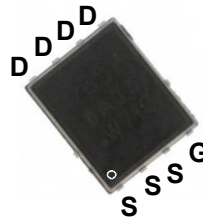
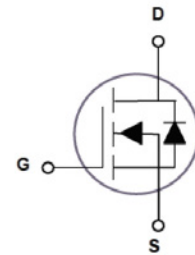


Main Product Characteristics

$V_{(BR)DSS}$	30V
$R_{DS(ON)}$	1.2m Ω
I_D	240A



PPAK 5x6



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 SSFP3990 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	Rating	Unit
Drain-Source Voltage	V _{DS}	30	V
Gate-Source Voltage	V _{GS}	+20/-12	V
Drain Current – Continuous (T _c =25°C)	I _D	240	A
Drain Current – Continuous (T _c =100°C)		150	A
Drain Current – Pulsed ¹	I _{DM}	960	A
Single Pulse Avalanche Energy ²	E _{AS}	423	mJ
Single Pulse Avalanche Current ²	I _{AS}	92	A
Power Dissipation (T _c =25°C)	P _D	178	W
Power Dissipation – Derate above 25°C		1.43	W/°C
Storage Temperature Range	T _{STG}	-55 to +150	°C
Operating Junction Temperature Range	T _J	-55 to +150	°C

Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction to Ambient	R _{θJA}	---	62	°C/W
Thermal Resistance Junction to Case	R _{θJC}	---	0.7	°C/W

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 =250uA	30	---	---	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =24V, V _{GS} =0V, T _J =125°C	---	---	10	uA
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 =30A	---	1	1.2	mΩ
		V _{GS} =4.5V, I _D =15A	---	1.5	2.2	mΩ
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =250uA	1	1.6	2.5	V
Forward Transconductance	g _{fs}	V _{DS} =10V, I _D =3A	---	28	---	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{3,4}	Q _g	V _{DS} =15V, V _{GS} =10V, I _D =30A	---	65	130	nC
Gate-Source Charge ^{3,4}	Q _{gs}		---	18	36	
Gate-Drain Charge ^{3,4}	Q _{gd}		---	8.5	17	
Turn-On Delay Time ^{3,4}	T _{d(on)}	V _{DD} =15V, V _{GS} =10V, R _G =3.3Ω, I _D =1A	---	19	38	nS
Rise Time ^{3,4}	T _r		---	12	24	
Turn-Off Delay Time ^{3,4}	T _{d(off)}		---	62	124	
Fall Time ^{3,4}	T _f		---	130	260	
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, F=1MHz	---	5620	11200	pF
Output Capacitance	C _{oss}		---	2165	4200	
Reverse Transfer Capacitance	C _{rss}		---	46	92	
Gate resistance	R _g	V _{GS} =0V, V _{DS} =0V, F=1MHz	---	1.5	---	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	I _S	V _G =V _D =0V, Force Current	---	---	240	A
Pulsed Source Current	I _{SM}		---	---	480	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	1	V

Notes:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=92A, R_G=25Ω, Starting T_J=25°C.
3. The data tested by pulsed, pulse width ≤ 300uS, duty cycle ≤ 2%.
4. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

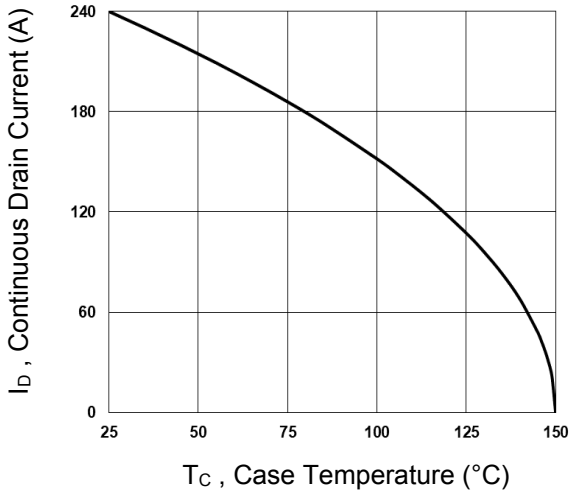


Fig.1 Continuous Drain Current vs. T_c

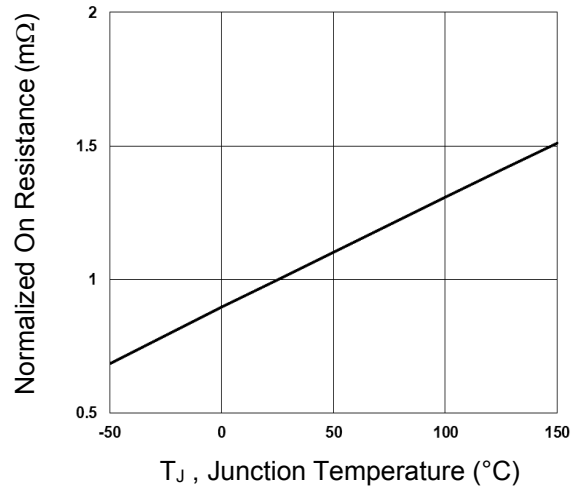


Fig.2 Normalized R_{DS(on)} vs. T_J

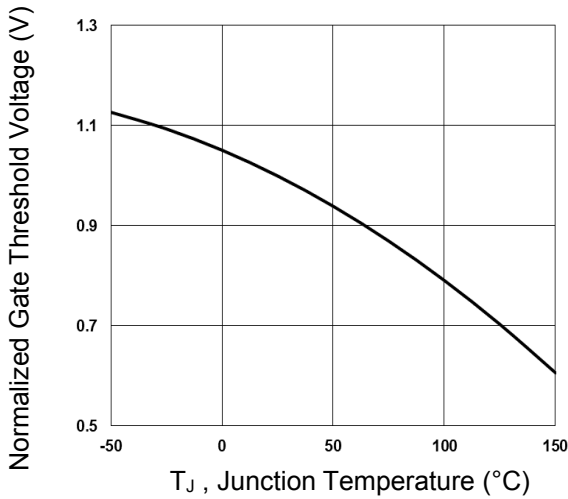


Fig.3 Normalized V_{th} vs. T_J

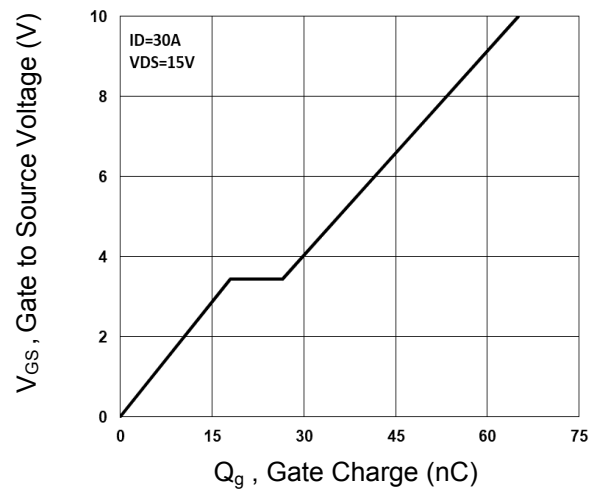


Fig.4 Gate Charge Characteristics

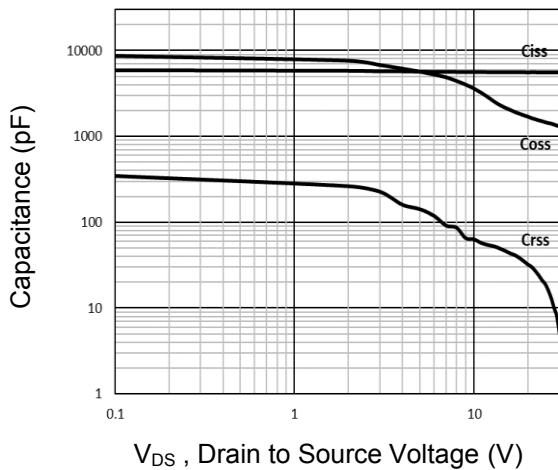


Fig.5 Capacitance Characteristics

Typical Electrical and Thermal Characteristic Curves

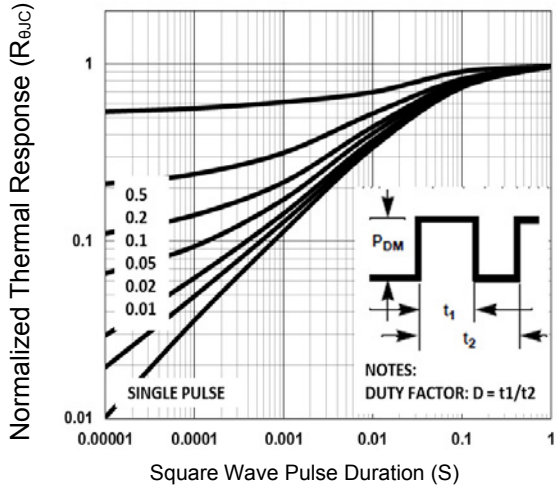


Fig.6 Normalized Transient Impedance

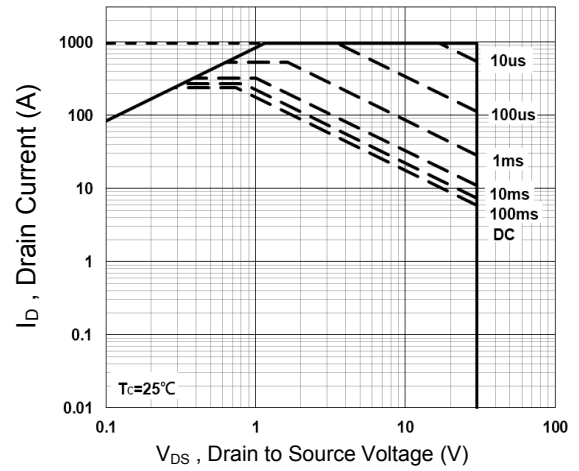


Fig.7 Maximum Safe Operation Area

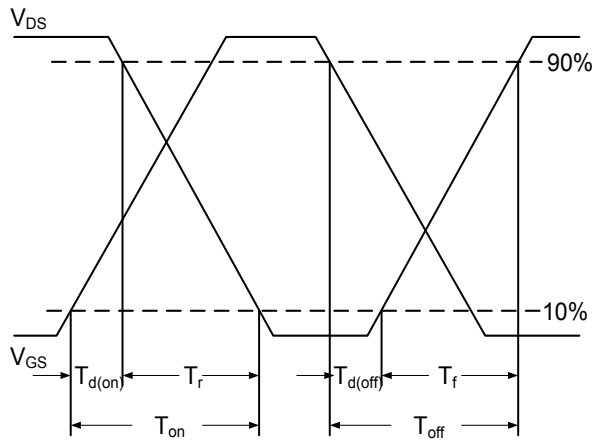


Fig.8 Switching Time Wavform

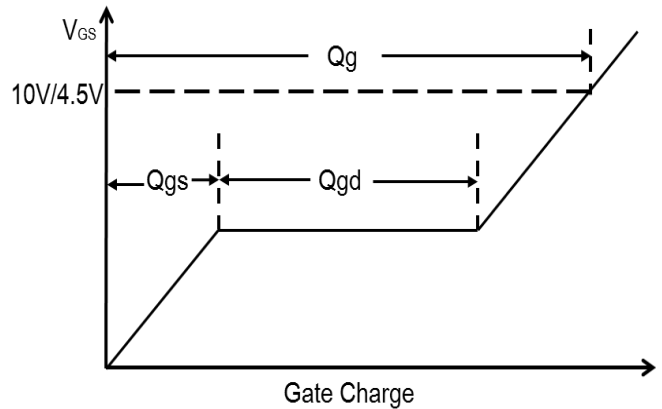
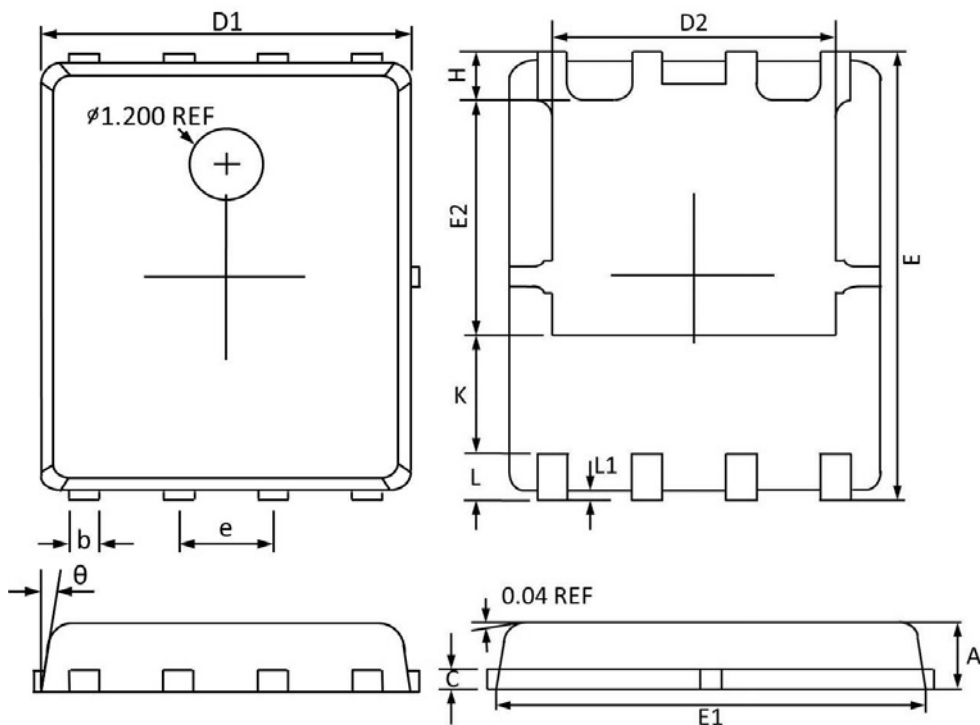


Fig.9 Gate Charge Waveform

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°