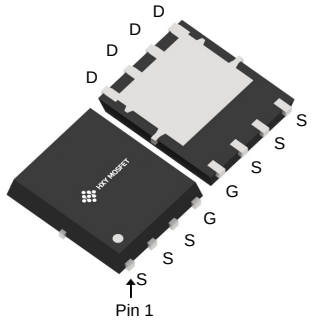
SIR401DP-T1-GE3

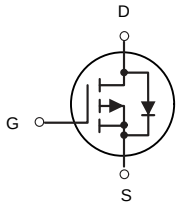
P-Channel Enhancement Mode MOSFET

Description

The SIR401DP-T1-GE3 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



DFN5X6-8L
(PowerPAK-SO-8)



P-Channel MOSFET

General Features

V_{DS} = -18V I_D =-80A

$R_{DS(ON)}$ <3 mΩ V_{GS}=-10V

Application

Battery protection

Load switch

Uninterruptible power supply

Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
SIR401DP-T1-GE3	DFN5X6-8L (PowerPAK-SO-8)	HXY MOSFET	5000

Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-18	V
V_{GS}	Gate-Source Voltage	±12	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	-80	A
I_{DM}	Pulsed Drain Current[2]	-360	A
P_D@T_C=25℃	Total Power Dissipation[4]	41.67	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	62	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	3	℃/W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250uA	-18	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=-1mA	---	-0.008	---	V/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-20V , V_{GS}=0V , T_J=25℃	---	---	-1	uA
		V_{DS}=-16V , V_{GS}=0V , T_J=125℃	---	---	-30	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±12V , V_{DS}=0V	---	---	±500	nA
$R_{DS(ON)}$	Static Drain-Source On-Resistance					mΩ
		V_{GS}=-4.5V , I_D=-20A	---	2.5	3.0	
		V_{GS}=-2.5V , I_D=-20A	---	3.3	4.5	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =-250uA	-0.4	-0.6	-1.0	V
$\triangle V_{GS}$	$V_{GS(th)}$ Temperature Coefficient		---	-3.44	---	mV/℃
gfs	Forward Transconductance	V_{DS}=-10V , I_S=-3A	---	30	---	S
Q_g	Total Gate Charge[2,3]	V_{DS}=-16V , V_{GS}=-4.5V , I_D=-5A	---	149	225	nC
Q_{gs}	Gate-Source Charge[2,3]		---	14.4	22	
Q_{gd}	Gate-Drain Charge[2,3]		---	42.8	65	
$T_{d(on)}$	Turn-On Delay Time[2,3]	V_{DD}=-15V , V_{GS}=-4.5V , R_G=25Ω I_D=-1A	---	21.2	42	nS
T_r	Rise Time[2,3]		---	20.6	40	
$T_{d(off)}$	Turn-Off Delay Time[2,3]		---	26	52	
T_f	Fall Time[2,3]		---	400	600	
C_{iss}	Input Capacitance	V_{DS}=-15V , V_{GS}=0V , F=1MHz	---	12000	16000	pF
C_{oss}	Output Capacitance		---	1670	2500	
C_{rss}	Reverse Transfer Capacitance		---	730	1100	
Rg	Gate resistance	V_{GS}=0V, V_{DS}=0V, F=1MHz	---	2.6	---	Ω
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	-85	A
I_{SM}	Pulsed Source Current		---	---	-190	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=-1A , T_J=25℃	---	---	-1	V

Note :
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
3. Essentially independent of operating temperature.

Typical Performance Characteristics

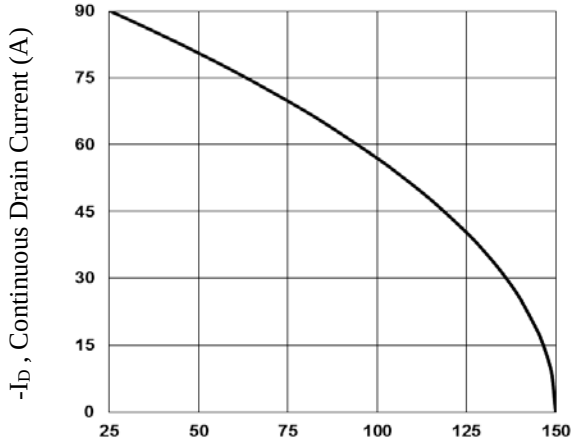


Fig.1 Continuous Drain Current vs. T_C

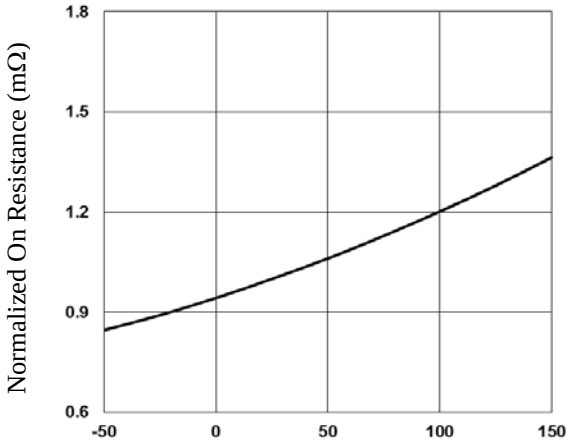


Fig.2 Normalized RDSON vs. T_J

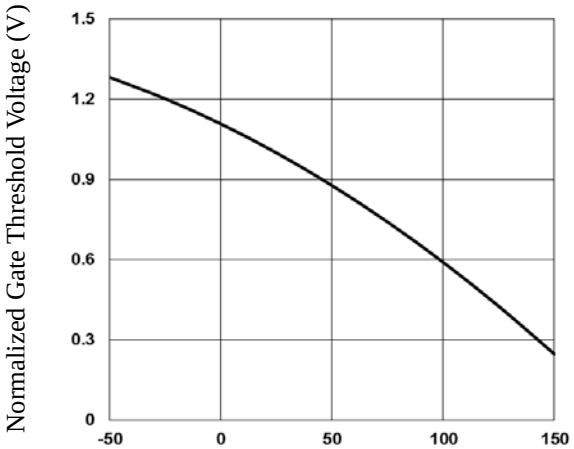


Fig.3 Normalized V_{th} vs. T_J

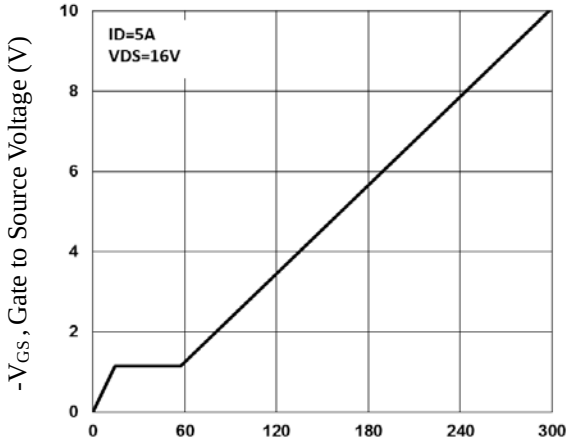


Fig.4 Gate Charge Waveform

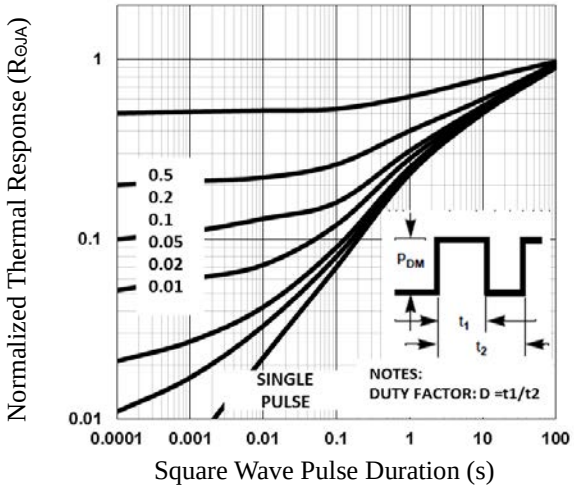


Fig.5 Normalized Transient Response

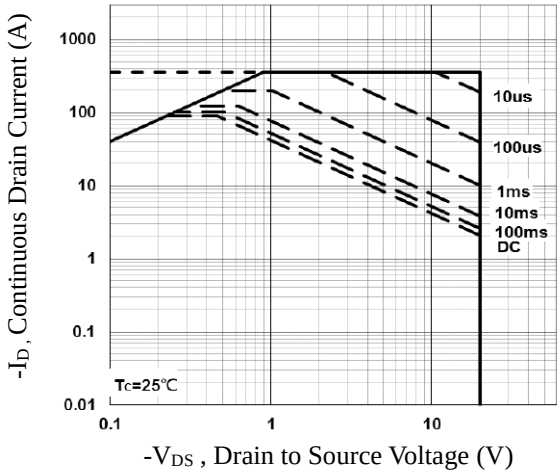


Fig.6 Maximum Safe Operation Area

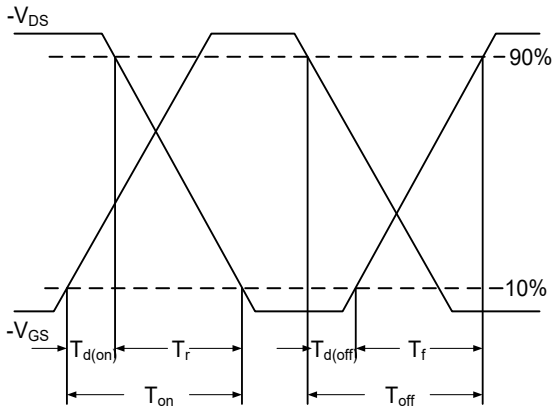


Fig.7 Switching Time Waveform

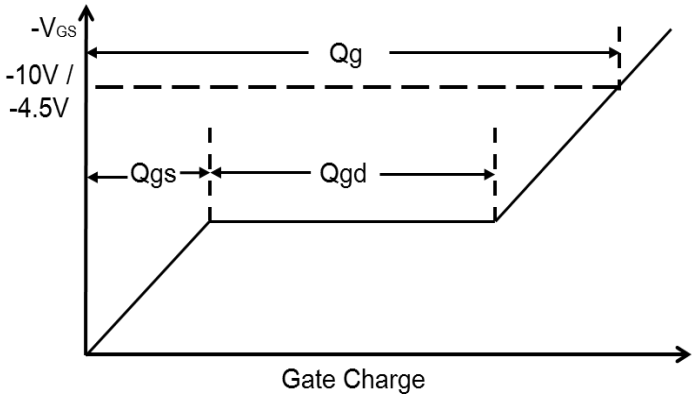
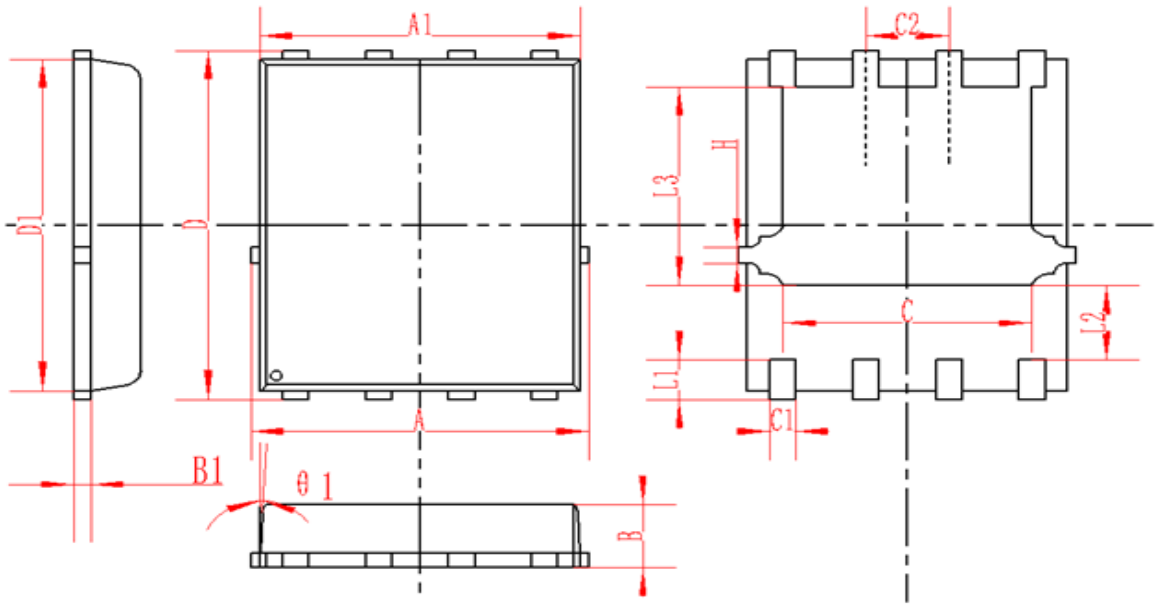


Fig.8 Gate Charge Waveform

DFN3X3-8L(PowerPAK-SO-8) Package Information



SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.95	5	5.05	0.195	0.197	0.199
A1	4.82	4.9	4.98	0.190	0.193	0.196
D	5.98	6	6.02	0.235	0.236	0.237
D1	5.67	5.75	5.83	0.223	0.226	0.230
B	0.9	0.95	1	0.035	0.037	0.039
B1	0.254REF			0.010REF		
C	3.95	4	4.05	0.156	0.157	0.159
C1	0.35	0.4	0.45	0.014	0.016	0.018
C2	1.27TYP			0.5TYP		
θ1	8°	10°	12°	8°	10°	12°
L1	0.63	0.64	0.65	0.025	0.025	0.026
L2	1.2	1.3	1.4	0.047	0.051	0.055
L3	3.415	3.42	3.425	0.134	0.135	0.135
H	0.24	0.25	0.26	0.009	0.010	0.010

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