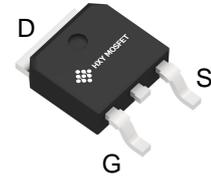




Description

The IPD047N03LF2SATMA1 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.



TO-252-2L

General Features

$V_{DS} = 30V$ $I_D = 100A$

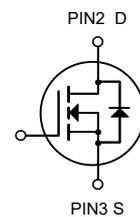
$R_{DS(ON)} < 5.5m\Omega @ V_{GS}=10V$

Application

Battery protection

Load switch

Uninterruptible power supply



N-Channel MOSFET

Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
IPD047N03LF2SATMA1	TO-252-2L	HXY MOSFET	2500

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

Symbol	Parameter	Rating	Units	
V _{DS}	Drain- Source Voltage	30	V	
V _{GS}	Gate-Source Voltage	±20	V	
I _{D@Tc=25°C}	Continuous Drain Current, V _{GS} @ 10V ¹	100	A	
I _{D@Tc=100°C}	Continuous Drain Current, V _{GS} @ 10V ¹	57	A	
I _{D@TA=25°C}	Continuous Drain Current, V _{GS} @ 10V ¹	27	17	A
I _{D@TA=70°C}	Continuous Drain Current, V _{GS} @ 10V ¹	23	14.5	A
I _{DM}	Pulsed Drain Current ²	160	A	
E _{AS}	Single Pulse Avalanche Energy ³	115.2	mJ	
I _{AS}	Avalanche Current	48	A	
P _{D@Tc=25°C}	Total Power Dissipation ⁴	53	W	
P _{D@TA=25°C}	Total Power Dissipation ⁴	6	2.4	W
T _{STG}	Storage Temperature Range	-55 to 175	°C	
T _J	Operating Junction Temperature Range	-55 to 175	°C	
R _{θJA}	Thermal Resistance Junction-ambient (Steady State) ¹	62	°C/W	
R _{θJA}	Thermal Resistance Junction-Ambient ¹ (t ≤10s)	25	°C/W	
R _{θJC}	Thermal Resistance Junction-Case ¹	2.8	°C/W	



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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	30	---	---	V
ΔBV _{DSS} /ΔT _J	BVDSS Temperature Coefficient	Reference to 25°C, I _D =1mA	---	0.028	---	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =30A	---	3.8	5.5	mΩ
		V _{GS} =4.5V, I _D =15A	---	7.5	9	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.0	1.5	2.5	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	-6.16	---	mV/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =24V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =24V, V _{GS} =0V, T _J =55°C	---	---	5	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =30A	---	22	---	S
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	1.7	3.4	Ω
Q _g	Total Gate Charge (4.5V)	V _{DS} =15V, V _{GS} =4.5V, I _D =15A	---	20	---	nC
Q _{gs}	Gate-Source Charge		---	7.6	---	
Q _{gd}	Gate-Drain Charge		---	7.2	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =15V, V _{GS} =10V, R _G =3.3, I _D =15A	---	7.8	---	ns
T _r	Rise Time		---	15	---	
T _{d(off)}	Turn-Off Delay Time		---	37.3	---	
T _f	Fall Time		---	10.6	---	
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	---	2295	---	pF
C _{oss}	Output Capacitance		---	267	---	
C _{rss}	Reverse Transfer Capacitance		---	210	---	
I _S	Continuous Source Current ^{1,5}	V _G =V _D =0V, Force Current	---	---	80	A
I _{SM}	Pulsed Source Current ^{2,5}		---	---	160	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	1	V
t _{rr}	Reverse Recovery Time	I _F =30A, dI/dt=100A/μs, T _J =25°C	---	14	---	nS
Q _{rr}	Reverse Recovery Charge	T _J =25°C	---	5	---	nC

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width .The EAS data shows Max. rating .
- 3.The test cond_≤ 300us , duty cycle ition is V_{DD=25}≤V, V 2%_{GS} =10V,L=0.1mH,I_{AS}=53.8A
- 4.The power dissipation is limited by 175°C junction temperature
- 5.The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.



Typical Characteristics

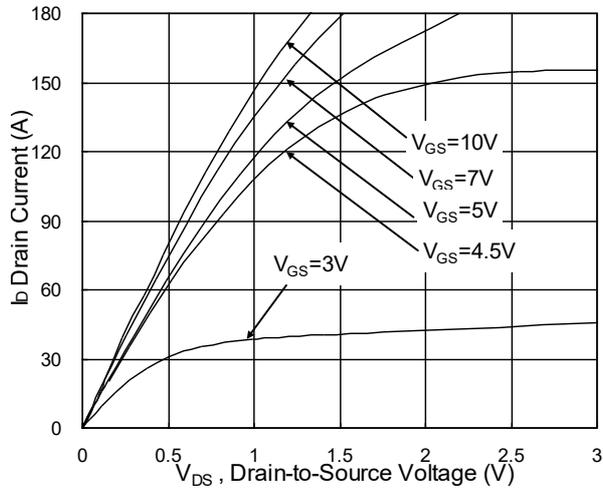


Fig.1 Typical Output Characteristics

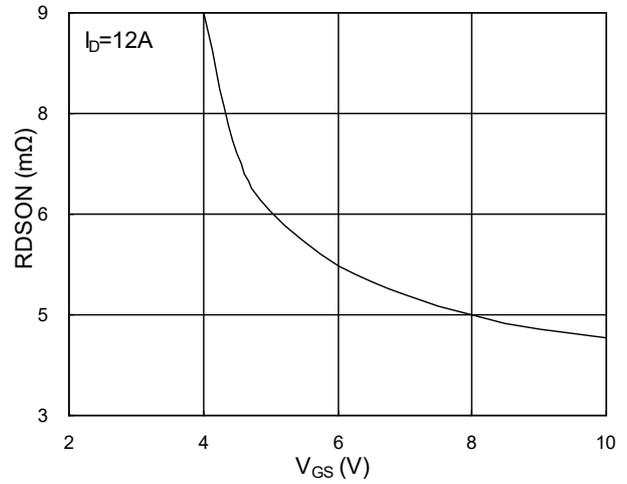


Fig.2 On-Resistance vs. G-S Voltage

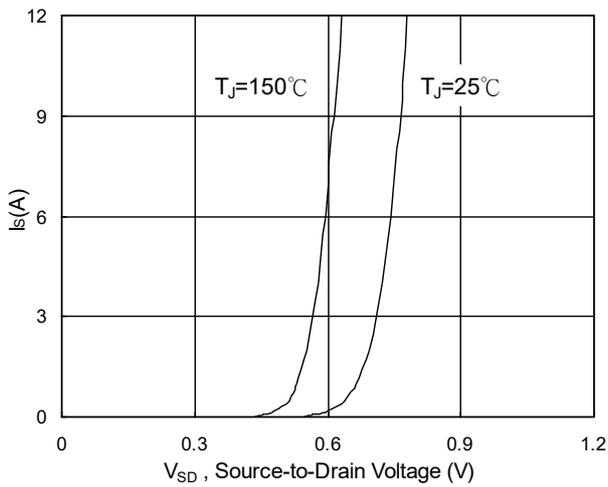


Fig.3 Forward Characteristics of Reverse

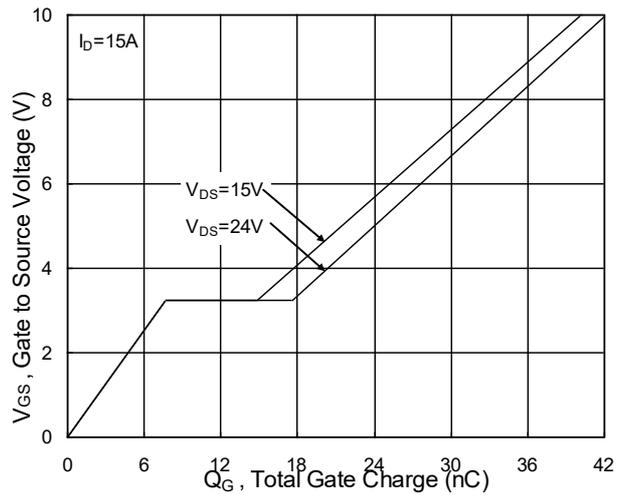


Fig.4 Gate-Charge Characteristics

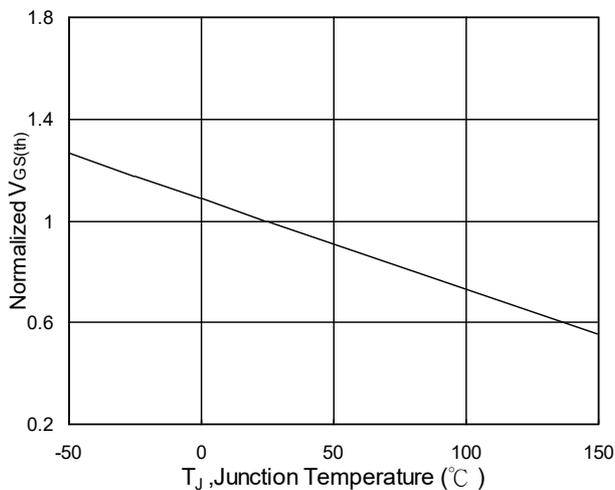


Fig.5 Normalized VGS(th) vs. TJ

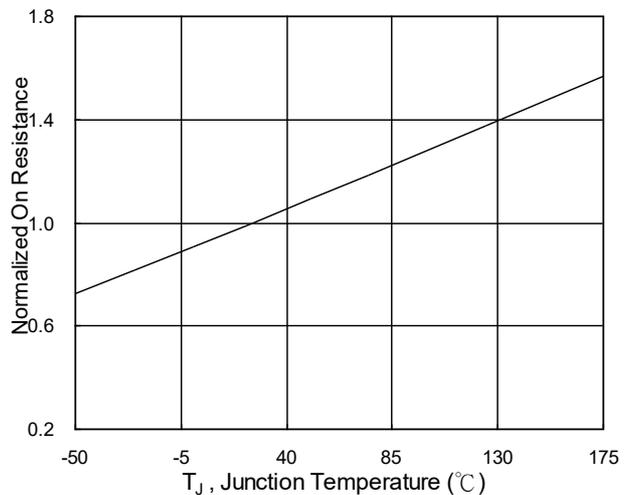


Fig.6 Normalized RDSON vs. TJ

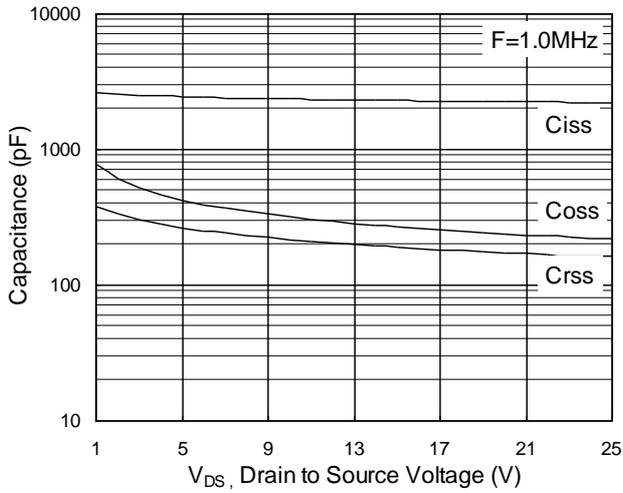


Fig.7 Capacitance

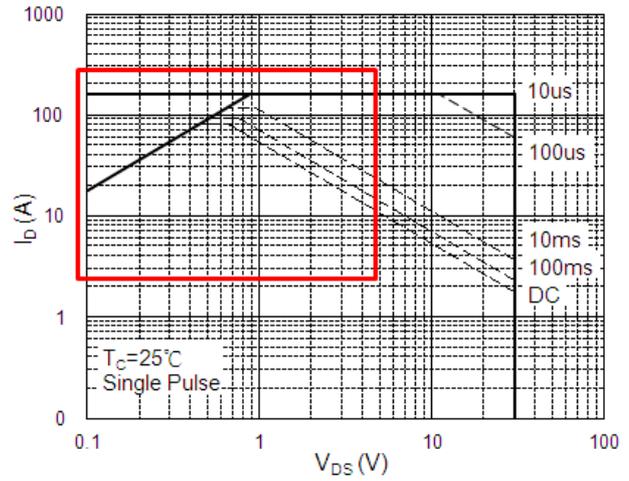


Fig.8 Safe Operating Area

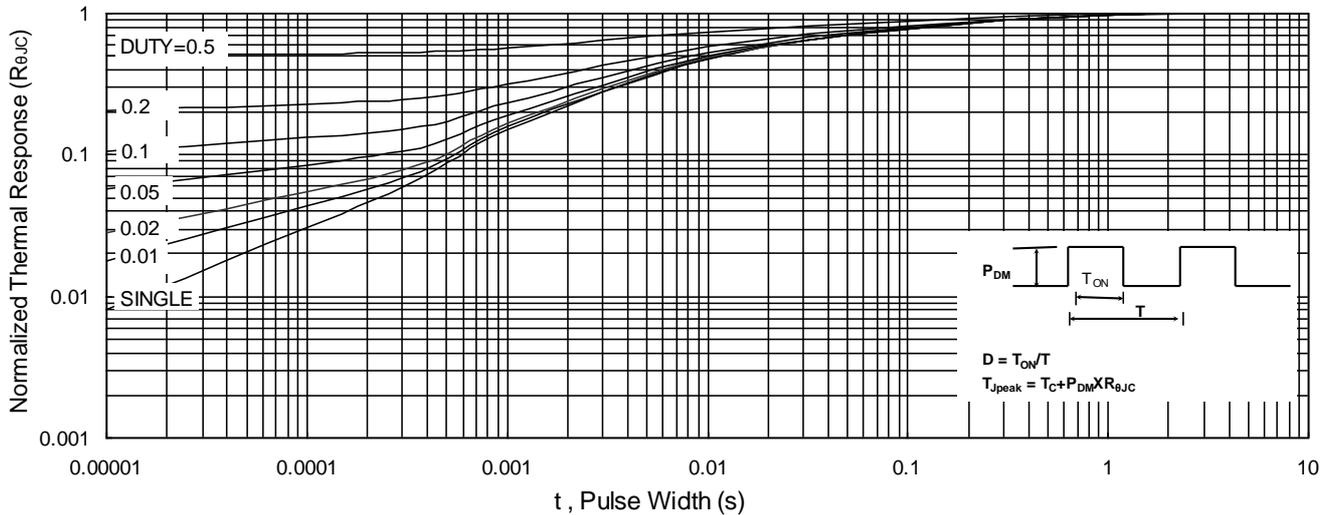


Fig.9 Normalized Maximum Transient Thermal Impedance

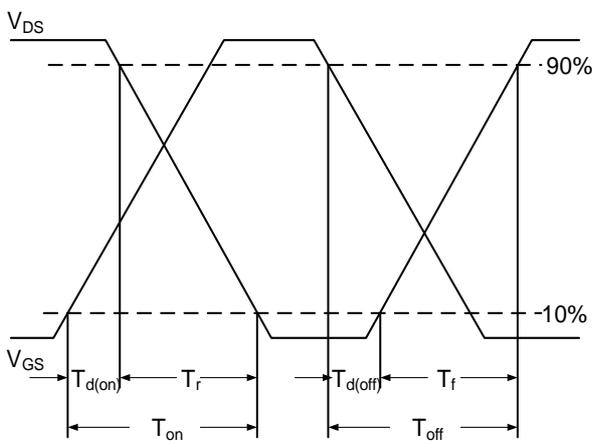


Fig.10 Switching Time Waveform

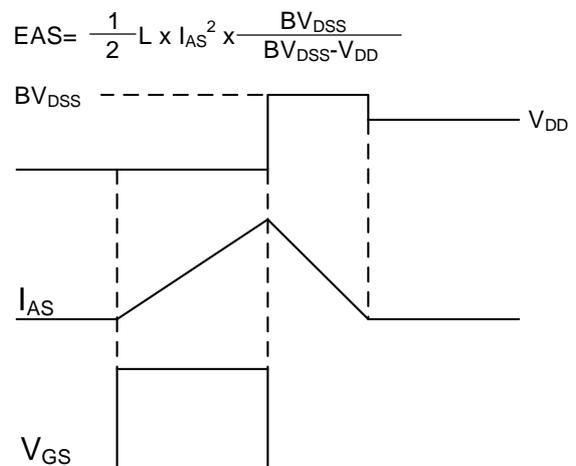


Fig.11 Unclamped Inductive Switching Waveform



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