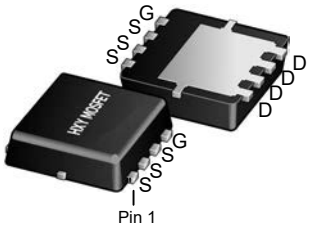
Description

The UPA2815T1S uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

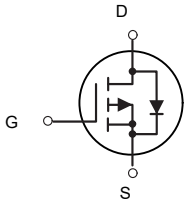


DFN3X3-8L
(HWSON-8(3.3x3.3))

General Features

V_{DS} = -20V I_D =- 48A

$R_{DS(ON)}$ < 10m Ω @ V_{GS}=-4.5 V



P-Channel MOSFET

Application

Battery protection

Load switch

Uninterruptible power supply

Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
UPA2815T1S	DFN3X3-8L (HWSON-8(3.3x3.3))	HXY MOSFET	5000

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	±8	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ -4.5V[1]	-48	A
I_D@T_C=70℃	Continuous Drain Current, V_{GS} @ -4.5V[1]	-35	A
I_{DM}	Pulsed Drain Current[2]	-100	A
P_D@T_C=25℃	Total Power Dissipation[3]	29	W
P_D@T_C=70℃	Total Power Dissipation[3]	19	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]	75	℃/W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1] (t ≤10s)	40	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	4.2	℃/W

Electrical Characteristics (TA=25 °C unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250uA	-20	-24	---	V
□ BV_{DSS}/ □ T_J	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=-1mA	---	-0.012	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=-4.5V , I_D=-10A	---	7.5	10	mΩ
		V_{GS}=-2.5V , I_D=-8A	---	8.7	11.5	
		V_{GS}=-1.8V , I_D=-6A	---	13	15	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =-250uA	-0.3	0.6	-1.0	V
□ $V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	2.94	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-20V , V_{GS}=0V , T_J=25℃	---	---	1	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±8V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=-5V , I_D=-10A	---	43	---	S
Q_g	Total Gate Charge (-4.5V)	V_{DS}=-15V , V_{GS}=-4.5V , I_D=-10A	---	63	---	nC
Q_{gs}	Gate-Source Charge		---	9.1	---	
Q_{gd}	Gate-Drain Charge		---	13	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=-10V , V_{GS}=-4.5V , R_G=3.3 , I_D=-10A	---	15.8	---	ns
T_r	Rise Time		---	76.8	---	
$T_{d(off)}$	Turn-Off Delay Time		---	193	---	
T_f	Fall Time		---	186.4	---	
C_{iss}	Input Capacitance	V_{DS}=-15V , V_{GS}=0V , f=1MHz	---	5783	---	pF
C_{oss}	Output Capacitance		---	509	---	
C_{rss}	Reverse Transfer Capacitance		---	431	---	
I_S	Continuous Source Current[1,4]	V_G=V_D=0V , Force Current	---	---	-10.7	A
I_{SM}	Pulsed Source Current[2,4]		---	---	-60	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=-1A , T_J=25℃	---	---	-1.2	V
t_{rr}	Reverse Recovery Time	IF=-10A , dI/dt=100A/μs , T_J =25℃	---	27	---	nS
Q_{rr}	Reverse Recovery Charge		---	17.8	---	nC

Note :
1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3.The power dissipation is limited by 150℃ junction temperature
4.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

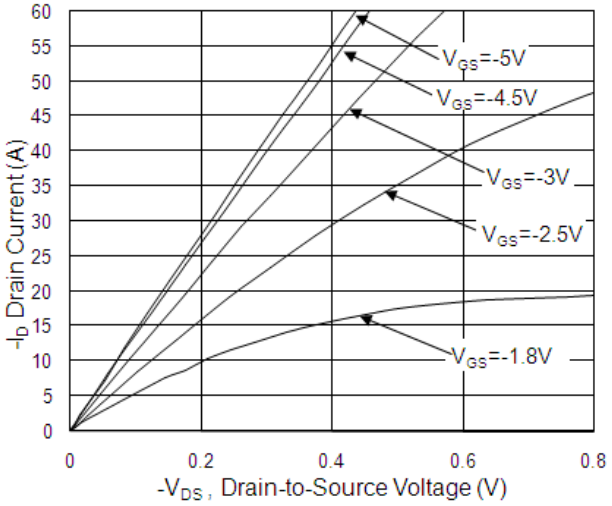


Fig.1 Typical Output Characteristics

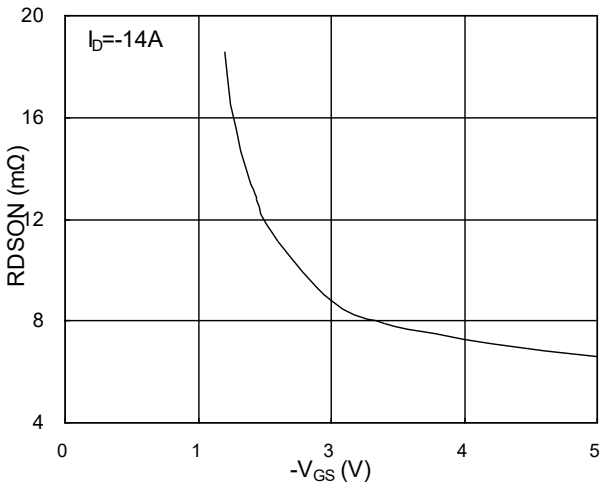


Fig.2 On-Resistance vs. G-S Voltage

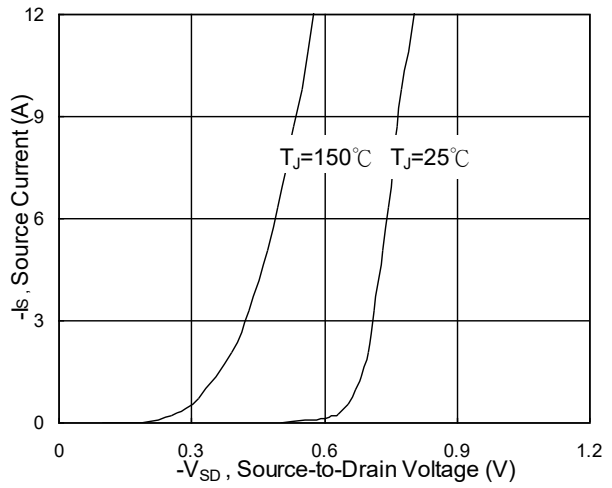


Fig.3 Forward Characteristics of Reverse

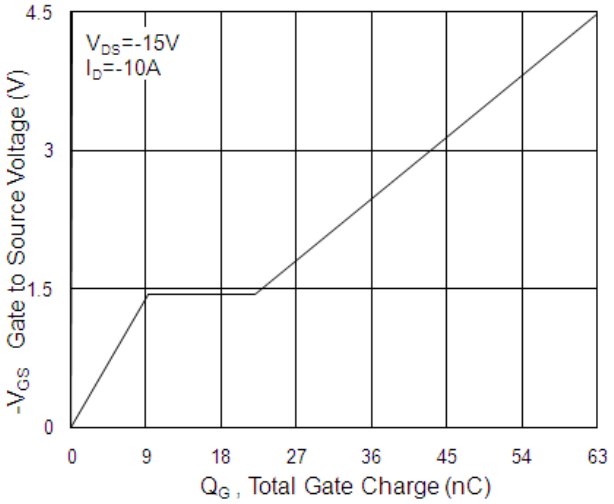


Fig.4 Gate-charge Characteristics

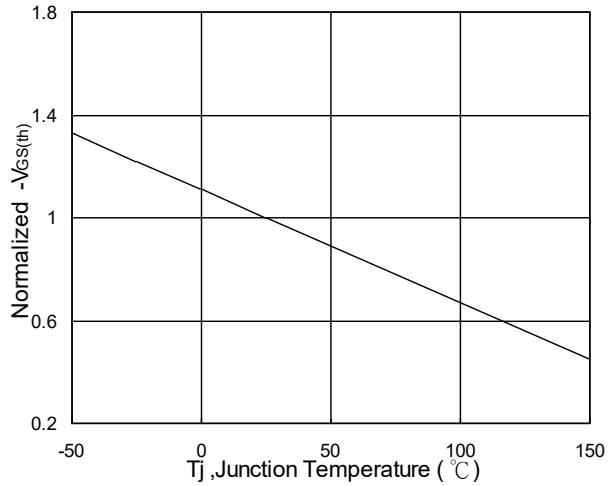


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

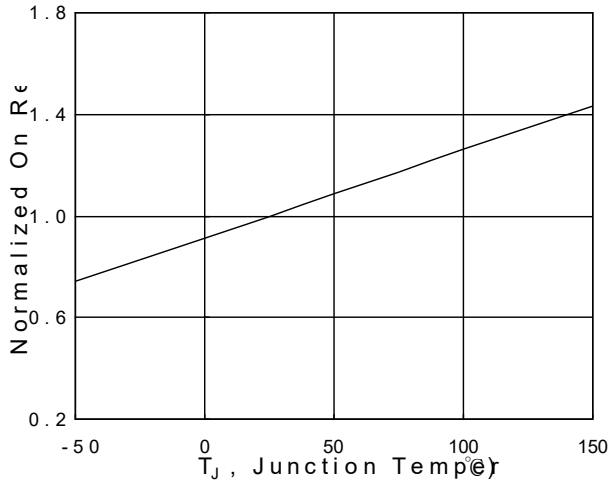


Fig.6 Normalized R_{DSON} vs. T_J

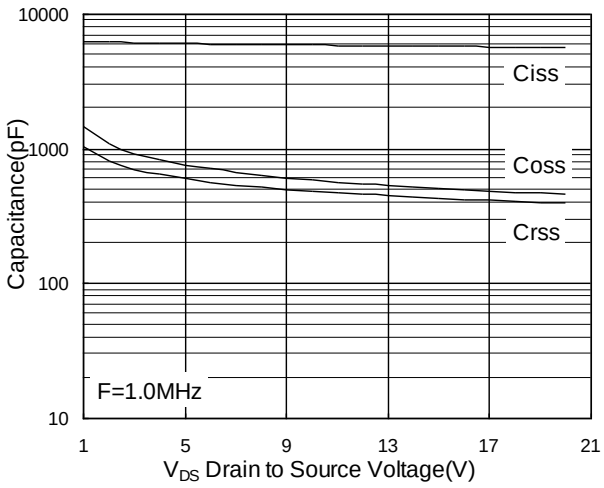


Fig.7 Capacitance

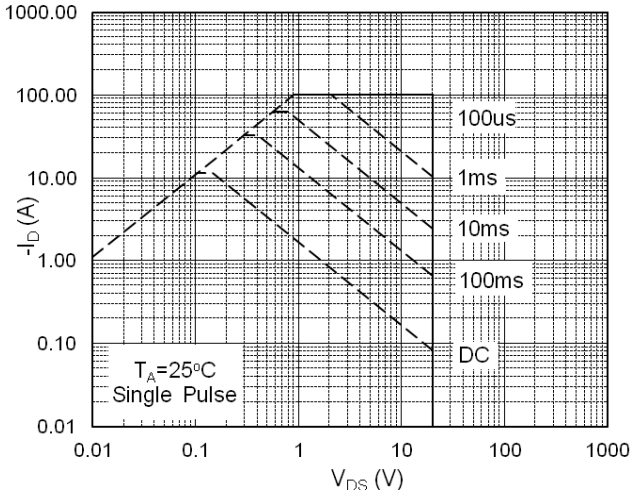


Fig.8 Safe Operating Area

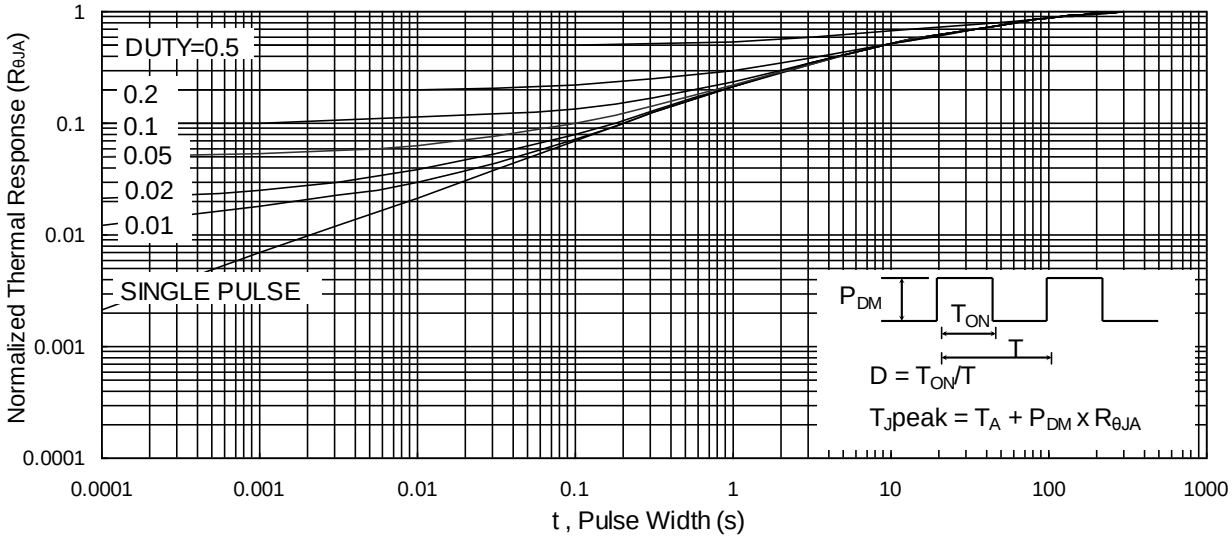


Fig.9 Normalized Maximum Transient Thermal Impedance

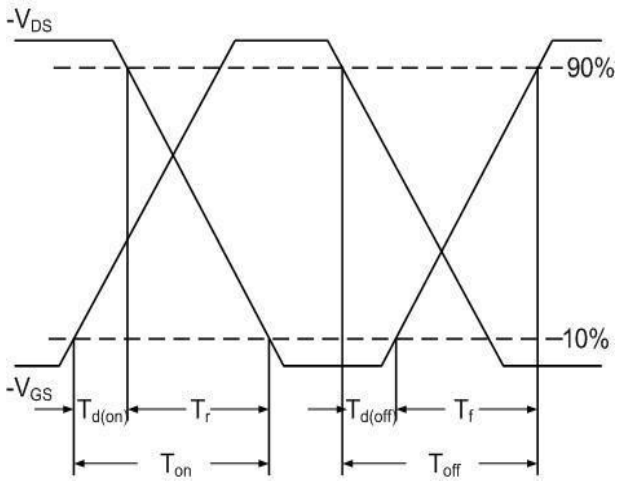


Fig.10 Switching Time Waveform

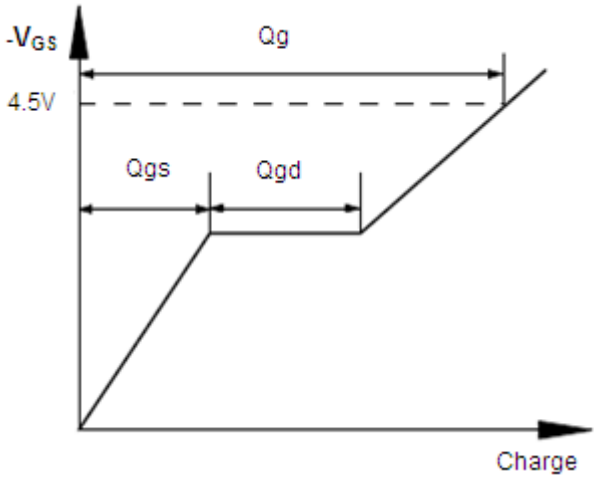
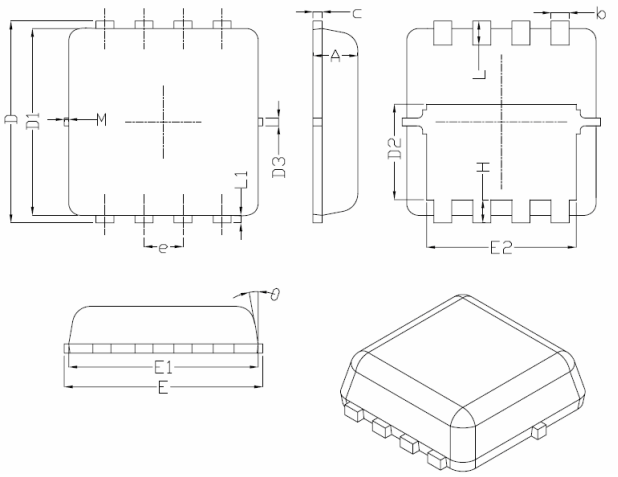


Fig.11 Gate Charge Waveform

DFN3X3-8L(HWSON-8(3.3x3.3)) Package Information



Symbol	Dimensions In Millimeters		
	Min.	Nom.	Max.
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.48	1.58	1.68
D3	-	0.13	-
E	3.20	3.30	3.40
E1	3.00	3.15	3.20
E2	2.39	2.49	2.59
e	0.65BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	-	0.13	-
M	*	*	0.15
θ		10°	12°

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