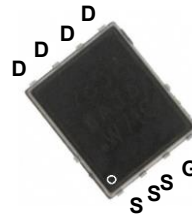
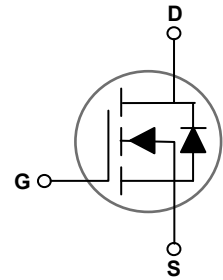


Main Product Characteristics

V_{DSS}	60V
$R_{DS(ON)}$	3.5m Ω (typ.)
I_D	100A



PPAK5X6



Schematic Diagram

Description

SSFP6974 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	Rating	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	+20/-12	V
Drain Current – Continuous ($T_c=25^\circ\text{C}$)	I_D	100	A
Drain Current – Continuous ($T_c=100^\circ\text{C}$)		63	A
Drain Current – Pulsed ¹	I_{DM}	400	A
Single Pulse Avalanche Energy ²	E_{AS}	245	mJ
Single Pulse Avalanche Current ²	I_{AS}	70	A
Power Dissipation ($T_c=25^\circ\text{C}$)	P_D	142	W
Power Dissipation – Derate above 25 $^\circ\text{C}$		1.14	W/ $^\circ\text{C}$
Storage Temperature Range	T_{STG}	-50 to +150	$^\circ\text{C}$
Operating Junction Temperature Range	T_J	-50 to +150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	62	$^\circ\text{C/W}$
Thermal Resistance Junction to Case	$R_{\theta JC}$	0.88	$^\circ\text{C/W}$

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}	$V_{GS}=0V, I_D=250\mu A$	60	---	---	V
BV_{DSS} Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to $25^\circ\text{C}, I_D=1\text{mA}$	---	0.05	---	$V/^\circ\text{C}$
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=48V, V_{GS}=0V, T_J=85^\circ\text{C}$	---	---	10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=20V, V_{DS}=0V$	---	---	100	nA
On Characteristics						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=15A$	---	2.7	3.5	m Ω
		$V_{GS}=6V, I_D=10A$	---	3.5	4.5	m Ω
		$V_{GS}=5V, I_D=5A$	---	5	6.5	m Ω
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1.2	2	3	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		---	-5	---	mV/ $^\circ\text{C}$
Forward Transconductance	g_{fs}	$V_{DS}=10V, I_D=5A$	---	11	---	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{3, 4}	Q_g	$V_{DS}=48V, V_{GS}=10V, I_D=10A$	---	59	120	nC
Gate-Source Charge ^{3, 4}	Q_{gs}		---	10.4	20	
Gate-Drain Charge ^{3, 4}	Q_{gd}		---	19.6	38	
Turn-On Delay Time ^{3, 4}	$T_{d(on)}$	$V_{DD}=30V, V_{GS}=10V, R_G=6\Omega, I_D=1A$	---	22	44	nS
Rise Time ^{3, 4}	T_r		---	14	28	
Turn-Off Delay Time ^{3, 4}	$T_{d(off)}$		---	40	80	
Fall Time ^{3, 4}	T_f		---	20	40	
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V, F=1\text{MHz}$	---	3620	7200	pF
Output Capacitance	C_{oss}		---	2395	4800	
Reverse Transfer Capacitance	C_{rss}		---	177	350	
Gate Resistance	R_g	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	---	1.8	3.6	Ω
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}		---	---	400	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$	---	---	1	V

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. $V_{DD}=25V, V_{GS}=10V, L=0.1\text{mH}, I_{AS}=70A, R_G=25\Omega, \text{Starting } T_J=25^\circ\text{C}.$
3. The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristics

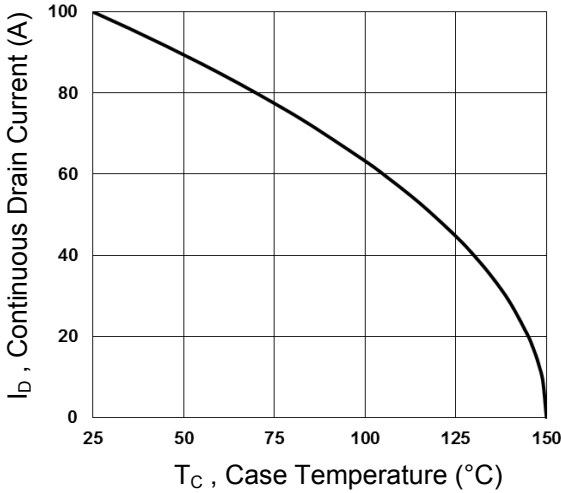


Fig.1 Continuous Drain Current vs. T_C

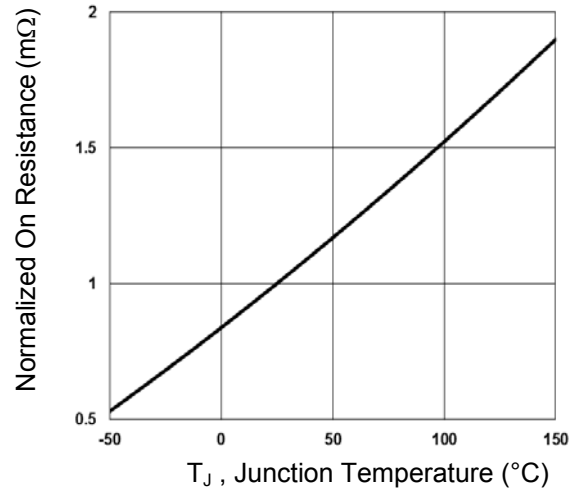


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

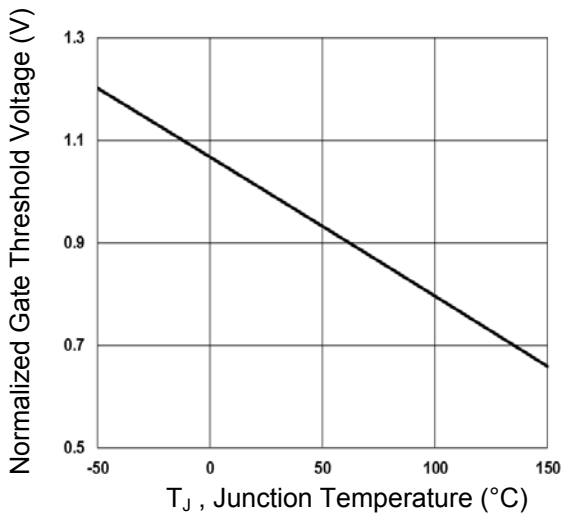


Fig.3 Normalized V_{th} vs. T_J

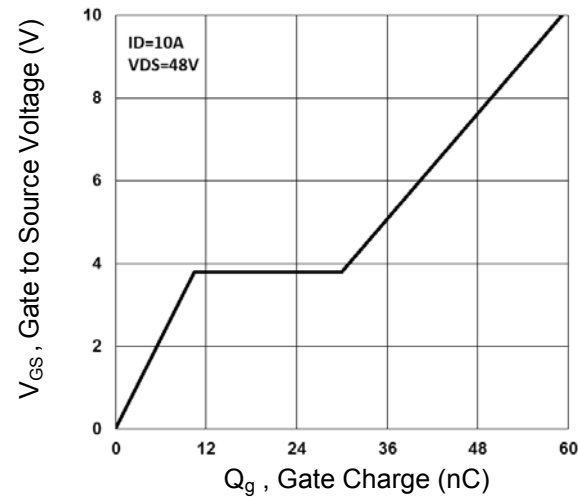


Fig.4 Gate Charge Characteristics

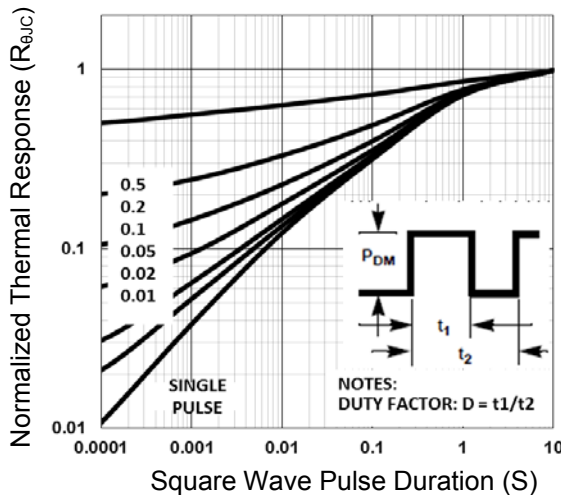


Fig.5 Normalized Transient Impedance

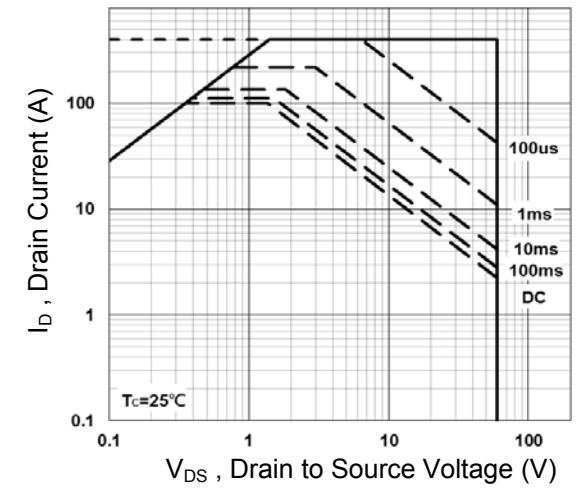


Fig.6 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristics

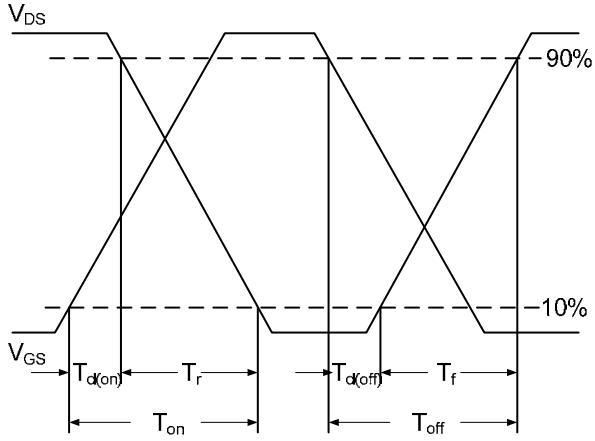


Fig.7 Switching Time Waveform

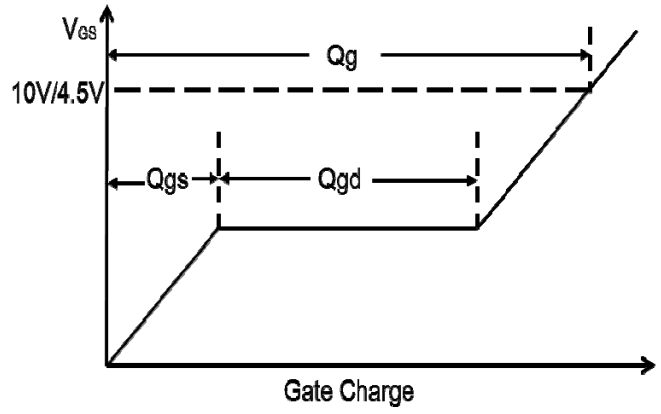
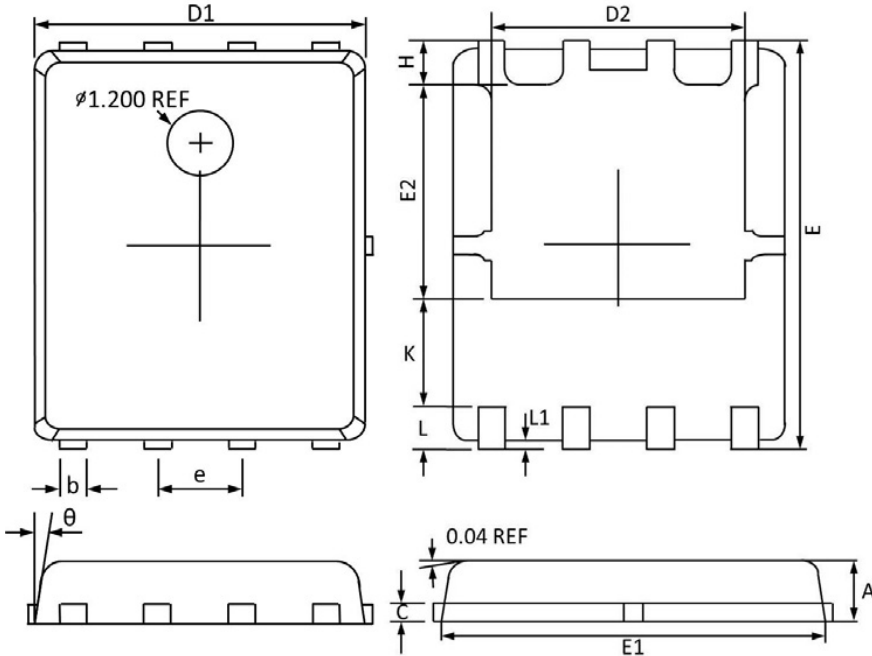


Fig.8 Gate Charge Waveform

Package Information

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°