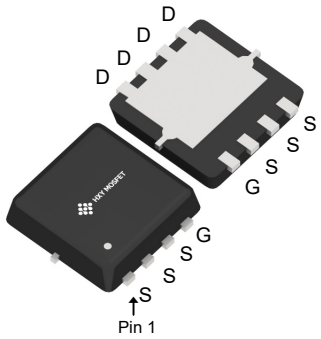
IPZ40N04S5L4R8ATMA1

N-Channel Enhancement Mode MOSFET

Description

The IPZ40N04S5L4R8ATMA1 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.

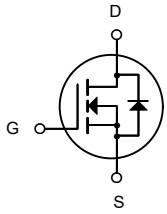


DFN3X3-8L

General Features

V_{DS} = 40V I_D = 70A

$R_{DS(ON)}$ < 5.5mΩ @ V_{GS}=10V



N-Channel MOSFET

Application

Battery protection

Load switch

Uninterruptible power supply

Ordering Information

Product ID	Pack	Brand	Qty(PCS)
IPZ40N04S5L4R8ATMA1	DFN3X3-8L	HXY MOSFET	5000

Absolute Maximum Ratings (Tc=25°C unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V	70	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V	44.3	A
I_{DM}	Pulsed Drain Current	280	A
EAS	Single Pulse Avalanche Energy	100	mJ
I_{AS}	Avalanche Current	22	A
P_D@T_C=25℃	Total Power Dissipation	52	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	62	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case	2.4	℃/W

Electrical Characteristics (T_J=25°C, unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	40	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=40V	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V V_{DS}=0A	---	---	±100	nA
$V_{GS(th)}$	Gate-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	1.0	1.6	2.1	V
$R_{DS(ON)}$	Drain-Source On Resistance[4]	V_{GS}=10V,I_D=20A	---	4.2	5.5	mΩ
		V_{GS}=4.5V,I_D=10A	---	5.5	7	
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1MHz	---	2800	---	pF
C_{oss}	Output Capacitance		---	233	--	
C_{rss}	Reverse Transfer Capacitance		---	152	---	
$t_{d(on)}$	Turn-On Delay Time	V_{DS}=20V, I_D=1A, R_G=3.3Ω,V_{GS}10V	---	14.2	---	ns
t_r	Rise Time		---	18.3	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	38.8	---	ns
t_f	Fall Time		---	13.9	---	ns
Q_g	Total Gate Charge	V_{GS}=4.5V, V_{DS}=32V, I_D=10A	---	25	---	nC
Q_{gs}	Gate-Source Charge		---	6.4	---	nC
Q_{gd}	Gate-Drain “Miller” Charge		---	12.1	---	nC
V_{SD}	Diode Forward Voltage	V_{GS}=0V, I_{SD}=1A	---	---	1	V
I_S	Continuous Drain Curren	V_D=V_G=0V	---	---	70	A
I_{SM}	Pulsed Drain Current		---	---	280	A

Notes:

1. Computed continuous current assumes the condition of $T_{j,Max}$ while the actual continuous current depends on the thermal & electro-mechanical application board design
2. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
3. EAS condition : TJ=25℃,VDD=20 V,VG=10V,L=0.5mH
4. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Characteristics

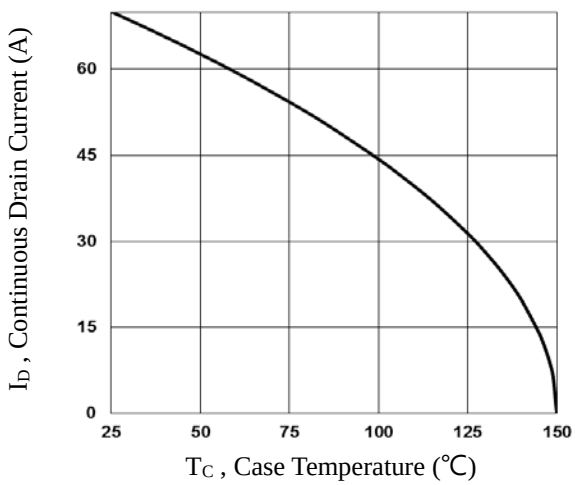


Fig.1 Continuous Drain Current vs. T_C

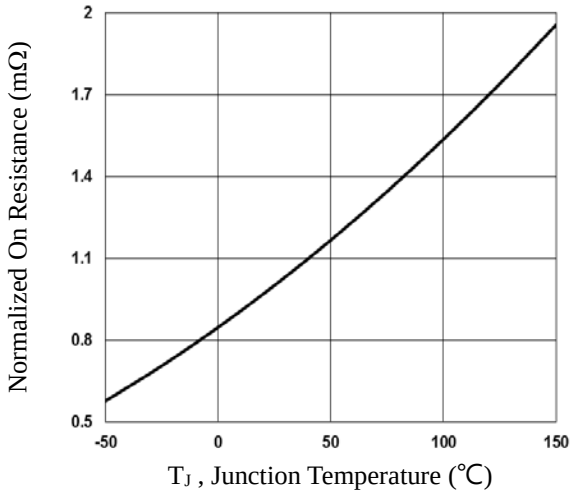


Fig.2 Normalized RDSON vs. T_J

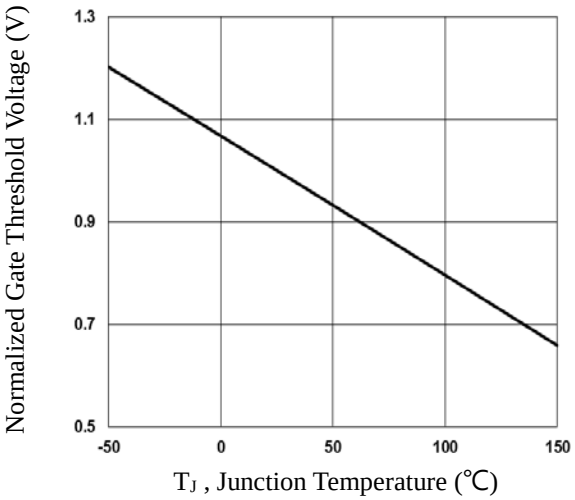


Fig.3 Normalized V_{th} vs. T_J

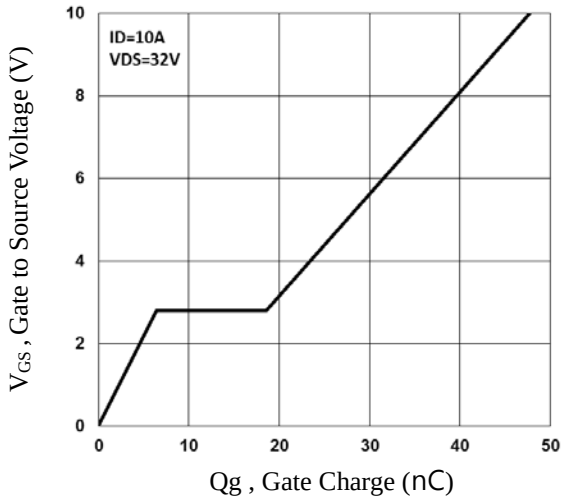


Fig.4 Gate Charge Waveform

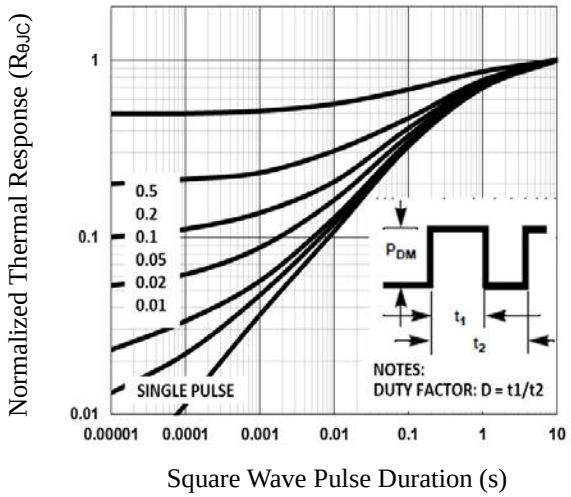


Fig.5 Normalized Transient Impedance

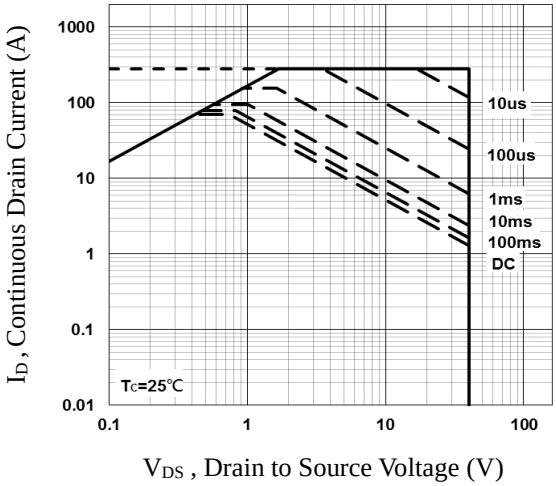


Fig.6 Maximum Safe Operation Area

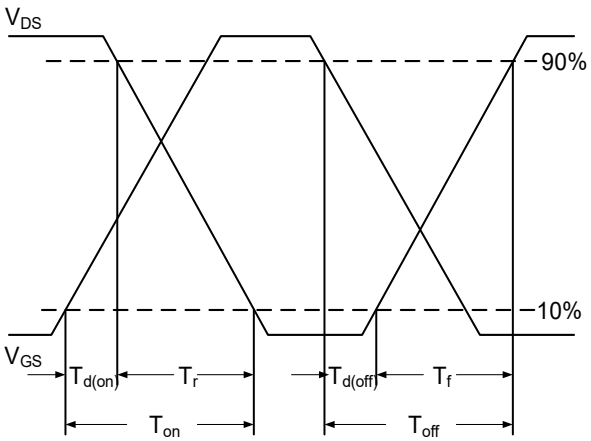


Fig.7 Switching Time Waveform

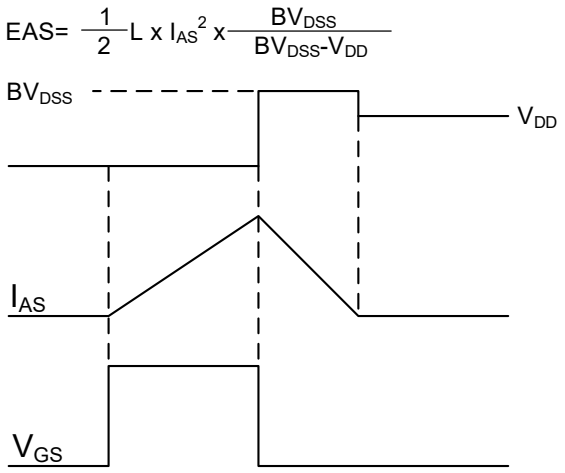
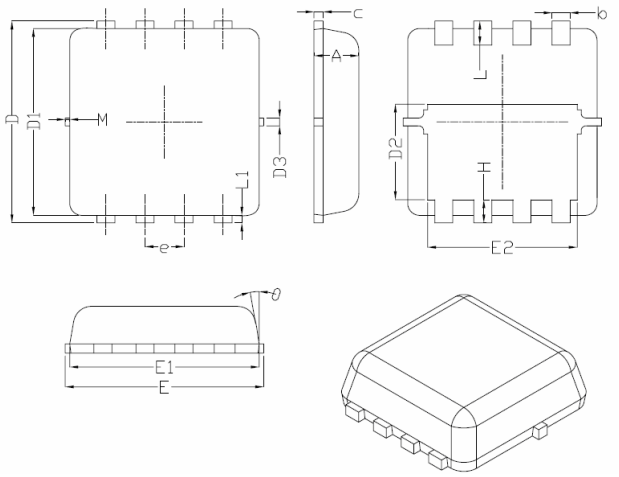


Fig.8 EAS Waveform

DFN3X3-8L 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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