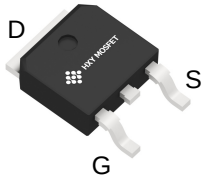
PHD97NQ03LT

N-Channel Enhancement Mode MOSFET

Description

The PHD97NQ03LT uses advanced trench technology to provide excellent RDS(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.

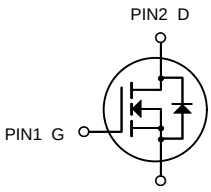


TO-252-2L (DPAK)

General Features

V_{DS}= 30V I_D=80A

$R_{DS(ON)}$< 6.8mΩ@ V_{GS}=10V



N-Channel MOSFET

Application

Battery protection

Load switch

Uninterruptible power supply

Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
PHD97NQ03LT	TO-252-2L(DPAK)	HXY MOSFET	2500

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current – Continuous (T_C=25℃)	80	A
	Drain Current – Continuous (T_C=100℃)	51	A
I_{DM}	Drain Current – Pulsed[1]	320	A
EAS	Single Pulse Avalanche Energy[2]	88	mJ
IAS	Single Pulse Avalanche Current[2]	42	A
P_D	Power Dissipation (T_C=25℃)	54	W
	Power Dissipation – Derate above 25℃	0.43	W/℃
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta JA}$	Thermal Resistance Junction to ambient	62	℃/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	2.3	℃/W

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	30	---	---	V
△BVDSS/△TJ	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	0.04	---	V/℃
IDSS	Drain-Source Leakage Current	V_{DS}=30V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=24V , V_{GS}=0V , T_J=125℃	---	---	10	uA
IGSS	Gate-Source Leakage Current	$V_{GS=}$±20V , V_{DS}=0V	---	---	±100	nA
RDS(ON)	Static Drain-Source On-Resistance[3]	V_{GS}=10V , I_D=20A	---	5	6.8	mΩ
		V_{GS}=4.5V , I_D=10A	---	6.5	9	mΩ
VGS(th)	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1	1.6	2.5	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-4	---	mV/℃
gfs	Forward Transconductance	V_{DS}=10V , I_D=10A	---	18	---	S
Q_g	Total Gate Charge[3,4]	V_{DS}=15V , V_{GS}=4.5V , I_D=20A	---	11.1	---	nC
Qgs	Gate-Source Charge[3,4]		---	1.85	---	
Qgd	Gate-Drain Charge[3,4]		---	6.8	---	
Td(on)	Turn-On Delay Time[3,4]	V_{DD}=15V , V_{GS}=10V , R_G=3.3Ω I_D=15A	---	7.5	---	ns
T_r	Rise Time[3,4]		---	14.5	---	
Td(off)	Turn-Off Delay Time[3,4]		---	35.2	---	
T_f	Fall Time[3,4]		---	9.6	---	
Ciss	Input Capacitance	V_{DS}=25V , V_{GS}=0V , F=1MHz	---	1160	---	pF
Coss	Output Capacitance	V_{GS}=0V, V_{DS}=0V, F=1MHz	---	200	---	Ω
Crss	Reverse Transfer Capacitance		---	180	---	
R_g	Gate resistance		---	2.5	---	
EAS	Single Pulse Avalanche Energy	V_{DD}=25V, L=0.1mH, IAS=20A	20	---	---	mJ
IS	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	80	A
ISM	Pulsed Source Current[3]		---	---	320	A
VSD	Diode Forward Voltage[3]	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1	V
trr	Reverse Recovery Time	VGS=0V,IS=1A , di/dt=100A/μs T_J=25℃	---	---	---	ns
Q_{rr}	Reverse Recovery Charge		---	---	---	nC

Typical Characteristics

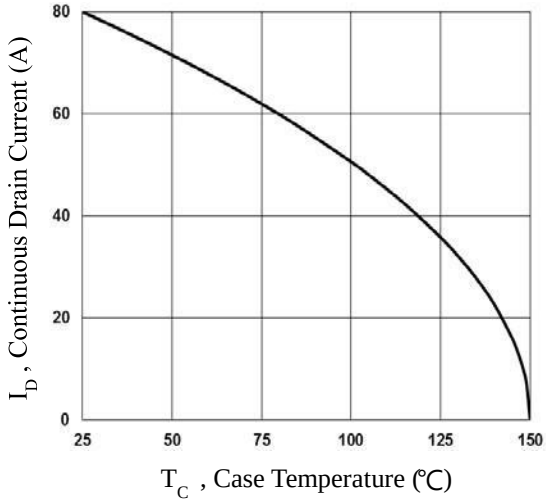


Fig.1 Continuous Drain Current vs. Tc

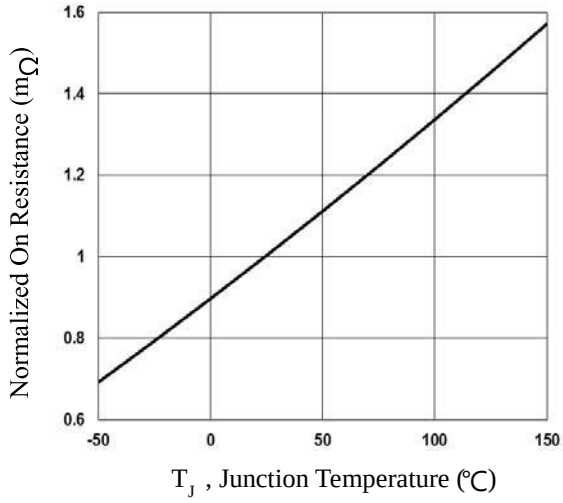


Fig.2 Normalized RDSON vs. Tj

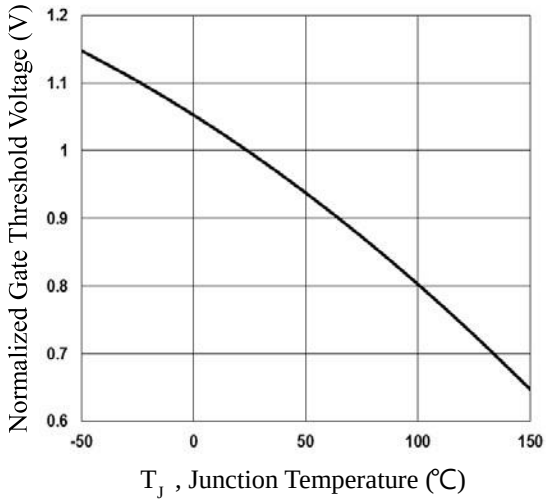


Fig. 3 Normalized Vth vs. Tj_J

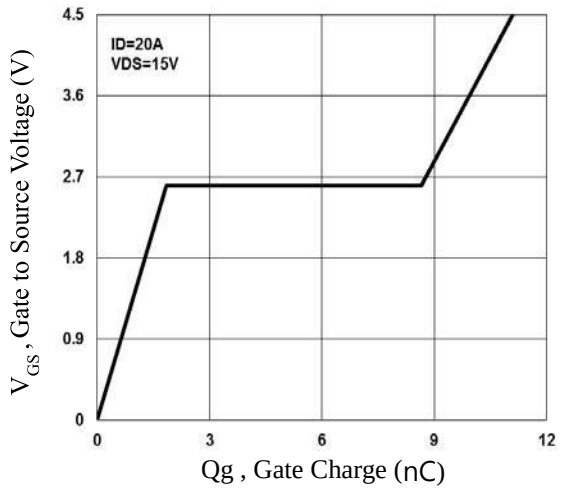


Fig. 4 Gate Charge Waveform

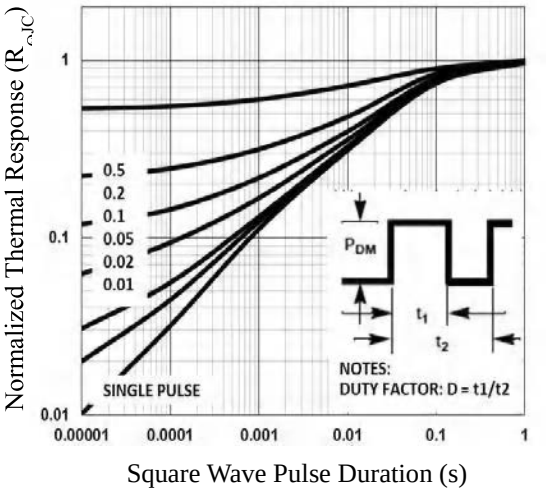


Fig.5 Normalized Transient Impedance

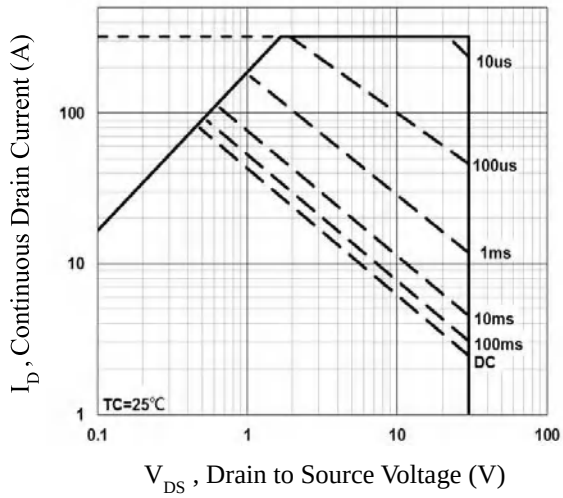


Fig.6 Maximum Safe Operation Area

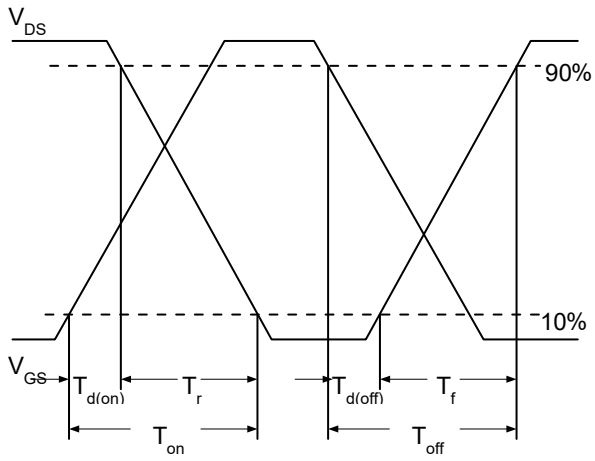


Fig. 7 Switching Time Waveform

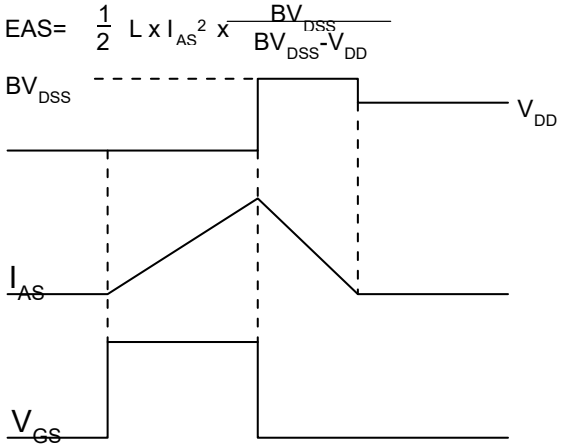
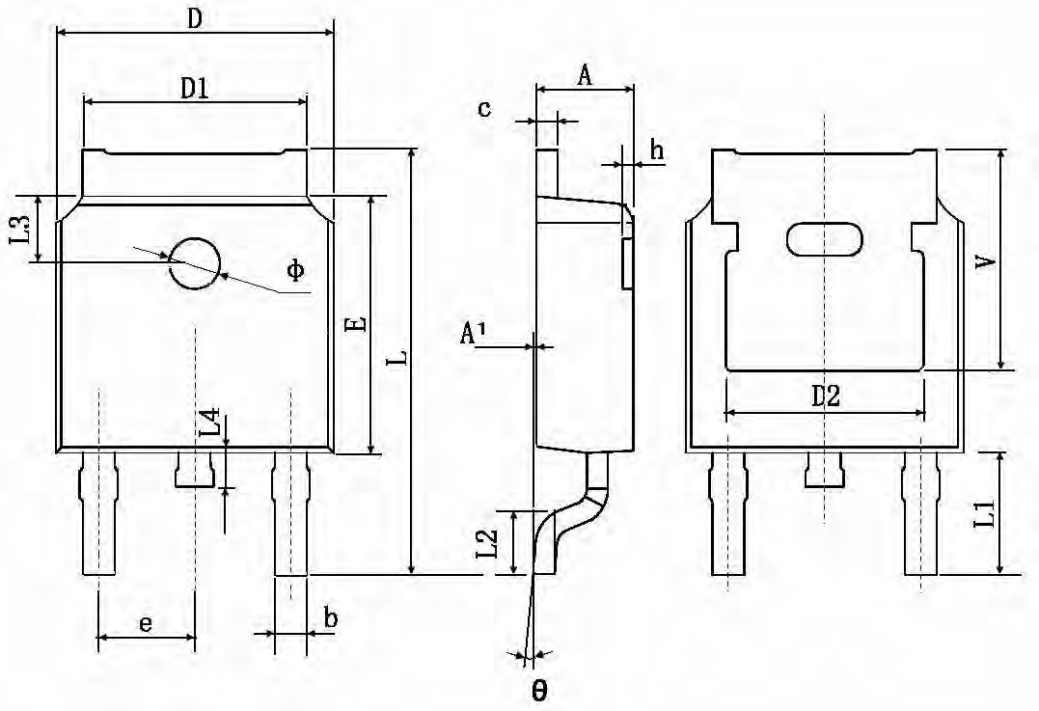


Fig. 8 EAS Wavefo rm

TO-252-2L(DPAK) Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	0.483 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	

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