

Lineup expansion of 100 V N-channel power MOSFET U-MOSIX-H series that helps to improve the efficiency of power supplies for industrial equipment

“TPW3R70APL” and “TPH5R60APL” are new products in the 100 V N-channel power MOSFET U-MOSIX-H series, suitable for power supplies for industrial equipment.

The new products use surface mount packages: DSOP Advance^[1] and SOP Advance, expanding the lineup. By using the latest generation process U-MOSIX-H with a low voltage trench structure, they feature industry’s lowest level^[2] On-resistance and have improved the tradeoff between the On-resistance and output charge^[3]. In addition, they have inherited the low gate switch charge characteristics from the existing generation process U-MOSVIII-H, reducing the product of On-resistance and gate switch charge^[4], a performance requirement index in switching applications.



Features

- Industry’s lowest level On-resistance^[2]
 $R_{DS(ON)}=3.7 \text{ m}\Omega$ (max) @ $V_{GS}=10 \text{ V}$ (TPW3R70APL)
 $R_{DS(ON)}=5.6 \text{ m}\Omega$ (max) @ $V_{GS}=10 \text{ V}$ (TPH5R60APL)
- Low output charge and low gate switch charge
- Allows 4.5 V logic level drive

Applications

- Power supplies for industrial equipment
(Efficient DC-DC converters, efficient AC-DC converters, switching power supplies, etc.)
- Motor control equipment (Motor drives, etc.)



Power supplies

Product Specifications

(Unless otherwise specified, @ $T_a=25^\circ\text{C}$)

Part number	Absolute maximum ratings		Drain-source On-resistance $R_{DS(ON)}$ max (m Ω)		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 @ $T_c=25^\circ\text{C}$ (A)	@ $V_{GS}=10 \text{ V}$	@ $V_{GS}=4.5 \text{ V}$					
			TPW3R70APL	100					
TPH5R60APL	60	5.6	9.5		52	14	46	3300	SOP Advance

Notes:

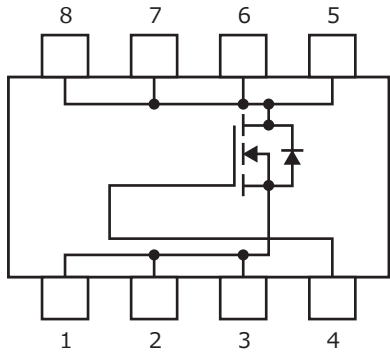
[1] Both sided cooling package

[2] As of December 2017, from a survey by Toshiba Electronic Devices & Storage Corporation.

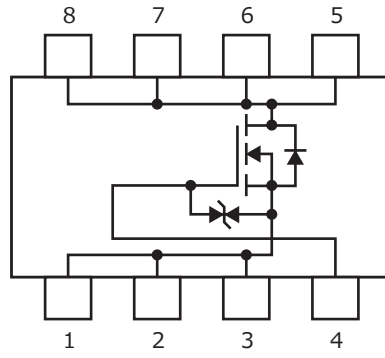
[3] TPW3R70APL has improved its product of On-resistance (typ.) and output charge (typ.) by about 18 % compared with TPW4R50ANH (U-MOSVIII-H).

[4] TPW3R70APL has reduced its product of On-resistance (typ.) and gate switch charge (typ.) by about 20 % compared with TPW4R50ANH (U-MOSVIII-H).

Internal Circuit



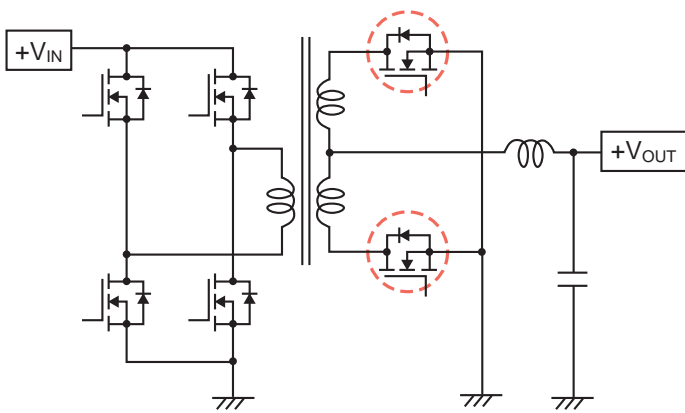
TPW3R70APL



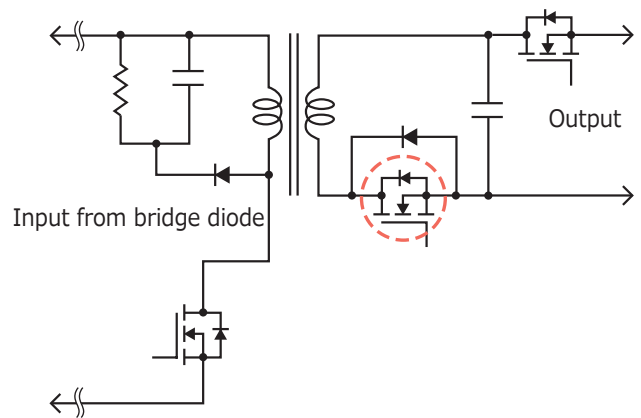
TPH5R60APL

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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