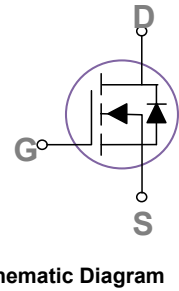


Main Product Characteristics

V_{DSS}	60V
$R_{DS(on)}$	3.5mΩ (typ.)
I_D	100A



Description

SSFP6974 utilizes the latest trench processing techniques to achieve high cell density, low on-resistance and high repetitive avalanche rating. These features make this device extremely efficient and reliable for use in battery protection, power switching and a wide variety of other applications.

Absolute Maximum Ratings ($T_A=25^{\circ}C$ unless otherwise specified)

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

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance Junction to ambient	$R_{\theta JA}$	62	°C/W
Thermal Resistance Junction to Case	$R_{\theta JC}$	0.88	°C/W

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

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	60	-	-	V
BV_{DSS}/T_J	BV_{DSS} Temperature Coefficient	Reference to $25^\circ\text{C}, I_D=1\text{mA}$	-	0.05	-	$V/^\circ\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=60V, V_{GS}=0V, T_J=25^\circ\text{C}$	-	-	1	μA
		$V_{DS}=48V, V_{GS}=0V, T_J=85^\circ\text{C}$	-	-	10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=20V, V_{DS}=0V$	-	-	100	nA

On Characteristics

$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=15A$	-	2.7	3.5	mW
		$V_{GS}=6V, I_D=10A$	-	3.5	4.5	mW
		$V_{GS}=5V, I_D=5A$	-	5	6.5	mW
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	1.2	2	3	V
$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		-	-5	-	$\text{mV}/^\circ\text{C}$
gfs	Forward Transconductance	$V_{DS}=10V, I_D=5A$	-	11	-	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge _{3, 4}	$V_{DS}=48V, V_{GS}=10V, I_D=10A$	-	59	120	nC
Q_{gs}	Gate-Source Charge _{3, 4}		-	10.4	20	
Q_{gd}	Gate-Drain Charge _{3, 4}		-	19.6	38	
$T_{d(on)}$	Turn-On Delay Time _{3, 4}	$V_{DD}=30V, V_{GS}=10V, R_G=6W, I_D=1A$	-	22	44	ns
T_r	Rise Time _{3, 4}		-	14	28	
$T_{d(off)}$	Turn-Off Delay Time _{3, 4}		-	40	80	
T_f	Fall Time _{3, 4}		-	20	40	
C_{iss}	Input Capacitance	$V_{DS}=25V, V_{GS}=0V, F=1\text{MHz}$	-	3620	7200	pF
C_{oss}	Output Capacitance		-	2395	4800	
C_{rss}	Reverse Transfer Capacitance		-	177	350	
R_g	Gate resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	-	1.8	3.6	W

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V, \text{Force Current}$	-	-	100	A
I_{SM}	Pulsed Source Current		-	-	200	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$	-	-	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 $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristics

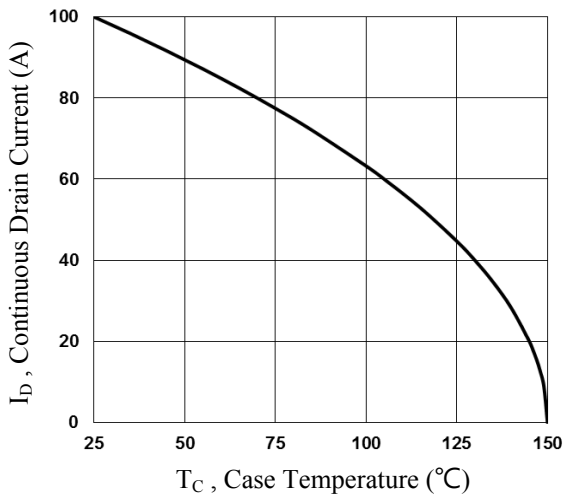


Fig.1 Continuous Drain Current vs. T_C

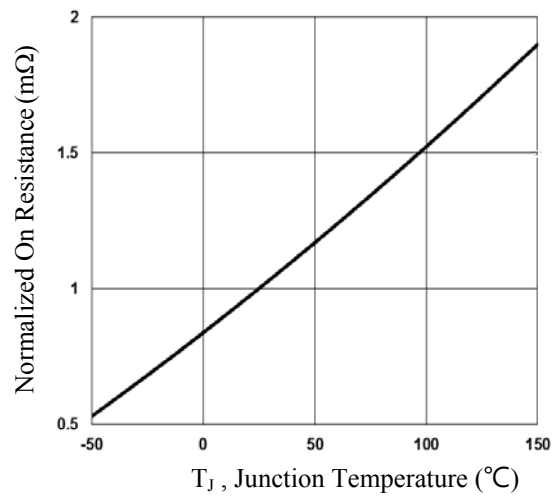


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

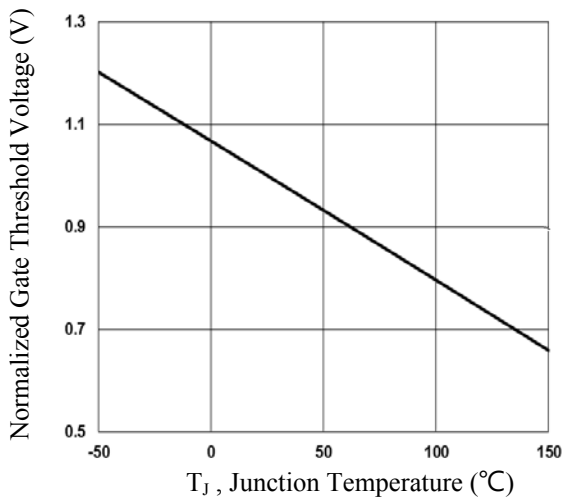


Fig.3 Normalized V_{th} vs. T_J

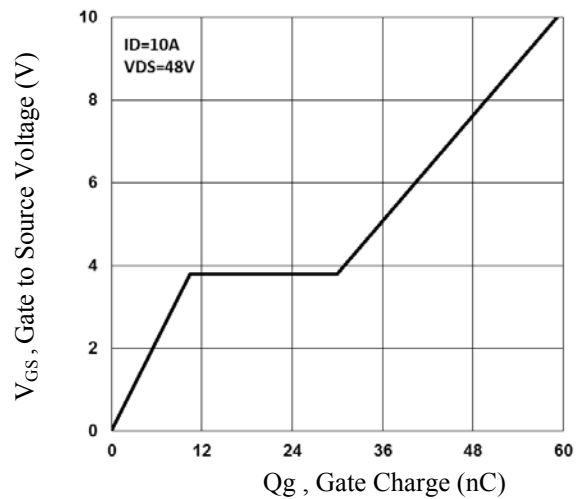


Fig.4 Gate Charge Characteristics

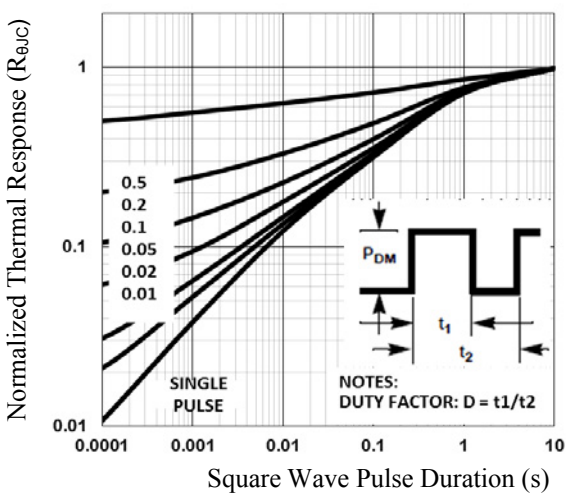


Fig.5 Normalized Transient Impedance

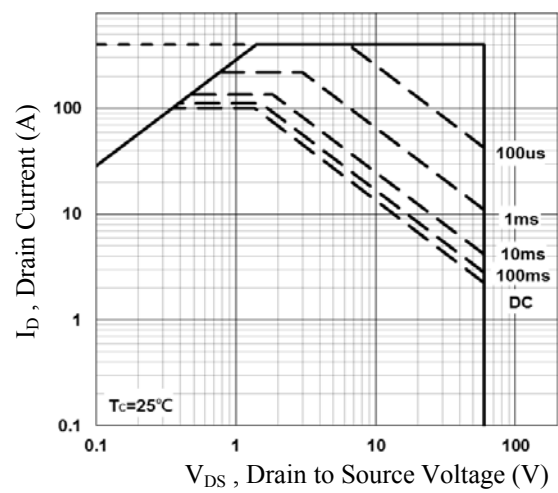


Fig.6 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristics

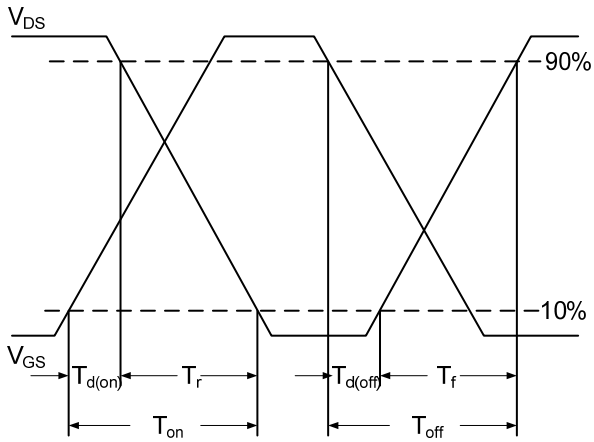


Fig.7 Switching Time Waveform

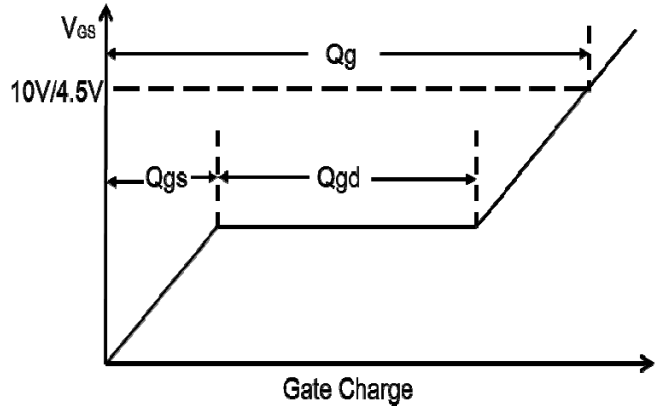
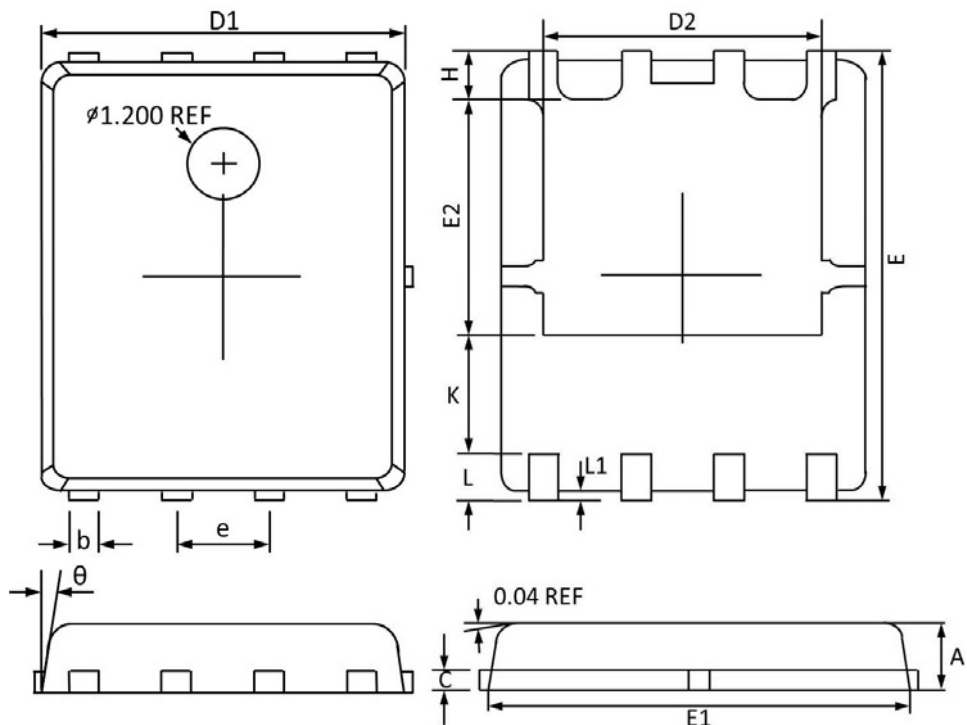


Fig.8 Gate Charge Waveform

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
theta	12°	0°	12°	0°