	-	4.8	9.0	nS
Rise Time ^{3,4}	t _r		-	12.5	24	
Turn-Off Delay Time ^{3,4}	t _{d(off)}		-	27.6	52	
Fall Time ^{3,4}	t _f		-	8.2	16	
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, F=1MHz	-	850	1700	pF
Output Capacitance	C _{oss}		-	133	260	
Reverse Transfer Capacitance	C _{rss}		-	78	160	
Gate Resistance	R _g	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	2.7	5.4	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I _S	V _G =V _D =0V, Force Current	-	-	45	A
Pulsed Source Current ³	I _{SM}		-	-	90	A
Diode Forward Voltage ³	V _{SD}	V _{GS} =0V, I _S =1A, T _J =25°C	-	-	1	V
Reverse Recovery Time	t _{rr}	V _{GS} =0V, I _S =10A, di/dt=100A/μs, T _J =25°C	-	8.1	-	nS
Reverse Recovery Charge	Q _{rr}		-	1.6	-	nC

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=30A, R_G=25Ω, starting T_J=25°C.
3. The datasheet test by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
4. Essentially independent of operation temperature.

Typical Electrical and Thermal Characteristic Curves

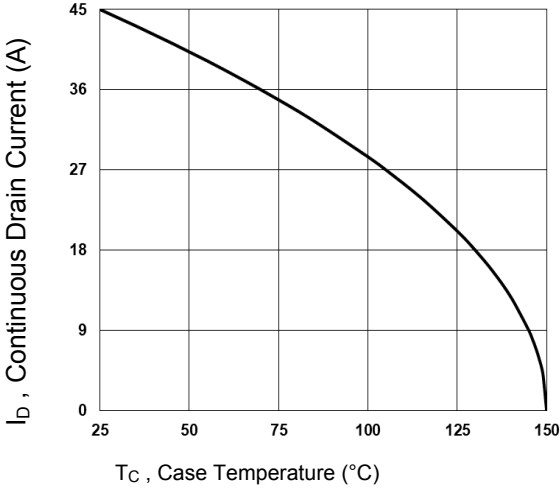


Fig.1 Continuous Drain Current vs. Tc

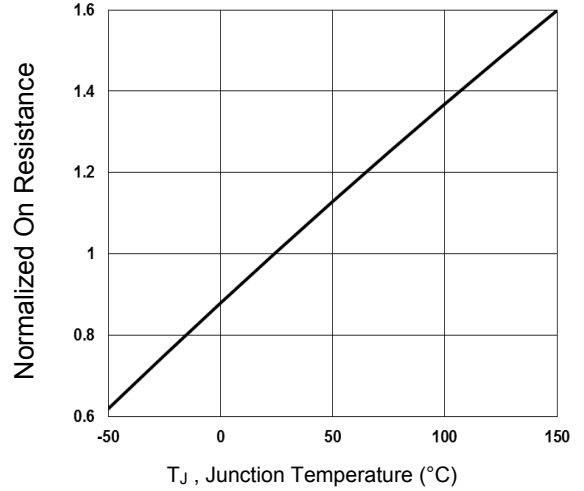


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

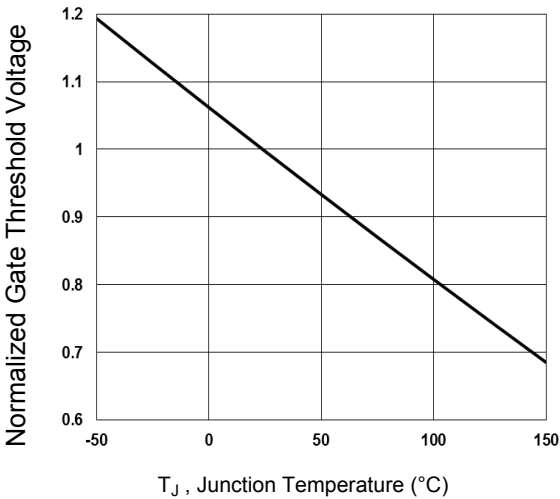


Fig.3 Normalized V_{th} vs. T_J

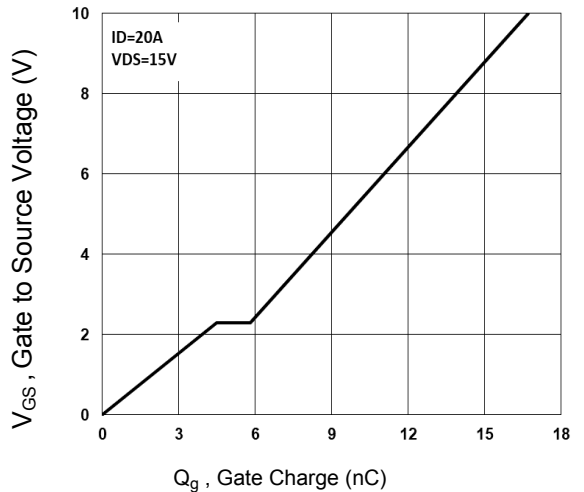


Fig.4 Gate Charge Waveform

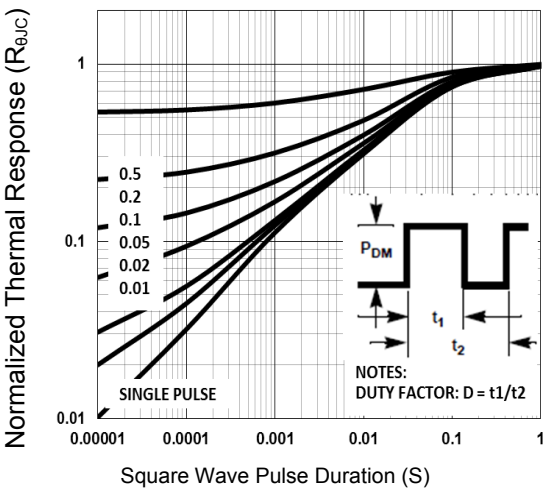


Fig.5 Normalized Transient Impedance

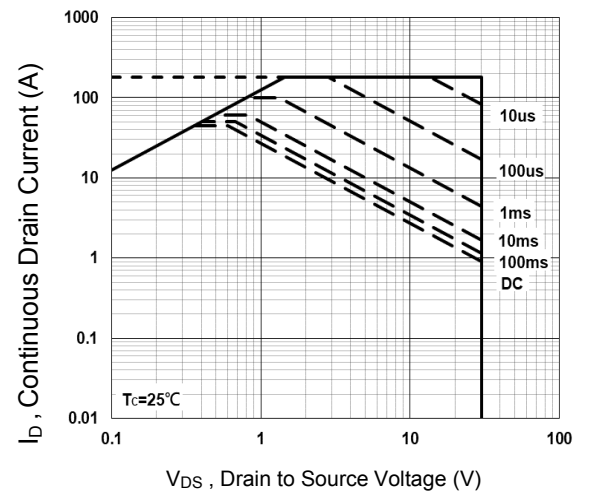


Fig.6 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

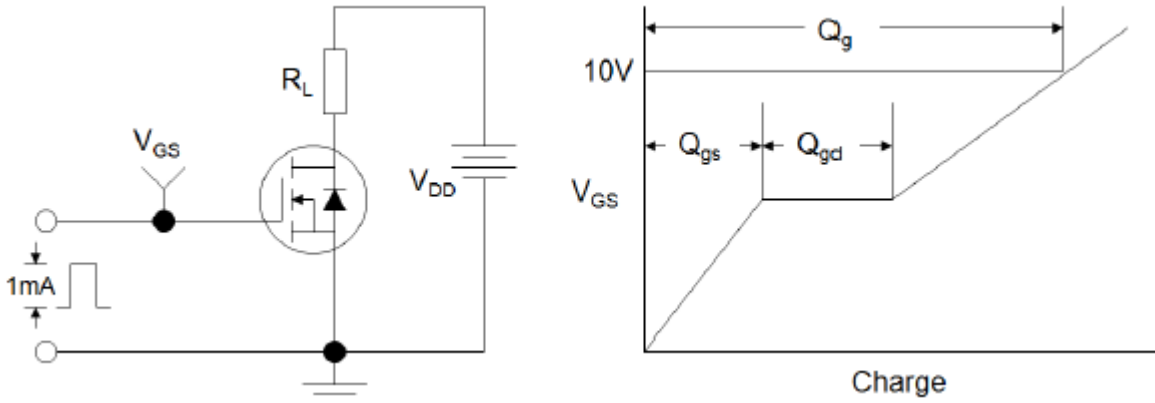


Figure 7. Gate Charge Test Circuit & Waveform

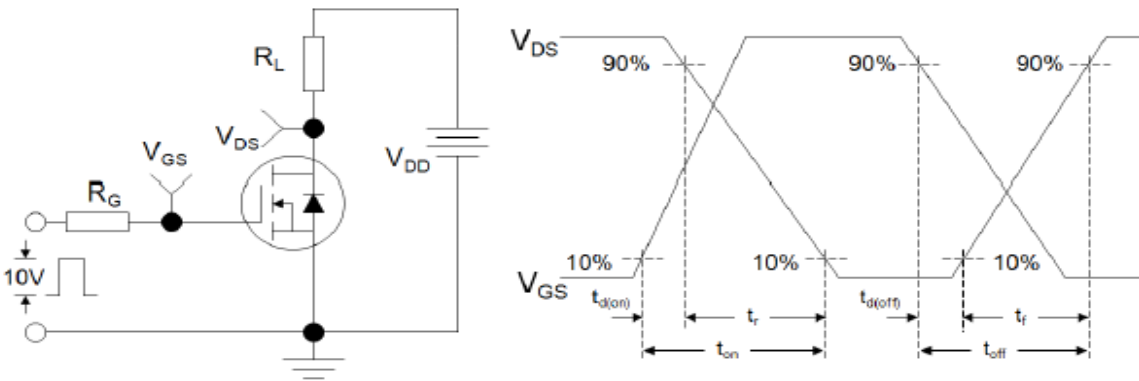


Figure 8. Resistive Switching Test Circuit & Waveforms

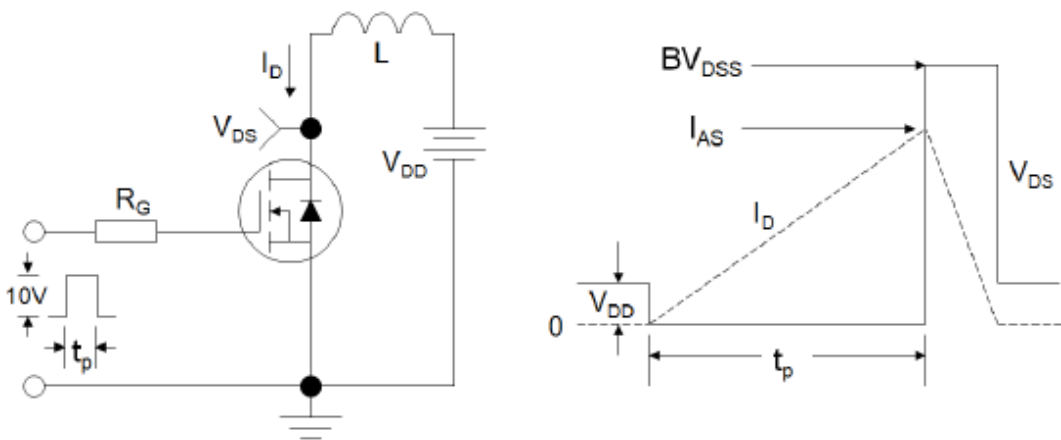
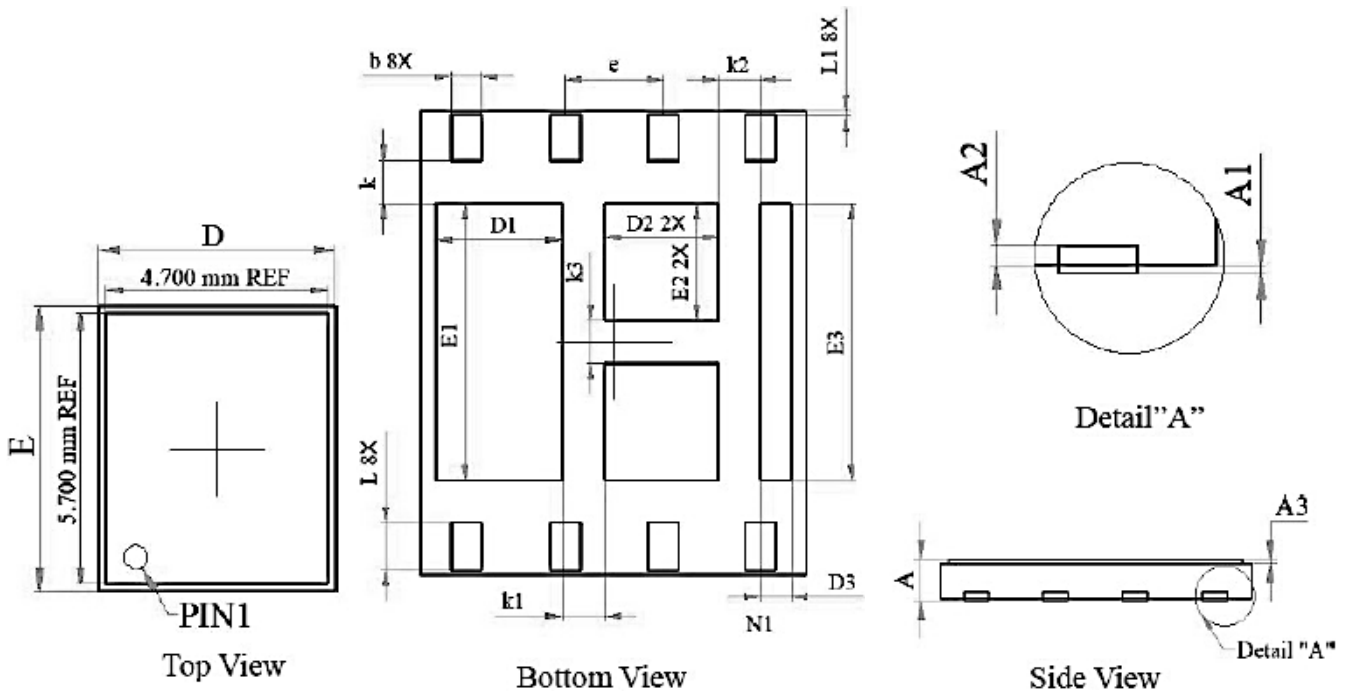


Figure 9. E_{AS} Circuit & Waveforms

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

