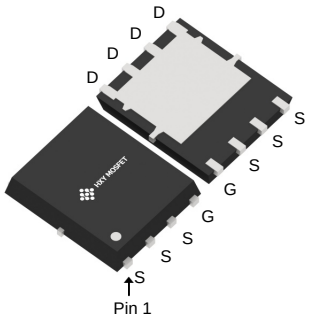
# NTMFS4C810NAT3G

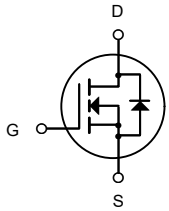
N-Channel Enhancement Mode MOSFET

## Description

The NTMFS4C810NAT3G 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
(DFN-8(5x6))




N-Channel MOSFET

## General Features

$V_{DS}$ = 30V $I_D$ = 80A

$R_{DS(ON)}$ < 6mΩ $V_{GS}$=10V

## Application

Battery protection

Load switch

Uninterruptible power supply

## Package Marking and Ordering Information

| Product ID | Pack | Brand | Qty(PCS) |
|---|---|---|---|
| NTMFS4C810NAT3G | DFN5X6-8L(DFN-8(5x6)) | HXY MOSFET | 5000 |

## Absolute Maximum Ratings ($T_C$=25°C unless otherwise noted)

| Symbol | Parameter | Rating | Units |
|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | 30 | V |
| $V_{GS}$ | Gate-Source Voltage | ±20 | V |
| $I_D$@$T_C$=25℃ | Continuous Drain Current, $V_{GS}$ @ 10V | 80 | A |
| $I_D$@$T_C$=70℃ | Continuous Drain Current, $V_{GS}$ @ 10V | 45 | A |
| $I_{DM}$ | Pulsed Drain Current[2] | 280 | A |
| EAS | Single Pulse Avalanche Energy[3] | 56 | mJ |
| $P_D$@$T_C$=25℃ | Total Power Dissipation[4] | 37 | 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] | 30 | ℃/W |

## Electrical Characteristics ($T_C$=25°C Unless Otherwise Noted)

| Symbol | Parameter | Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **Static Electrical Characteristics @ $T_j$=25°C (unless otherwise stated)** | | | | | | |
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V $I_D$=250μA | 30 | -- | -- | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$=30V,$V_{GS}$=0V | -- | -- | 0.1 | μA |
| | Zero Gate Voltage Drain Current($T_j$=125°C) | $V_{DS}$=30V,$V_{GS}$=0V | -- | -- | 100 | μA |
| $I_{GSS}$ | Gate-Body Leakage Current | $V_{GS}$=±20V,$V_{DS}$=0V | -- | -- | ±100 | nA |
| $V_{GS(TH)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$,$I_D$=250μA | 1.0 | 1.7 | 2.5 | V |
| $R_{DS(ON)}$ | Drain-Source On-State Resistance③ | $V_{GS}$=10V, $I_D$=20A | -- | 4.7 | 6 | mΩ |
| $R_{DS(ON)}$ | Drain-Source On-State Resistance③ | $V_{GS}$=4.5V, $I_D$=16A | -- | 5.4 | 8 | mΩ |
| **Dynamic Electrical Characteristics @ $T_j$ = 25°C (unless otherwise stated)** | | | | | | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=15V,$V_{GS}$=0V, f=1MHz | -- | 1930 | -- | pF |
| $C_{oss}$ | Output Capacitance | | -- | 310 | -- | pF |
| $C_{rss}$ | Reverse Transfer Capacitance | | -- | 260 | -- | pF |
| $R_g$ | Gate Resistance | f=1MHz | -- | 0.85 | -- | |
| $Q_g$ | Total Gate Charge | $V_{DS}$=15V,$I_D$=20A, $V_{GS}$=10V | -- | 38 | -- | nC |
| $Q_{gs}$ | Gate-Source Charge | | -- | 5.1 | -- | nC |
| $Q_{gd}$ | Gate-Drain Charge | | -- | 12 | -- | nC |
| **Switching Characteristics** | | | | | | |
| $t_{d(on)}$ | Turn-on Delay Time | $V_{DD}$=15V, $I_D$=20A, $R_G$=3, $V_{GS}$=10V | -- | 8.5 | -- | nS |
| $t_r$ | Turn-on Rise Time | | -- | 9 | -- | nS |
| $t_{d(off)}$ | Turn-Off Delay Time | | -- | 31 | -- | nS |
| $t_f$ | Turn-Off Fall Time | | -- | 9 | -- | nS |
| **Source- Drain Diode Characteristics@ $T_j$ = 25°C (unless otherwise stated)** | | | | | | |
| $V_{SD}$ | Forward on voltage | $I_{SD}$=20A,$V_{GS}$=0V | -- | 0.8 | 1.2 | V |
| $t_{rr}$ | Reverse Recovery Time | $T_j$=25°C,$I_{sd}$=20A, $V_{GS}$=0V di/dt=500A/μs | -- | 16 | -- | nS |
| $Q_{rr}$ | Reverse Recovery Charge | | | 42 | | nC |

NOTE:

① Repetitive rating; pulse width limited by max. junction temperature.

② Limited by $T_{Jmax}$, starting $T_J$ = 25°C, L = 0.5mH,$R_G$ = 25 , $I_{AS}$ = 15A, $V_{GS}$ =10V. Part not recommended for use above this value

③ Pulse width ≤ 300μs; duty cycle≤ 2%.

## Typical Characteristics

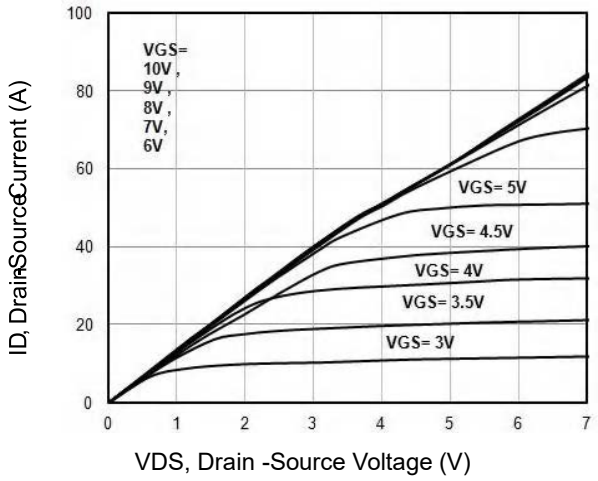



**Fig1.** Typical Output Characteristics

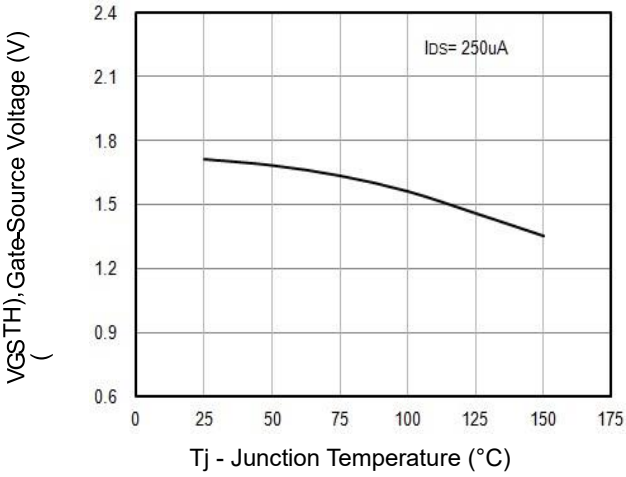



**Fig2.** $V_{GS(TH)}$ Gate -Source Voltage Vs.Tj

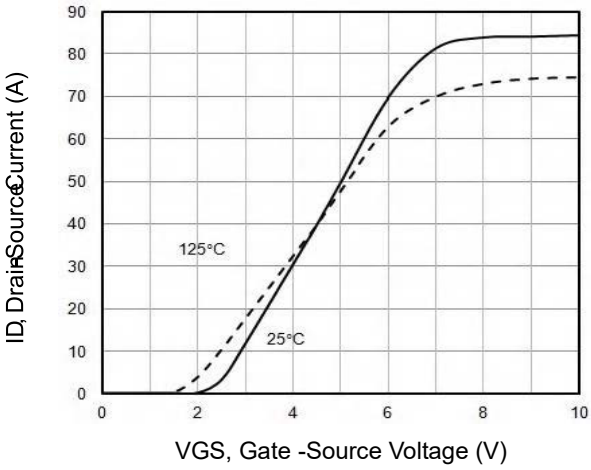



**Fig3.** Typical Transfer Characteristics

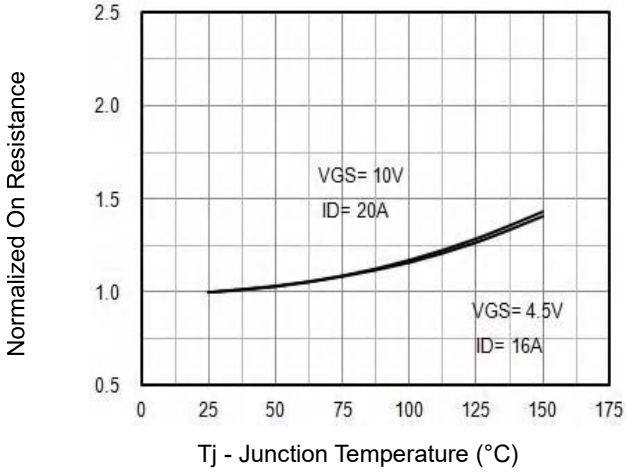



**Fig4.** Normalized On-Resistance Vs. Tj

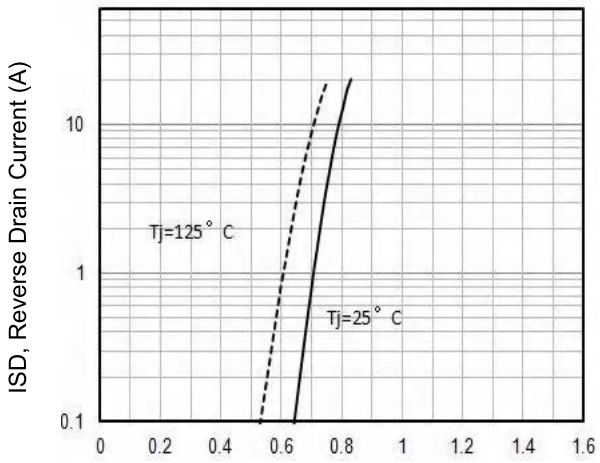



**Fig6.** Maximum Safe Operating Area
Voltage

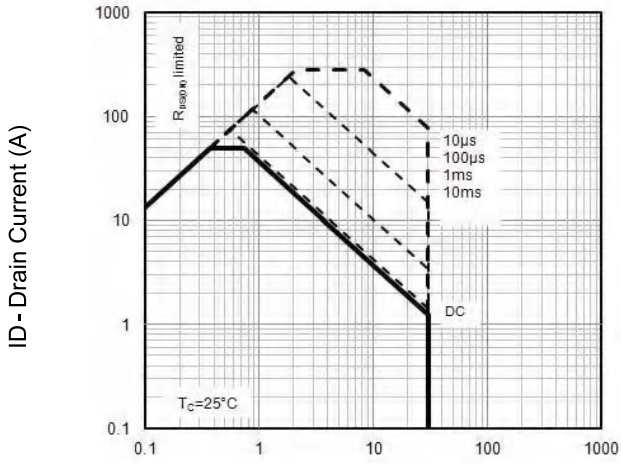



**Fig5.** Typical Source-Drain Diode Forward

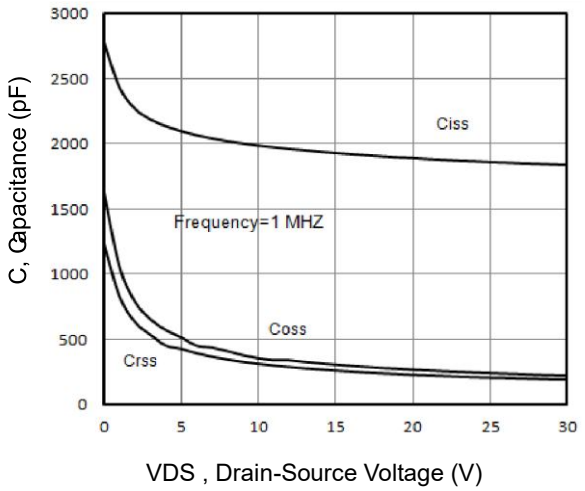



**Fig7.** Typical Capacitance Vs.Drain-Source Voltage

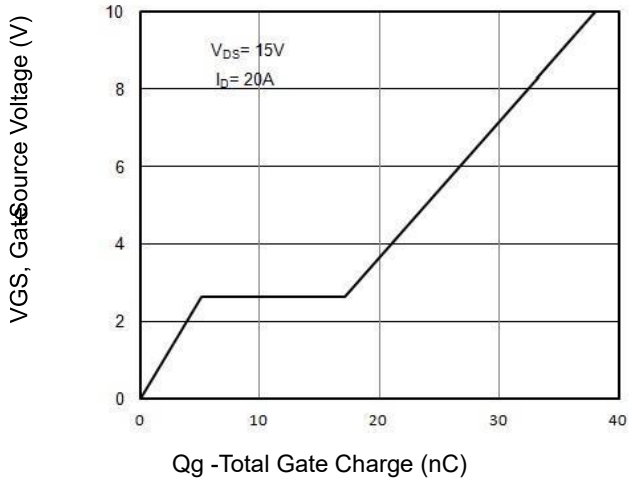



**Fig8.** Typical Gate Charge Vs.Gate-Source Voltage

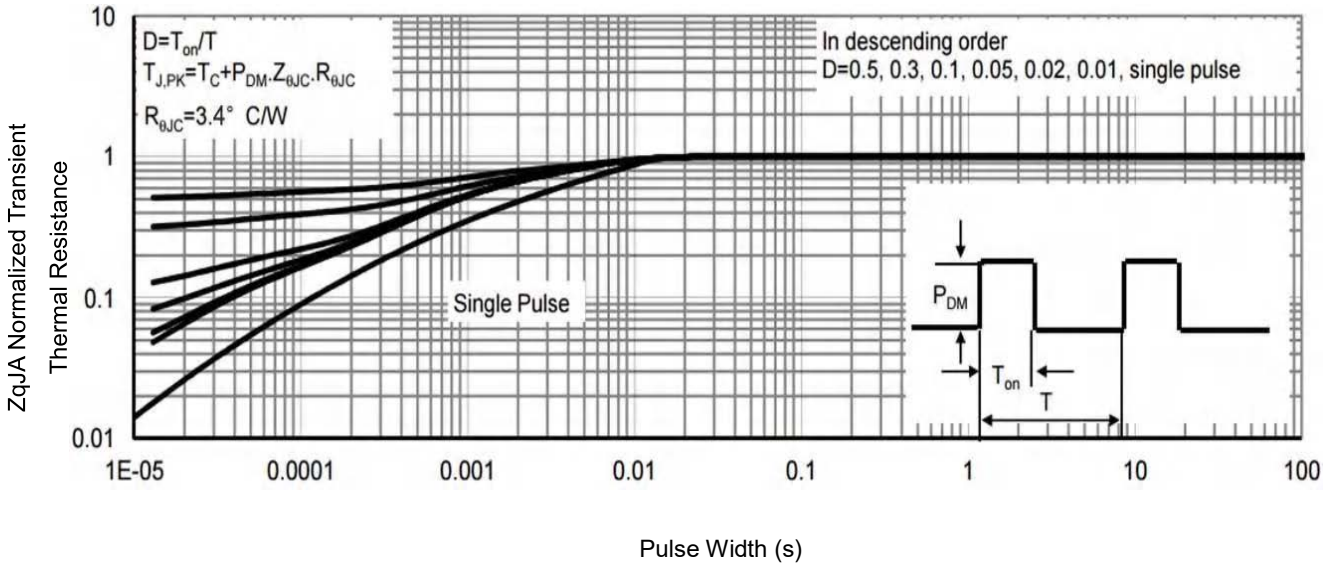



**Fig9.** Normalized Maximum Transient Thermal Impedance

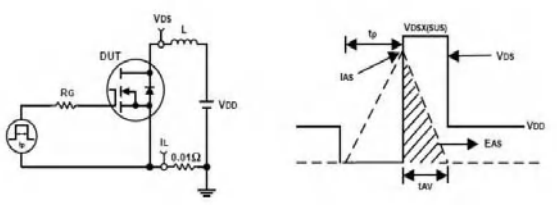



**Fig10.** Unclamped Inductive Test Circuit and waveforms

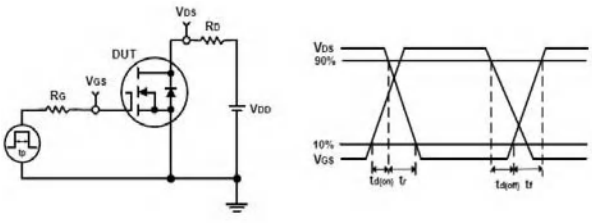
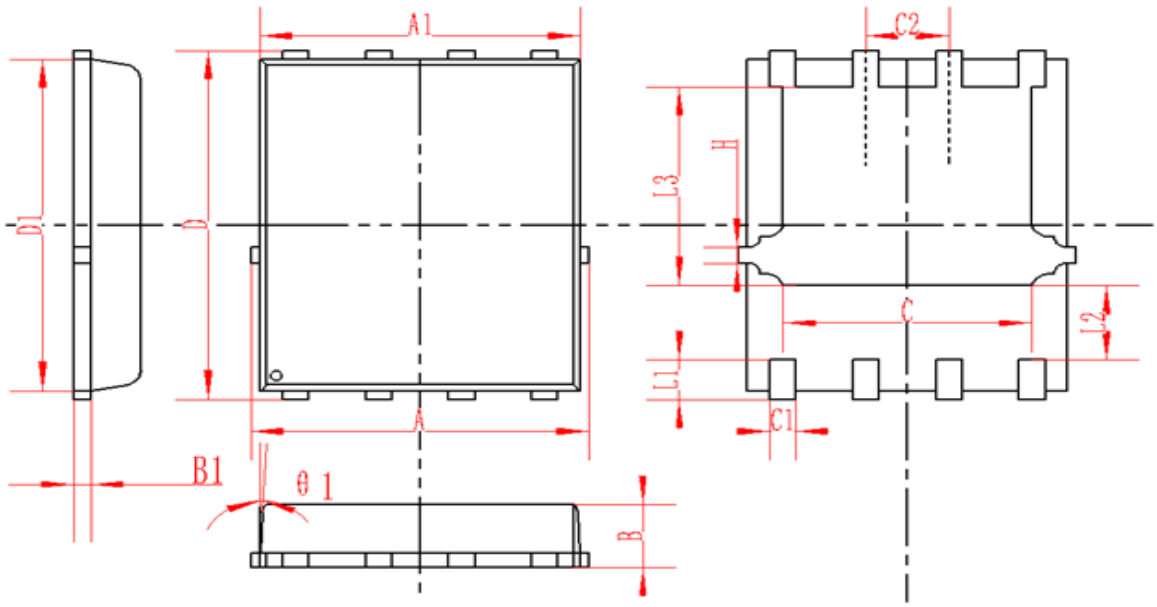



**Fig11.** Switching Time Test Circuit and waveforms

## DFN5X6-8L(DFN-8(5x6)) 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 |

## Attention

■ Any and all HUA XUAN YANG ELECTRONICS products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your HUA XUAN YANG ELECTRONICS representative nearest you before using any HUA XUAN YANG ELECTRONICS products described or contained herein in such applications.

■ HUA XUAN YANG ELECTRONICS assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all HUA XUAN YANG ELECTRONICS products described or contained herein.

■ Specifications of any and all HUA XUAN YANG ELECTRONICS products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer’s products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer’s products or equipment.

■ HUA XUAN YANG ELECTRONICS CO.,LTD. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could
give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.

■ In the event that any or all HUA XUAN YANG ELECTRONICS products(including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.

■ No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of HUA XUAN YANG ELECTRONICS CO.,LTD.

■ Information (including circuit diagrams and circuit parameters) herein is for example only ; it is not guaranteed for volume production. HUA XUAN YANG ELECTRONICS believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.

■ Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the HUA XUAN YANG ELECTRONICS product that you intend to use.

# Unikeyic Electronics

Global Electronic Components Distributor

Click to view pricing, inventory, delivery, and lifecycle information:

## HXY MOSFET:

HOPA2340UA SS5150B HMCP602-I/SN HT7150 HXY2101EI SS1045 HESDNC5VB1AF-B HXY2300MI
IRLML6246PBF HC4D20120A MAX487ESA SQJA04EP-T1_BE3 SS10100 BZT52C13 HAD8542ARZ
SS510C TPSMB28A-VR BZT52C3V3S DTC143ZE HC3D10170A PESD5V0S1BB TPSMB100CA-VR
US2M MMBT3904T P6SMB200A P6SMB33CA P6SMB36CA SD15C HT7540-1 HXY8205ES