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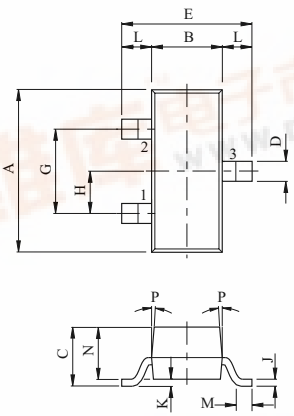
KMB4D0N30SA

N-Ch Trench MOSFET

General Description

This Trench MOSFET has better characteristics, such as fast switching time, low on resistance, low gate charge and excellent avalanche characteristics. It is mainly suitable for portable equipment and SMPS.



DIM	MILLIMETERS
A	2.93±0.20
B	1.30+0.20/-0.15
C	1.30 MAX
D	0.40+0.15/-0.05
E	2.40+0.30/-0.20
G	1.90
H	0.95
J	0.13+0.10/-0.05
K	0.00 ~ 0.10
L	0.55
M	0.20 MIN
N	1.00+0.20/-0.10
P	7°

SOT-23

FEATURES

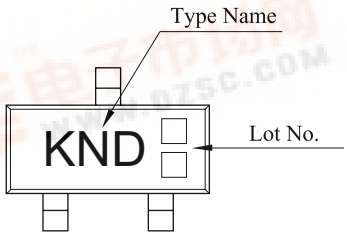
- V_{DSS}=30V, I_D=4A
- Drain-Source ON Resistance
  $R_{DS(ON)}$=47m Ω (Max.) @ V_{GS}=10V
  $R_{DS(ON)}$=65m Ω (Max.) @ V_{GS}=4.5V
- Super Hige Dense Cell Design

MAXIMUM RATING (Ta=25℃)

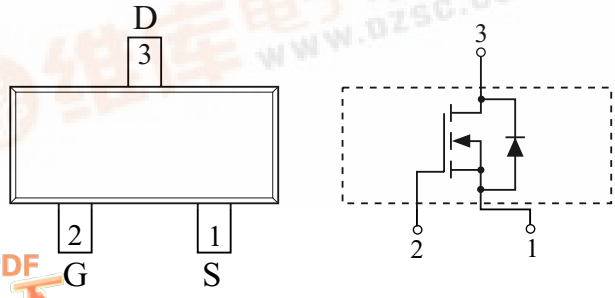
CHARACTERISTIC		SYMBOL	N-Ch	UNIT
Drain-Source Voltage		V_{DSS}	30	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current	DC@T_A=25℃	I_D	4.0	A
	DC@T_A=70℃		3.5	
	Pulsed	I_{DP}	20	
Drain-Source-Diode Forward Current		I_S	1.04	A
Drain Power Dissipation	T_A=25℃	P_D	1.25	W
	T_A=70℃		0.8	
Maximum Junction Temperature		T_j	150	℃
Storage Temperature Range		T_{stg}	-55 ~150	℃
Thermal Resistance, Junction to Ambient		R_{thJA}	130	℃/W

Note : Surface Mounted on FR4 Board, t≤10sec.

Marking



PIN CONNECTION (TOP VIEW)



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ELECTRICAL CHARACTERISTICS (Ta=25℃)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	I_{DS}=250μA, V_{GS}=0V,	30	-	-	V
Drain Cut-off Current	I_{DSS}	V_{GS}=0V, V_{DS}=30V	-	-	0.5	μA
		V_{GS}=0V, V_{DS}=30V, Tj=55℃	-	-	10	
Gate Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	V_{th}	V_{DS}=V_{GS}, I_D=250μA	1.0	-	3.0	V
Drain-Source ON Resistance	$R_{DS(ON)}$*	V_{GS}=10V, I_D=3.5A	-	38	47	mΩ
		V_{GS}=4.5V, I_D=2.8A	-	52	65	
On-State Drain Current	$I_{D(ON)}$*	V_{GS}=5V, V_{DS}=4.5V	6	-	-	A
Forward Transconductance	g_{fs}*	V_{DS}=5V, I_D=2.5A	-	7	-	S
Dynamic (Note 3)						
Input Capaclitance	C_{iss}	V_{DS}=15V, f=1MHz, V_{GS}=0V	-	305	-	pF
Ouput Capacitance	C_{oss}		-	65	-	
Reverse Transfer Capacitance	C_{rss}		-	29	-	
Total Gate Charge	Q_g*	V_{DS}=15V, V_{GS}=10V, I_D=2.5A	-	6	9	nC
Gate-Source Charge	Q_{gs}*		-	1.6	-	
Gate-Drain Charge	Q_{gd}*		-	1.0	-	
Turn-On Delat Time	$t_{d(on)}$*	V_{DD}=15V, V_{GS}=10V I_D=1A, R_G=6 Ω (NOTE 1)	-	7	11	ns
Turn-On Rise Time	t_r*		-	12	18	
Turn-On Deley Time	$t_{d(off)}$*		-	14	25	
Turn-On Fall Time	t_r*		-	6	10	
Source-Drain Diode Ratings						
Source-Drain Forward Voltage	V_{SDF}*	V_{GS}=0V, I_{DR}=1.25A	-	0.8	1.2	V
NOTE 1> * : Pulse Test : Pulse width <300μs , Duty cycle < 2%						

Fig1. V_{DS} - I_D

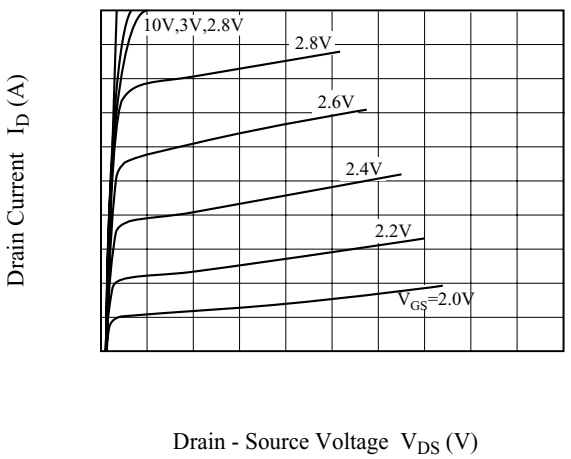


Fig2. $R_{DS(ON)}$ - I_D

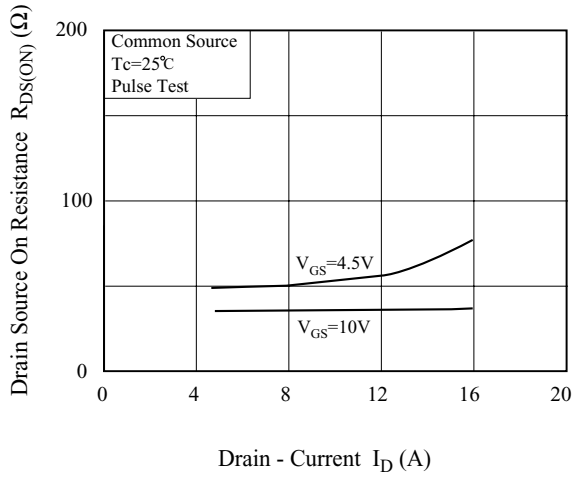


Fig3. V_{GS} - I_D

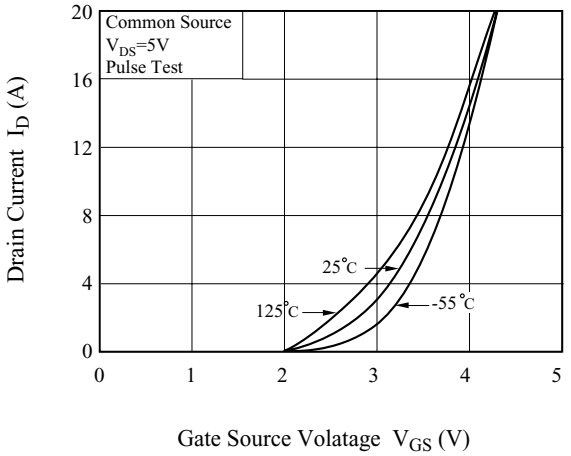


Fig4. $R_{DS(ON)}$ - T_j

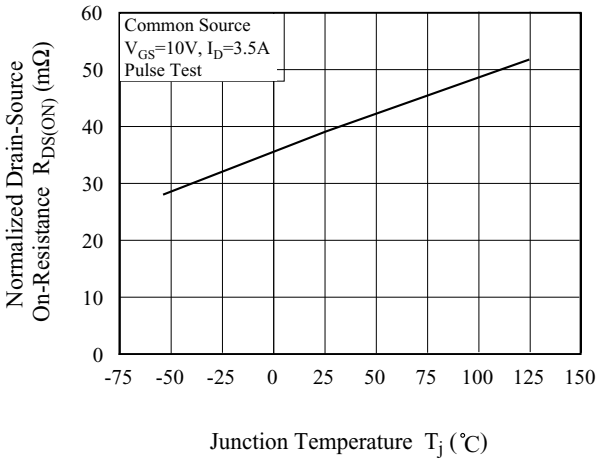


Fig5. V_{th} - T_j

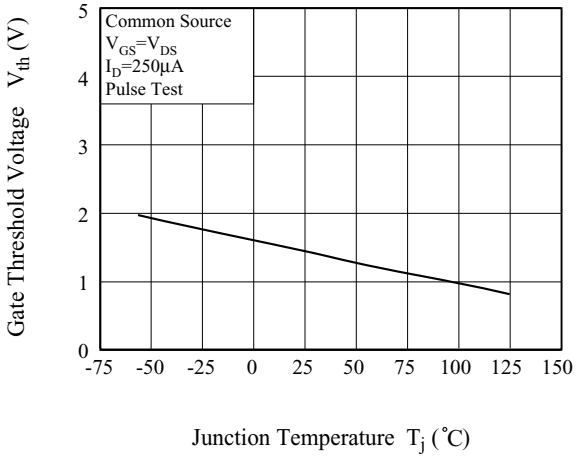


Fig6. I_S - V_{SDF}

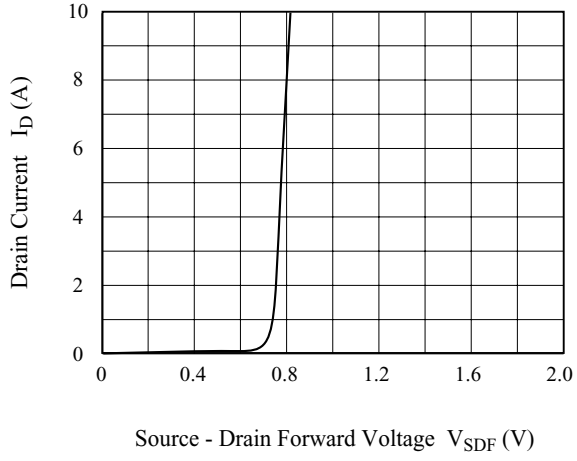


Fig7. Transient Thermal Response Curve

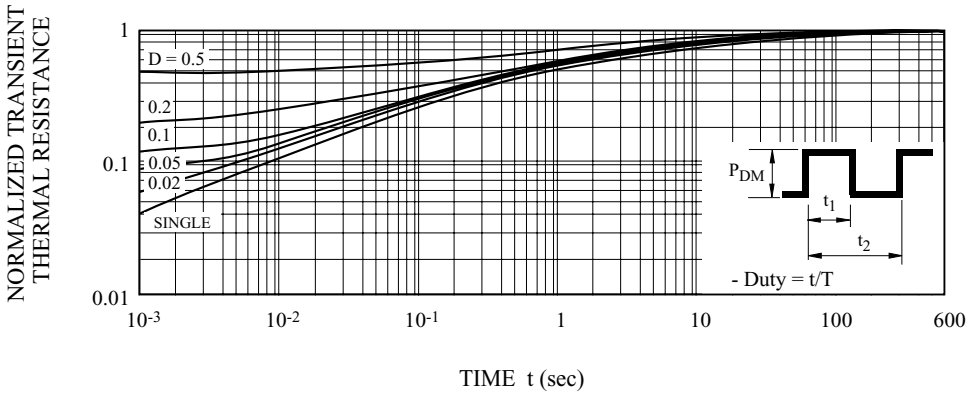


Fig8. Safe Operation Area

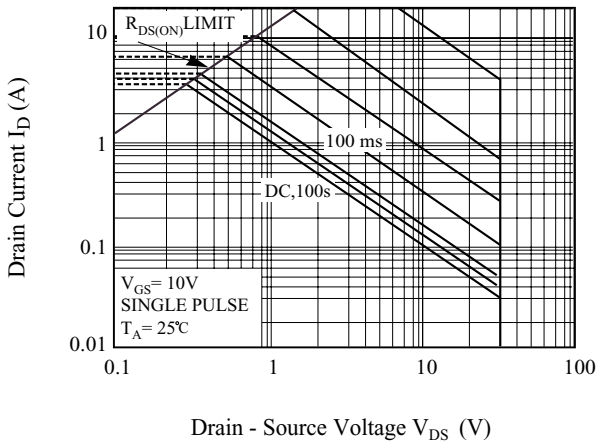
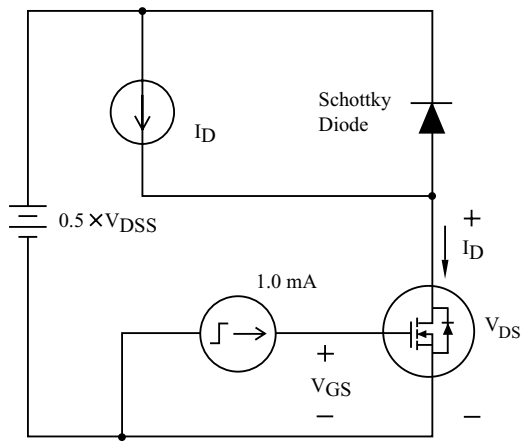


Fig9. Gate Charge Circuit and Wave Form



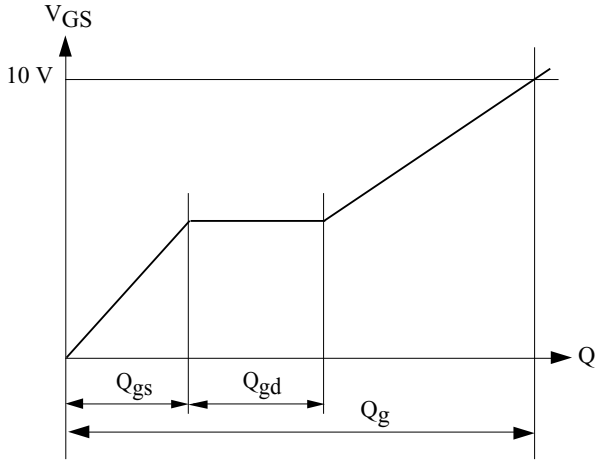


Fig10. Resistive Load Switching