

Automotive use N-ch power MOSFET, 100 V product (U-MOSVIII-H series)

TK60S10N1L, TK60R10N1L, TK60F10N1L

Industry-leading low On-resistance and narrow gate threshold voltage range

Toshiba has launched three 100 V N-ch power MOSFETs: “TK60S10N1L”, “TK60R10N1L” and “TK60F10N1L” for automotive applications.

These products feature industry-leading low On-resistance^{*1} with proprietary technology using Cu connector. In addition, their narrowed gate threshold voltage range of 2.5 to 3.5 V reduces tolerance of switching time.

Applications

Automotive equipment

- DC-DC converters
- Motor drives
- Power supplies



Automotive applications

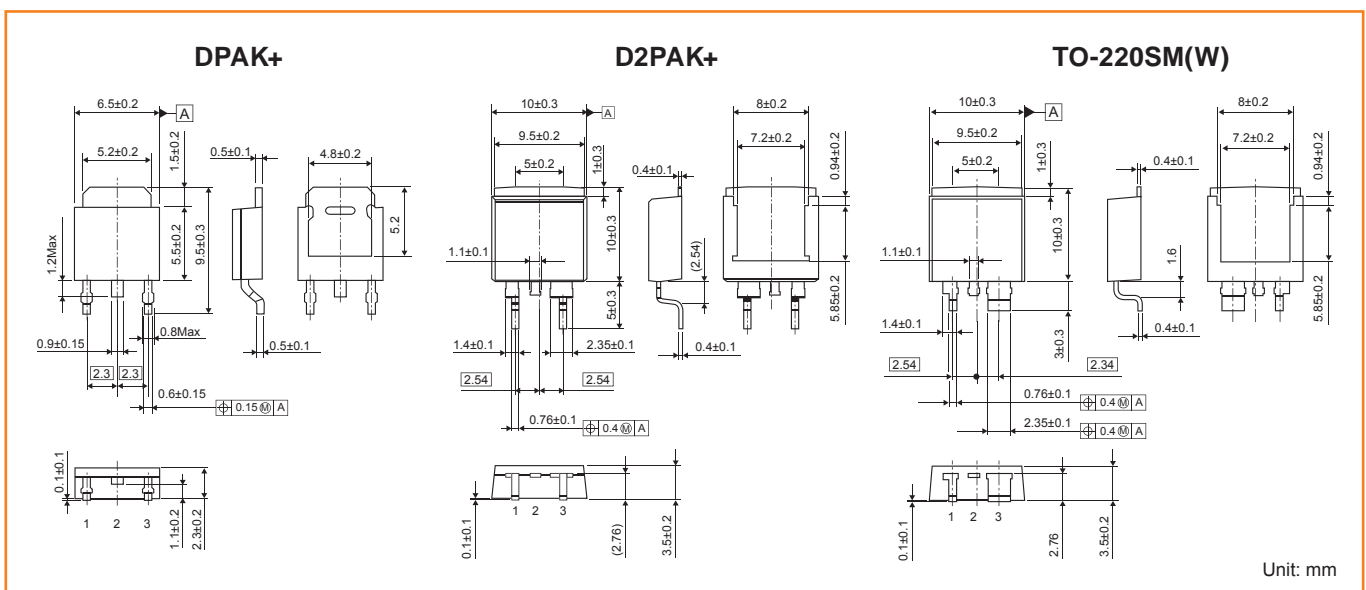
Features

- Industry-leading low On-resistance^{*1}:
 $R_{DS(ON)}=6.11 \text{ m}\Omega$ (max) @ $V_{GS}=10 \text{ V}$ (TK60S10N1L/TK60F10N1L)
 $R_{DS(ON)}=6.31 \text{ m}\Omega$ (max) @ $V_{GS}=10 \text{ V}$ (TK60R10N1L)
- Narrow gate threshold voltage range:
 $V_{th}=2.5$ to 3.5 V (narrow: 1 V range)
- Low thermal resistance
 $R_{th(ch-c)}=0.83^\circ\text{C/W}$ (max) (TK60S10N1L)
 $R_{th(ch-c)}=0.73^\circ\text{C/W}$ (max) (TK60F10N1L/TK60R10N1L)
- Channel temperature rating: $T_{ch}=175^\circ\text{C}$
- Low switching noise

External View



Outline Drawing



*1: Comparison with the product of the same maximum rating, according to a survey by Toshiba (as of March 2017).

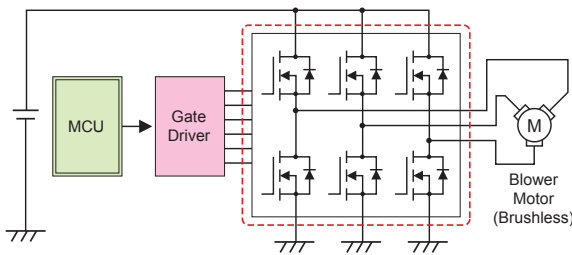
Main Specifications

(@T_a=25°C)

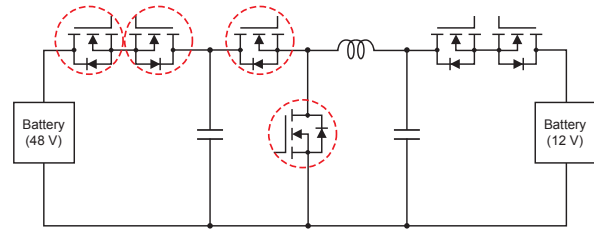
Polarity	Part number	Absolute maximum ratings				Drain-source On-resistance R _{DS(ON)} max (mΩ)		Gate threshold voltage V _{th} (V)	Channel-to-case thermal resistance R _{th(ch-c)} max (°C/W)	Package	Series
		Drain-source voltage V _{DSS} (V)	Drain current (DC) I _D (A)	Drain current (pulsed) I _{DP} (A)	Channel temperature T _{ch} (°C)	@V _{GS} =6 V	@V _{GS} =10 V				
N-ch	TK60S10N1L	100	60	180	175	9.25	6.11	2.5 to 3.5	0.83	DPAK+	U-MOSVIII-H
	TK60R10N1L					9.55	6.31		0.73	D2PAK+	
	TK60F10N1L					9.25	6.11		0.73	TO-220SM(W)	

Circuit Example

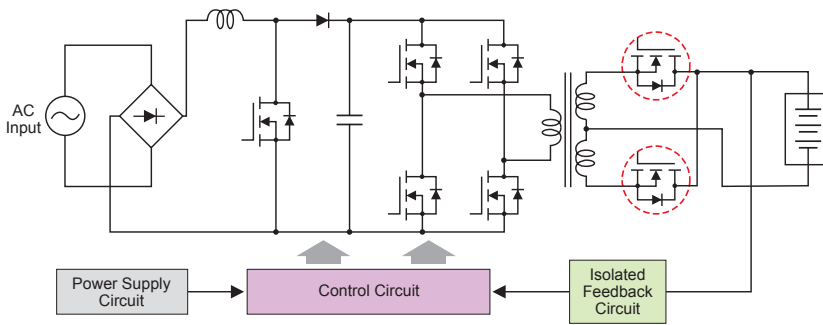
■ Motors for 48 V battery



■ DC-DC converters (Bidirectional)



■ Power supplies



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