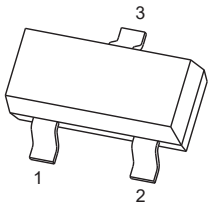
TKMN2304

30V N-Channel MOSFET

Product Summary

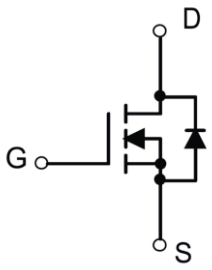
$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
30V	33mΩ@10V	3.3A
	43mΩ@4.5V	

SOT-23



1. GATE
2. SOURCE
3. DRAIN

Schematic diagram



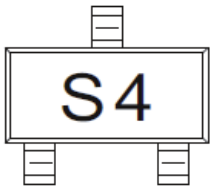
Feature

- TrenchFET Power MOSFET

Application

- Load Switch for Portable Devices
- DC/DC Converter

MARKING:



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

Parameter		Symbol	Value	Unit
Drain - Source Voltage		V_{DS}	30	V
Gate - Source Voltage		V_{GS}	±20	V
Continuous Drain Current[1,5]	T_A = 25℃	I_D	3.3	A
Pulsed Drain Current[2]		I_{DM}	13	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	30			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =30V,V_{GS} = 0V			1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1	1.6	2.2	V
Drain-source on-resistance[3]	$R_{DS(on)}$	V_{GS} =10V, I_D =3.2A		33	60	mΩ
		V_{GS} =4.5V, I_D =2.8A		43	75	
Forward tranconductance[3]	g_{FS}	V_{DS} =4.5V, I_D =2.5A	2.5			S
Dynamic characteristics						
Total gate charge	Q_g	V_{DS} =15V,V_{GS} =10V,I_D =3.4A		4.5	6.7	nC
		V_{DS} =15V,V_{GS} =4.5V,I_D =3.4A		2.1	3.2	
Gate-source charge	Q_{gs}			0.85		
Gate-drain charge	Q_{gd}			0.65		
Gate resistance	R_g	f =1.0MHz	0.8	4.4	8.8	Ω
Input Capacitance	C_{iss}	V_{DS} =15V,V_{GS} =0V,f =1MHz		235		pF
Output Capacitance	C_{oss}			45		
Reverse Transfer Capacitance	C_{rss}			17		
Turn-on delay time	$t_{d(on)}$	V_{DD}=15V, R_L=5.6Ω, I_D ≈2.7A, V_{GEN}=4.5V,Rg=1Ω		12	20	ns
Turn-on rise time	t_r			50	75	
Turn-off delay time	$t_{d(off)}$			12	20	
Turn-off fall time	t_f			22	35	
Turn-on delay time	$t_{d(on)}$	V_{DD}=15V, R_L=5.6Ω, I_D ≈2.7A, V_{GEN}=10V,Rg=1Ω		5	10	
Turn-on rise time	t_r			12	20	
Turn-off delay time	$t_{d(off)}$			10	15	
Turn-off fall time	t_f			5	10	
Source-Drain Diode characteristics						
Continuous source-drain diode current	I_S	T_C=25℃			1.4	A
Pulse diode forward current	I_{SM}				15	A
Body diode voltage[3]	V_{SD}	I_S=2.7A,V_{GS}=0V			1.2	V

Notes:

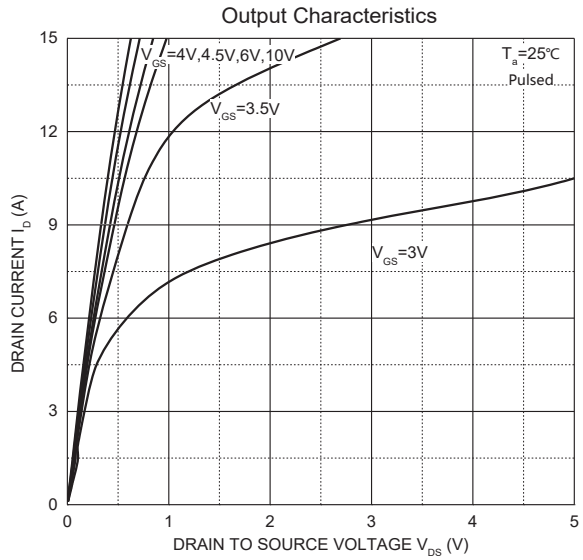
1.The maximum current rating is limited by package.

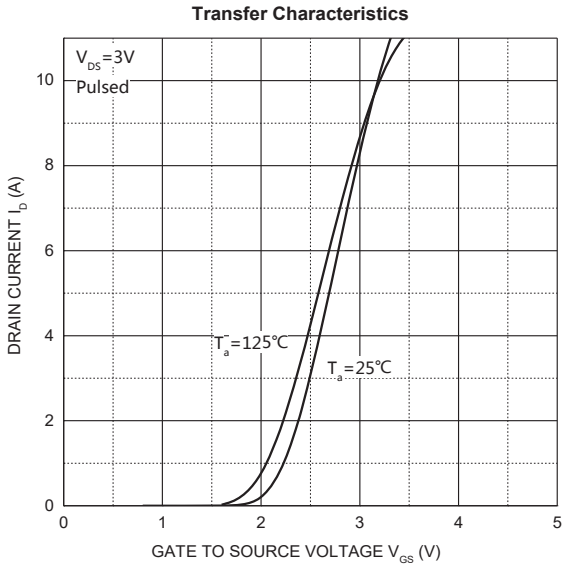
2.Pulse Test : Pulse Width ≤ 10μs, duty cycle ≤ 1%.

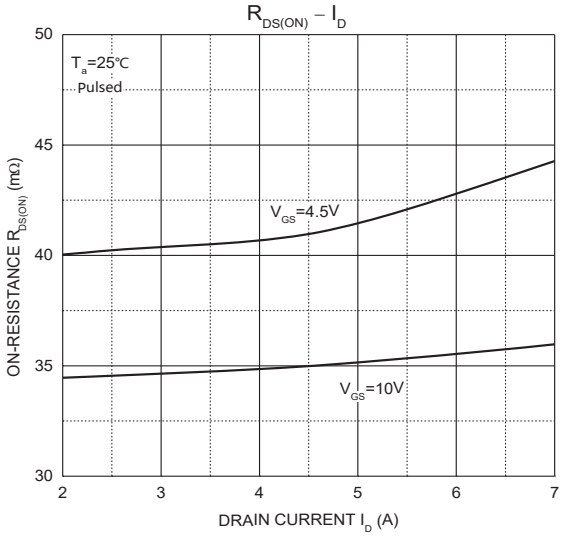
3.Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.

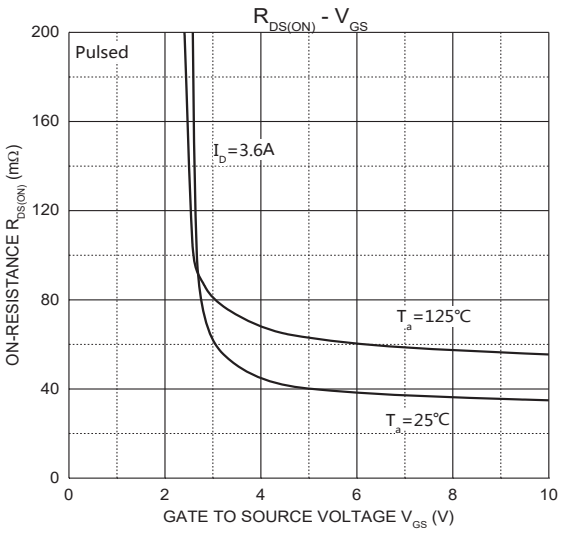
4.The power dissipation P_D is limited by $T_{J(MAX)}$ = 150°C.

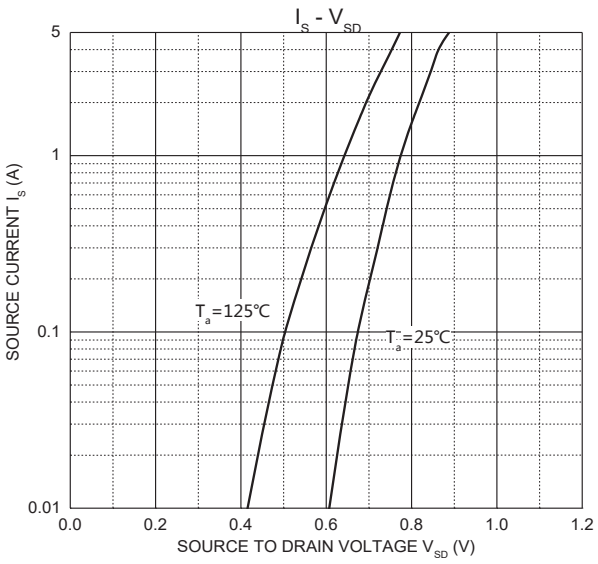
5.Device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.

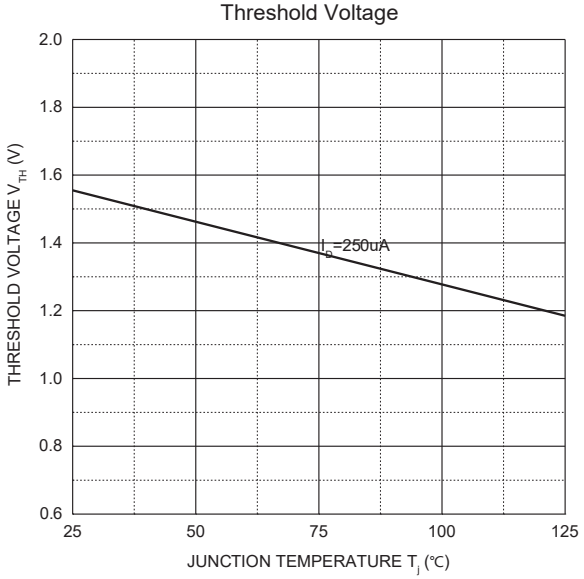

Output Characteristics
V_GS=4V,4.5V,6V,10V
V_GS=3.5V
V_GS=3V
T_a=25℃
Pulsed
DRAIN CURRENT I_D (A)
DRAIN TO SOURCE VOLTAGE V_DS (V)

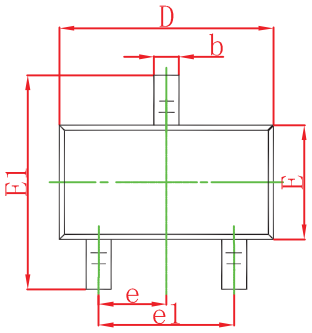

Transfer Characteristics
V_DS=3V
Pulsed
T_a=125℃
T_a=25℃
DRAIN CURRENT I_D (A)
GATE TO SOURCE VOLTAGE V_GS (V)

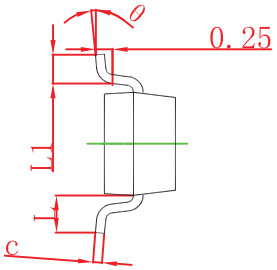

R_DS(ON) – I_D
T_a=25℃
Pulsed
V_GS=4.5V
V_GS=10V
ON-RESISTANCE R_DS(ON) (mΩ)
DRAIN CURRENT I_D (A)

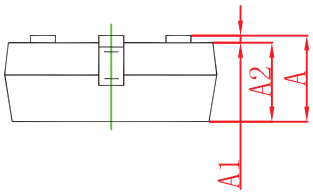

R_DS(ON) - V_GS
Pulsed
I_D=3.6A
T_a=125℃
T_a=25℃
ON-RESISTANCE R_DS(ON) (mΩ)
GATE TO SOURCE VOLTAGE V_GS (V)


I_S - V_SD
T_a=125℃
T_a=25℃
SOURCE CURRENT I_S (A)
SOURCE TO DRAIN VOLTAGE V_SD (V)


Threshold Voltage
I_D=250uA
THRESHOLD VOLTAGE V_TH (V)
JUNCTION TEMPERATURE T_j (℃)

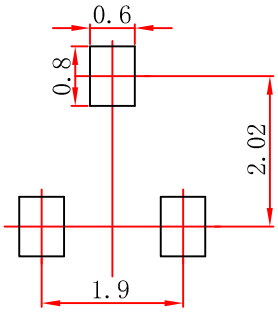






Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 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.