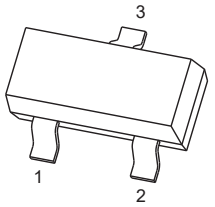
TKMN2300

20V N-Channel MOSFET

Product Summary

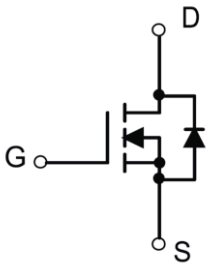
$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
20V	18mΩ@4.5V	4.5A
	22mΩ@2.5V	
	44mΩ@1.8V	

SOT-23



1. GATE
2. SOURCE
3. DRAIN

Schematic diagram



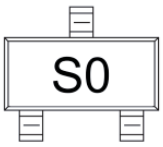
Feature

- TrenchFET Power MOSFET
- Excellent $R_{DS(on)}$ and Low Gate Charge

Application

- DC/DC Converter
- Load Switch for Portable Devices
- Battery Switch

MARKING:



ABSOLUTE MAXIMUM RATINGS (T_a=25℃ unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain - Source Voltage		V_{DS}	20	V
Gate - Source Voltage		V_{GS}	±12	V
Continuous Drain Current[1,5]	T_A = 25℃	I_D	4.5	A
Pulsed Drain Current[2]		I_{DM}	18	A
Power Dissipation[4,5]	T_A = 25℃	P_D	1.4	W
Thermal Resistance from Junction to Ambient[5]		$R_{\theta JA}$	89	℃/W
Junction and Storage Temperature Range		T_J,T_{STG}	-55~ +150	℃

MOSFET ELECTRICAL CHARACTERISTICS(T_a=25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
STATIC CHARACTERISTICS						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	20			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =20V,V_{GS} = 0V			1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±12V, V_{DS} = 0V			±100	nA
Gate threshold voltage[3]	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	0.4	0.7	1	V
Drain-source on-resistance[3]	$R_{DS(on)}$	V_{GS} =4.5V, I_D =3A		18	27	mΩ
		V_{GS} =2.5V, I_D =2A		22	35	
		V_{GS} =1.8V, I_D =2A		44	62	
Forward tranconductance[3]	g_{FS}	V_{DS} =10V, I_D =6A		5		S
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{iss}	V_{DS} =8V,V_{GS} =0V,f=1MHz		523		pF
Output Capacitance	C_{oss}			99		
Reverse Transfer Capacitance	C_{rss}			75		
SWITCHING CHARACTERISTICS						
Turn-on delay time	$t_{d(on)}$	V_{GS}=4.5V,V_{DS}=10V, I_D=1A,R_{GEN}=6Ω		10.5	21	ns
Turn-on rise time	t_r			4.5	9	
Turn-off delay time	$t_{d(off)}$			27.5	55	
Turn-off fall time	t_f			4.3	8.6	
Total gate charge	Q_g	V_{DS} =10V,V_{GS} =4.5V,I_D =6A		6.4	8.2	nC
Gate-source charge	Q_{gs}			1.8	2.3	
Gate-drain charge	Q_{gd}			1.3	1.9	
SOURCE-DRAIN DIODE CHARACTERISTICS						
Body Diode Voltage[3]	V_{SD}	I_S=1.7A, V_{GS} = 0V		0.8	1.2	V
Continuous Source-Drain Diode Current	I_S	T_C=25℃			1.7	A

Notes:

1.The maximum current rating is limited by package.

2.Pulse Test : Pulse Width ≤ 10μs, duty cycle ≤ 1%.

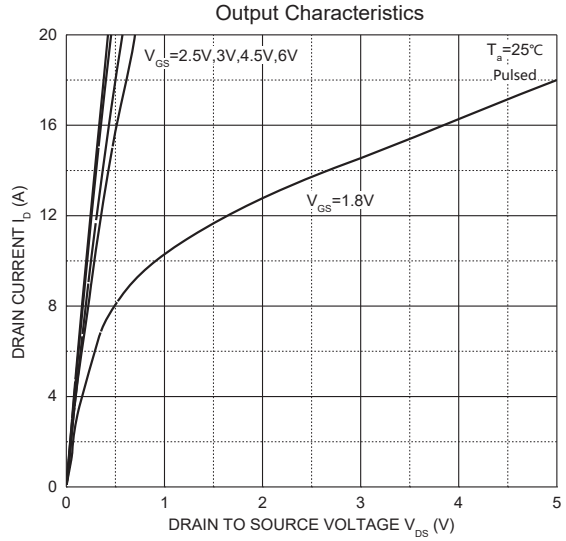
3.Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.

4.The power dissipation P_D is limited by $T_{J(MAX)}$ = 150°C.

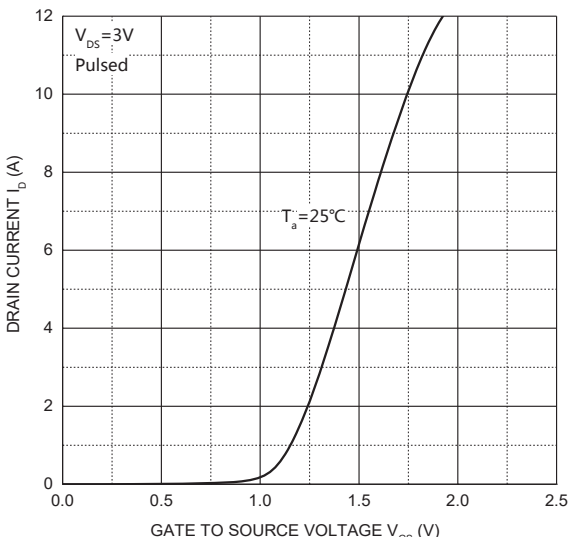
5.Device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.

Typical Electrical and Thermal Characteristics

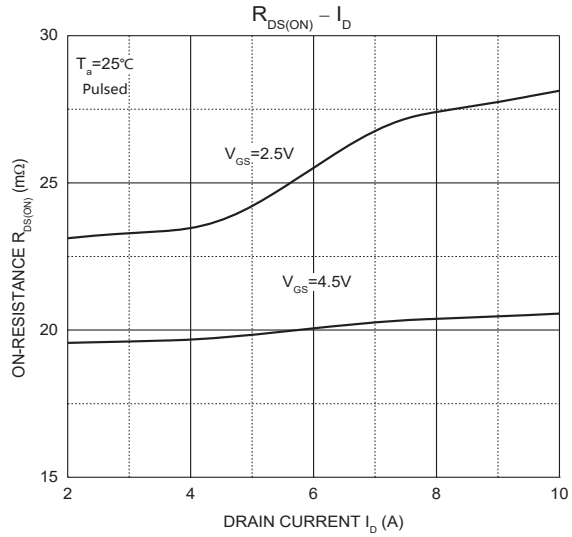
Output Characteristics



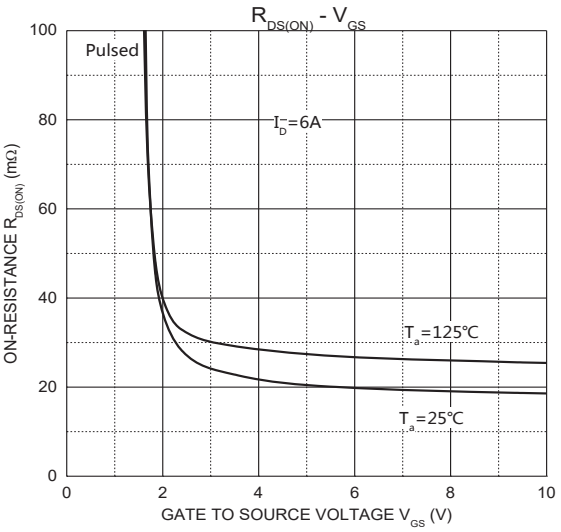
Transfer Characteristics



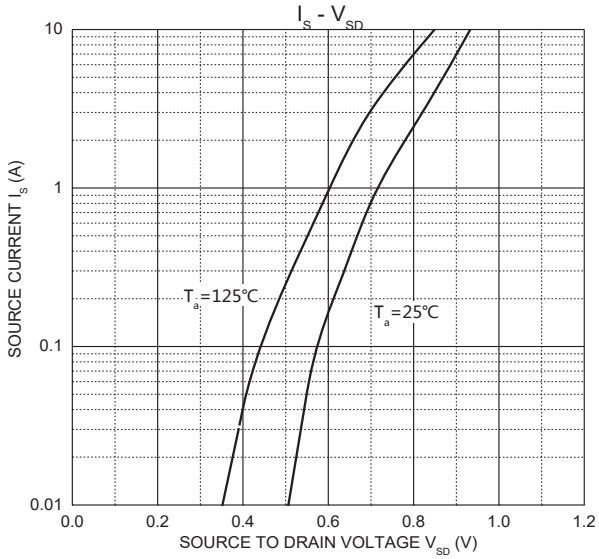
$R_{DS(ON)}$ – I_D



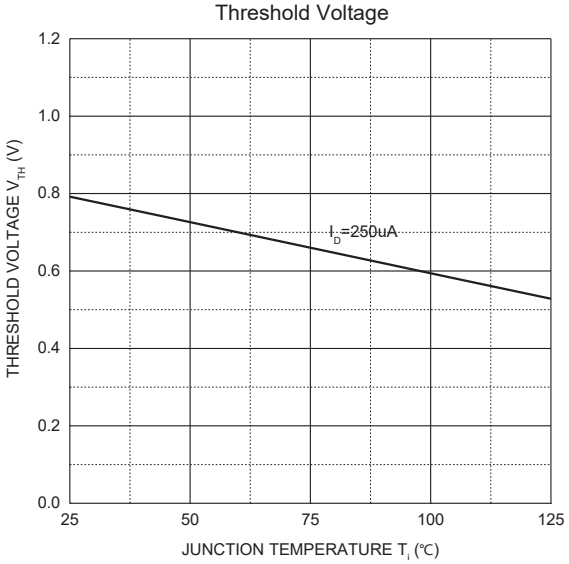
$R_{DS(ON)}$ - V_{GS}

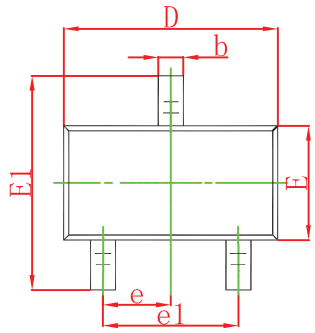


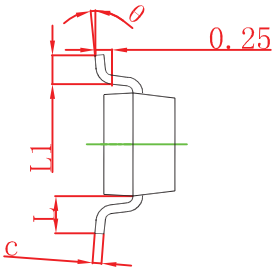
I_S - V_{SD}

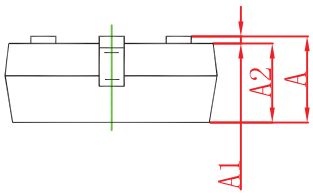


Threshold Voltage



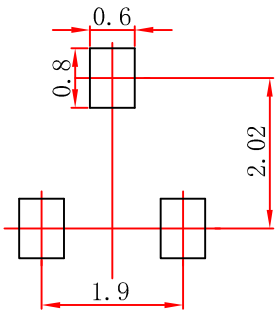






Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

SOT-23 Suggested Pad Layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.