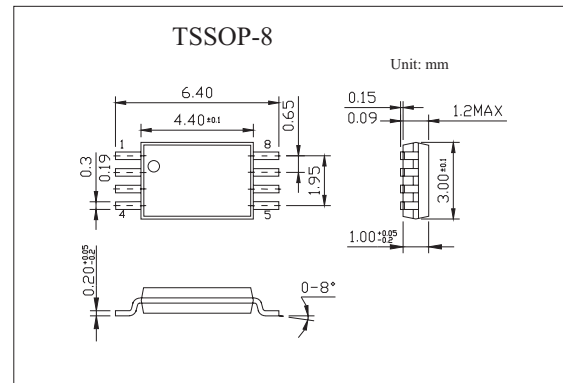
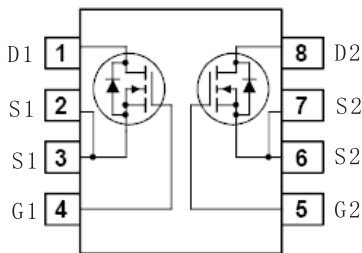


Dual N-Channel 2.5V Specified PowerTrench MOSFET

KDW2503N

■ Features

- 5.5 A, 20 V. $R_{DS(ON)} = 0.021 \Omega$ @ $V_{GS} = 4.5 \text{ V}$
 $R_{DS(ON)} = 0.035 \Omega$ @ $V_{GS} = 2.5 \text{ V}$
- Fast switching speed
- High performance trench technology for extremely low $R_{DS(ON)}$
- Extended V_{GSS} range ($\pm 12 \text{ V}$) for battery applications

■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Drain to Source Voltage	V_{DS}	20	V
Gate to Source Voltage	V_{GS}	± 12	V
Drain Current Continuous (Note 1a)	I_D	5.5	A
Drain Current Pulsed		30	A
Power Dissipation for Single Operation (Note 1a)	P_D	1	W
Power Dissipation for Single Operation (Note 1b)		0.6	
Operating and Storage Temperature	T_J, T_{STG}	-55 to 175	$^\circ\text{C}$
Thermal Resistance Junction to Ambient (Note 1a)	$R_{\theta JA}$	125	$^\circ\text{C}/\text{W}$
Thermal Resistance Junction to Ambient (Note 1b)	$R_{\theta JA}$	208	$^\circ\text{C}/\text{W}$

KDW2503N

■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Testconditons	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BVDSS	V _{GS} = 0 V, I _D = 250 μA	20			V
Breakdown Voltage Temperature Coefficient	$\frac{\Delta BVDSS}{\Delta T_J}$	I _D = 250 μA, Referenced to 25°C		14		mV/°C
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 16 V, V _{GS} = 0 V			1	μA
Gate-Body Leakage, Forward	I _{GSSF}	V _{GS} = 12 V, V _{DS} = 0 V			100	nA
Gate-Body Leakage, Reverse	I _{GSSR}	V _{GS} = -12 V, V _{DS} = 0 V			-100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	0.6	0.8	1.5	V
Gate Threshold Voltage Temperature Coefficient	$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	I _D = 250 μA, Referenced to 25°C		-3.2		mV/°C
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = 4.5 V, I _D = 5.5 A		17	21	mΩ
		V _{GS} = 2.5 V, I _D = 4.2 A		24	35	
		V _{GS} = 4.5 V, I _D = 5.5 A, T _J = 125°C		23	34	
On-State Drain Current	I _{D(on)}	V _{GS} = 4.5 V, V _{DS} = 5V	30			A
Forward Transconductance	g _{FS}	V _{DS} = 5 V, I _D = 5.5A		26		S
Input Capacitance	C _{iss}	V _{DS} = 10 V, V _{GS} = 0 V, f = 1.0 MHz		1082		pF
Output Capacitance	C _{oss}			277		pF
Reverse Transfer Capacitance	C _{rss}			130		pF
Turn-On Delay Time	t _{d(on)}	V _{DD} = 10 V, I _D = 1 A, V _{GS} = 4.5 V, R _{GEN} = 6 Ω		8	20	ns
Turn-On Rise Time	t _r			8	27	ns
Turn-Off Delay Time	t _{d(off)}			24	38	ns
Turn-Off Fall Time	t _f			8	16	ns
Total Gate Charge V _{GS} =5V	Q _g				12	17
Gate-Source Charge	Q _{gs}	V _{DS} = 10 V, I _D = 5.5 A, V _{GS} =4.5V(Note 2)		2		nC
Gate-Drain Charge	Q _{gd}			3		nC
Maximum Continuous Drain-Source Diode Forward Current	I _S				0.83	A
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} = 0 V, I _S = 0.83 A (Not 2)		0.7	1.2	V

Notes:

1 R^θJA is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. R^θJC is guaranteed by design while R^θCA is determined by the user's board design.

a) R^θJA is 125°C/W (steady state) when mounted on a 1 inch² copper pad on FR-4.

b) R^θJA is 208 °C/W (steady state) when mounted on a minimum copper pad on FR-4.

2. Pulse Test: Pulse Width < 300 μs, Duty Cycle < 2.0%