

## Lineup expansion of 100 V N-channel power MOSFET U-MOSIX-H series products that help improve the efficiency of power supplies

The 12 products including “TK2R9E10PL” are new products in the 100 V N-channel power MOSFET U-MOSIX-H series suitable for power supply applications. The new products expanding the lineup are five TO-220 package products, five TO-220SIS package products, and two DPAK package products. By using the latest generation process U-MOSIX-H with a low voltage trench structure, they feature industry’s lowest level<sup>[1]</sup> On-resistance and have improved the tradeoff between the On-resistance and output charge<sup>[2]</sup>. 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<sup>[3]</sup>, a performance requirement index in switching applications.



### Features

- Industry’s lowest level On-resistance<sup>[1]</sup>  $R_{DS(ON)}=2.9 \text{ m}\Omega$  (max) @ $V_{GS}=10 \text{ V}$  (TK2R9E10PL)
- Low output charge and low gate switch charge
- Allows 4.5 V logic level drive

### Applications

- Various types of power supplies (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, @ $T_a=25 \text{ }^\circ\text{C}$ )

Part number	Absolute maximum ratings		Drain-source On-resistance $R_{DS(ON)}$ max (m $\Omega$ )		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) $I_D$ @ $T_c=25 \text{ }^\circ\text{C}$ (A)							
			@ $V_{GS}=10 \text{ V}$	@ $V_{GS}=4.5 \text{ V}$					
TK2R9E10PL	100	100	2.9	4.1	161	48	164	9500	TO-220
TK3R9E10PL		100	3.9	5.8	96	26	99	6320	
TK6R4E10PL		70	6.4	9.7	58	17	58	3455	
TK7R2E10PL		60	7.2	11	44	13	47	2800	
TK110E10PL		42	10.7	16	33	9.3	32	2040	
TK3R2A10PL		100	3.2	4.3	161	48	164	9500	TO-220SIS
TK4R1A10PL		80	4.1	5.9	104	29	99	6320	
TK6R7A10PL		56	6.7	10.1	58	17	58	3455	
TK7R4A10PL		50	7.4	11.2	44	13	47	2800	
TK110A10PL		36	10.8	16	33	9.3	32	2040	
TK7R7P10PL		55	7.7	11.5	44	13	47	2800	DPAK
TK110P10PL		40	10.6	16	33	9.3	32	2040	

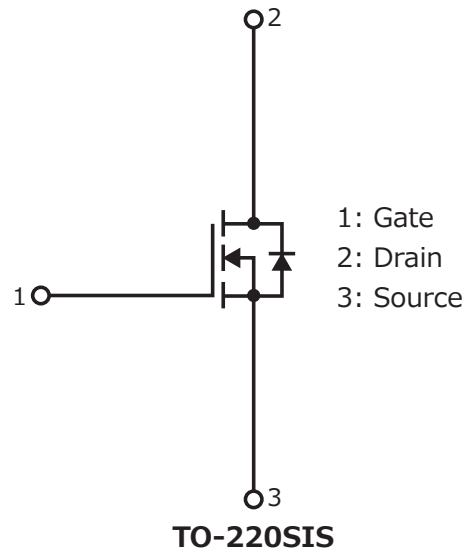
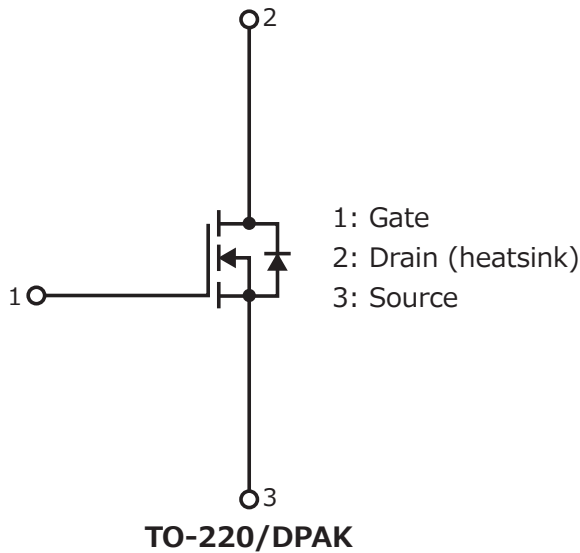
Notes:

[1] As of January 2018, from a survey by Toshiba Electronic Devices & Storage Corporation.

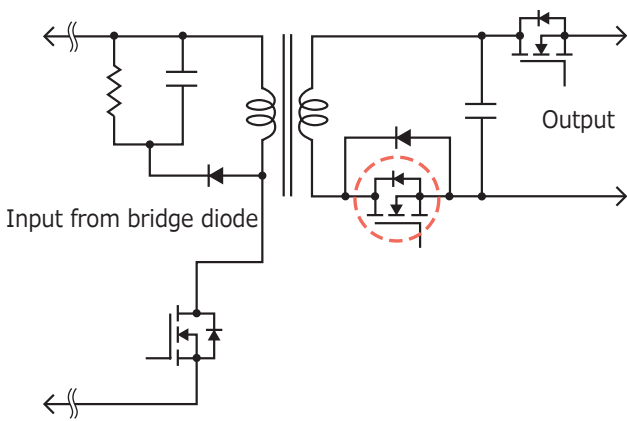
[2] TK2R9E10PL has improved its product of On-resistance (typ.) and output charge (typ.) by about 18 % compared with TK100E10N1 (U-MOSVIII-H).

[3] TK2R9E10PL has improved its product of On-resistance (typ.) and gate switch charge (typ.) by about 25 % compared with TK100E10N1 (U-MOSVIII-H).

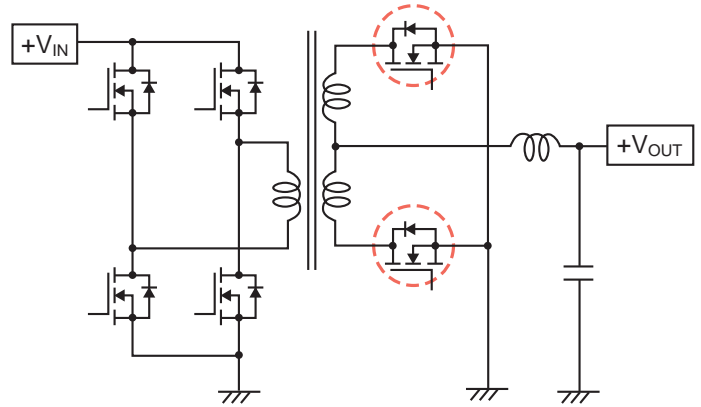
# Internal Circuit



# Application Circuit Example



**Power supplies (Flyback converter)**



**Power supplies (Full bridge converter)**

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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