

100 V N-channel power MOSFET products for industrial equipment, featuring industry's lowest level On-resistance

“TPH3R70APL” and “TPN1200APL” are new low voltage N-channel power MOSFET products (U-MOSIX-H series); these 100 V products suitable for power supplies for industrial equipment.

Fabricated with the company's latest low voltage U-MOSIX-H trench process, which optimizes the device structure, the TPH3R70APL and TPN1200APL deliver the industry's lowest level On-resistance^[1]. In addition, compared with the current devices using the U-MOSVIII-H

process, the new devices have lower On-resistance x output charge and On-resistance x gate switch charge key figures of merit for MOSFETs for switching applications^[2].

Toshiba Electronic Devices & Storage Corporation will continue to expand its MOSFET portfolio with market trends in order to help improve the power supply efficiency.



Features

- Industry's lowest level On-resistance^[1]
 $R_{DS(ON)}=3.7 \text{ m}\Omega \text{ (max) @}V_{GS}=10 \text{ V (TPH3R70APL)}$
 $R_{DS(ON)}=11.5 \text{ m}\Omega \text{ (max) @}V_{GS}=10 \text{ V (TPN1200APL)}$
- Low output charge and low gate switch charge
- Allows 4.5V logic level drive

Applications

- Power supplies for industrial equipment
- Motor control equipment



Power supplies

Product Specifications

(Unless otherwise specified, @T_a=25°C)

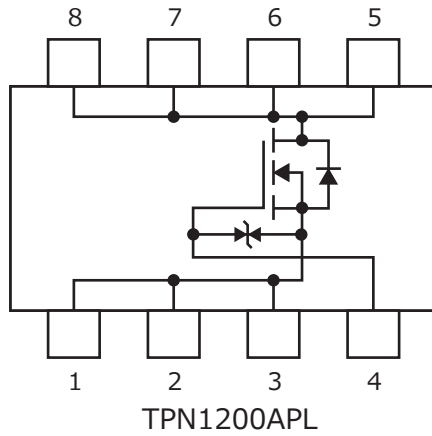
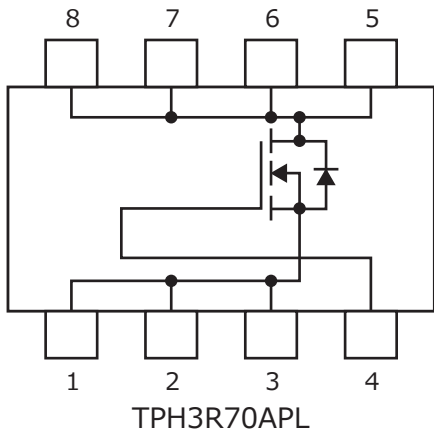
| Part number | Absolute maximum ratings | | Drain-source On-resistance R _{DS(ON)} max (mΩ) | | Total gate charge Q _g typ. (nC) | Gate switch charge Q _{sw} typ. (nC) | Output charge Q _{oss} typ. (nC) | Input capacitance C _{iss} typ. (pF) | Package |
|-------------|----------------------------------------------|----------------------------------------------------------------|------------------------------------------------------------|-------------------------|-----------------------------------------------|-------------------------------------------------|---------------------------------------------|-------------------------------------------------|--------------|
| | Drain-source voltage V _{DSS} (V) | Drain current (DC) I _D @T _c =25°C (A) | @V _{GS} =10 V | @V _{GS} =4.5 V | | | | | |
| | | | TPH3R70APL | 100 | | | | | |
| TPN1200APL | 40 | 11.5 | 20 | | 24 | 7.5 | 24 | 1425 | TSON Advance |

Notes:

[1] As of November, 2017 for MOSFETs with equivalent ratings. Toshiba Electronic Devices & Storage Corporation survey.

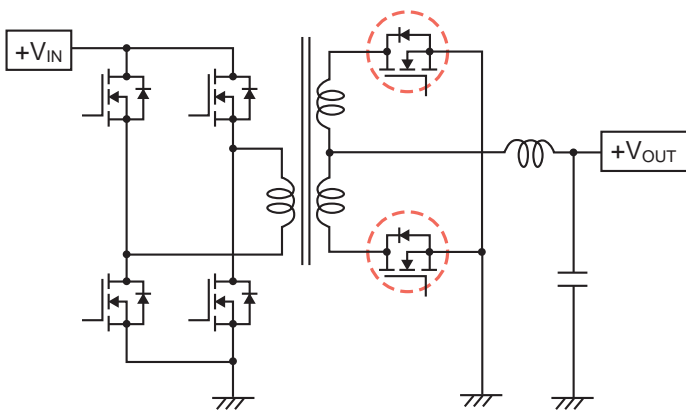
[2] For TPH3R70APL, its On-resistance x output charge has been reduced by 10 %, and On-resistance x gate switch charge has been reduced by 10 %, compared with TPH4R10ANL (U-MOSVIII-H).

Internal Circuit

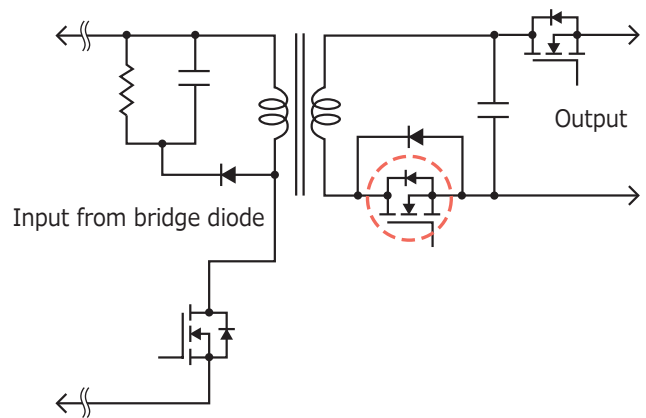


1, 2, 3: Source
4: Gate
5, 6, 7, 8: Drain

Application Circuit Example



Power supplies (Full bridge converter)



Power supplies (Flyback circuit)

The application circuits shown in this document are provided for reference purposes only. Thorough evaluation is required, especially at the mass-production design stage. Toshiba Electronic Devices & Storage Corporation does not grant any license to any industrial property rights by providing these examples of application circuits.

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