

## 40 V N-channel power MOSFETs in the U-MOSIX-H series using the SOP Advance(WF) package for automotive applications

“TPHR7904PB” and “TPH1R104PB” are new 40 V N-channel power MOSFET products for automotive applications using the small, low-resistance SOP Advance(WF) package.

By mounting our U-MOSIX-H series chip having the latest trench structure on the small, low-resistance SOP Advance(WF) package, the new products feature low On-resistance characteristics, which can reduce conduction loss. The U-MOSIX-H series also lowers switching noise compared with Toshiba Electronic Devices & Storage Corporation’s previous series (U-MOSIV), contributing to reduce EMI<sup>[1]</sup>.

The SOP Advance(WF) package uses a wettable flank terminal structure<sup>[2]</sup>.



### Features

- The SOP Advance(WF) package has made lower On-resistance of the new U-MOSIX-H series products.  
 $R_{DS(ON)}=0.79\text{ m}\Omega$  (max) @ $V_{GS}=10\text{ V}$  (TPHR7904PB)  
 $R_{DS(ON)}=1.14\text{ m}\Omega$  (max) @ $V_{GS}=10\text{ V}$  (TPH1R104PB)
- Low-noise characteristics reduce EMI<sup>[1]</sup>
- The wettable flank terminal structure<sup>[2]</sup> for small and low-resistance package.

### Applications

- Electric power steering (EPS)
- Load switches
- Electric pumps



**Automotive applications**

### Product Specifications

(@ $T_a=25\text{ }^\circ\text{C}$ )

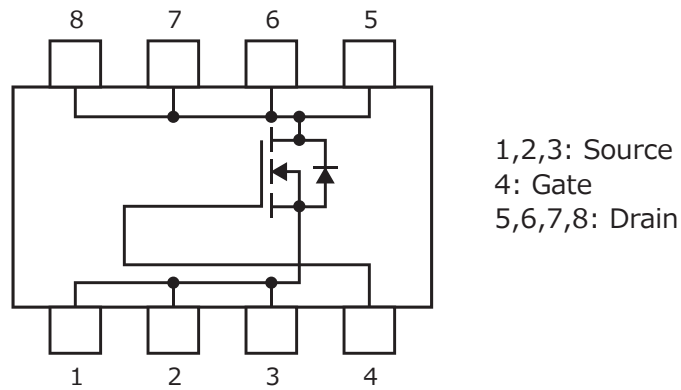
Part number	Absolute maximum ratings		Drain-source On-resistance $R_{DS(ON)}$ max (m $\Omega$ )		Built-in Zener Diode between Gate-Source	Series	Package
	Drain-source voltage $V_{DSS}$ (V)	Drain current (DC) $I_D$ (A)	@ $V_{GS}=6\text{ V}$	@ $V_{GS}=10\text{ V}$			
			TPHR7904PB	40			
TPH1R104PB	120	1.96	1.14				

Notes

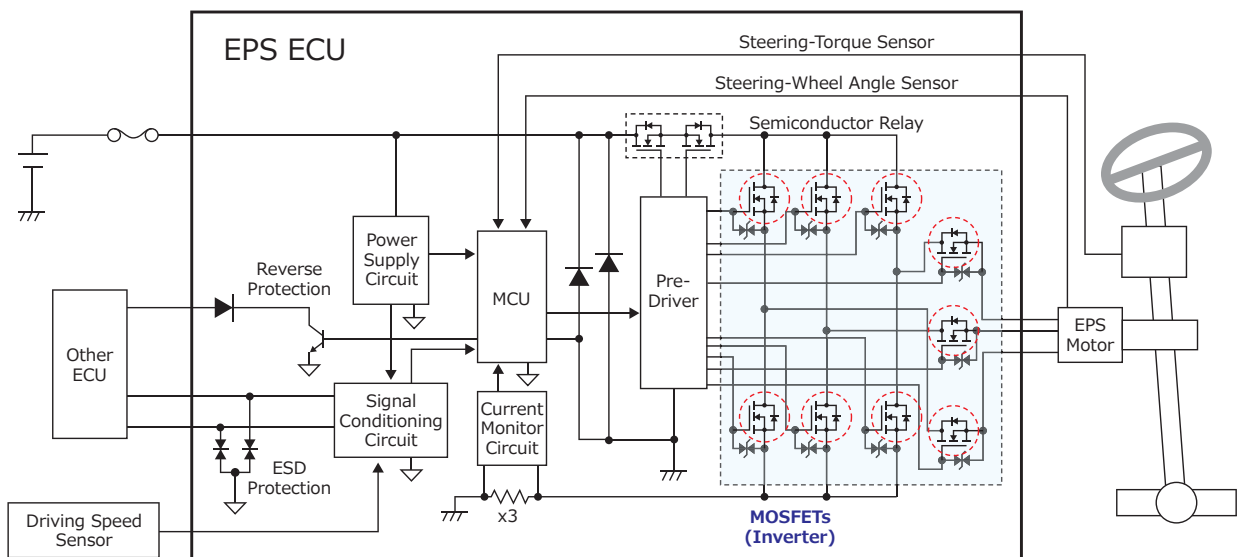
[1] EMI (Electromagnetic interference)

[2] Wettable flank terminal structure: A terminal structure that allows automated optical inspection of installation on boards.

## Internal Circuit



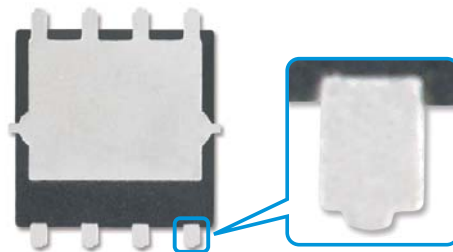
## Application Circuit Example



### Electric power steering (EPS)

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.

## Photomicrograph of a terminal



Wettable flank terminal structure<sup>[2]</sup>

Before creating and producing designs and using, customers must also refer to and comply with the latest versions of all relevant information of this document and the instructions for the application that Product will be used with or for.

## TOSHIBA ELECTRONIC DEVICES & STORAGE CORPORATION