

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 load switch and Back light inverter.

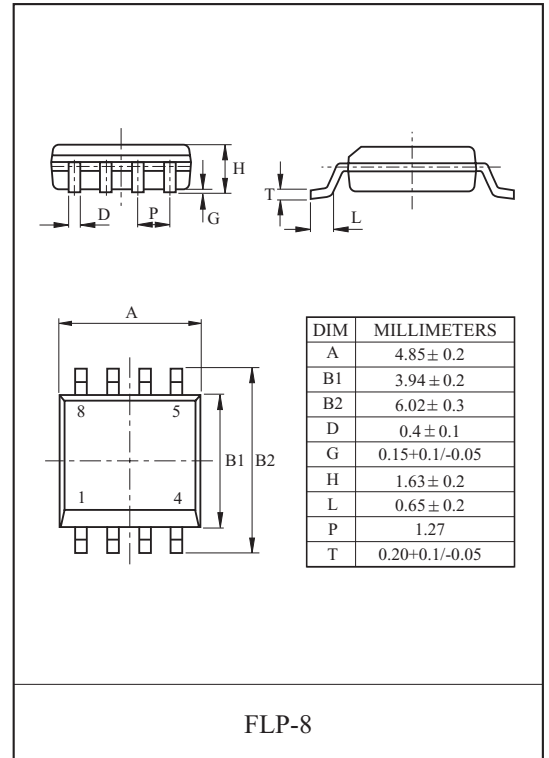
FEATURES

- $V_{DSS}=60V$, $I_D=4.5A$.
- Drain-Source ON Resistance.
 $R_{DS(ON)}=56m\ \Omega$ (Max.) @ $V_{GS}=10V$
 $R_{DS(ON)}=77m\ \Omega$ (Max.) @ $V_{GS}=4.5V$

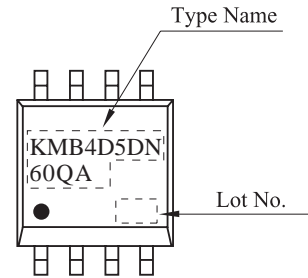
MOSFET Maximum Ratings ($T_a=25\ ^\circ C$ Unless otherwise noted)

CHARACTERISTIC	SYMBOL	RATING	UNIT	
Drain Source Voltage	V_{DSS}	60	V	
Gate Source Voltage	V_{GSS}	± 20	V	
Drain Current	DC@ $T_a=25\ ^\circ C$	I_D^*	4.5	A
	Pulsed	I_{DP}	20	A
Drain Source Diode Forward Current	I_S	3	A	
Drain Power Dissipation	@ $T_a=25\ ^\circ C$	P_D^*	2	W
Maximum Junction Temperature	T_j	150	$^\circ C$	
Storage Temperature Range	T_{stg}	-55~150	$^\circ C$	
Thermal Resistance, Junction to Ambient	R_{thJA}^*	62.5	$^\circ C/W$	

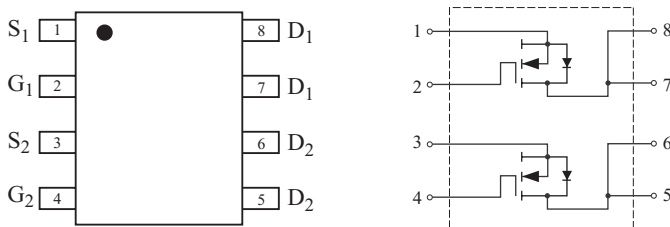
Note> *Surface Mounted on 1" x 1" FR4 Board, $t \leq 10sec$.



Marking



PIN CONNECTION (TOP VIEW)



KMB4D5DN60QA

ELECTRICAL CHARACTERISTICS (Ta=25 °C) UNLESS OTHERWISE NOTED

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT		
Static								
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_{DS}=250\mu A$	60	-	-	V		
Drain Cut-off Current	I_{DSS}	$V_{GS}=0V, V_{DS}=48V$	-	-	1	μA		
Gate Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA		
Gate Threshold Voltage	V_{th}	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	-	3.0	V		
Drain-Source ON Resistance	$R_{DS(ON)}^*$	$V_{GS}=10V, I_D=4.5A$	-	46	56	m Ω		
		$V_{GS}=4.5V, I_D=3A$	-	64	77			
Forward Transconductance	g_{fs}^*	$V_{DS}=5V, I_D=4.5A$	-	11	-	S		
Dynamic								
Input Capacitance	C_{iss}^*	$V_{DS}=30V, V_{GS}=0V, f=1MHz$	-	490	-	pF		
Output Capacitance	C_{oss}^*		-	45	-			
Reverse Transfer Capacitance	C_{rss}^*		-	25	-			
Total Gate Charge	$V_{GS}=10V$	$V_{DS}=30V, V_{GS}=10V, I_D=4.5A$	-	10.4	-	nC		
	$V_{GS}=4.5V$		-	5.1	-			
Gate-Source Charge	Q_{gs}^*		-	2.3	-			
Gate-Drain Charge	Q_{gd}^*		-	2.2	-			
Turn-On Delay Time	$t_{d(on)}^*$		$V_{DS}=30V, V_{GS}=10V$ $I_D=4.5A, R_G=3 \Omega$	-	12.4		-	ns
Turn-On Rise Time	t_r^*			-	34.5		-	
Turn-Off Delay Time	$t_{d(off)}^*$	-		30.7	-			
Turn-Off Fall Time	t_f^*	-		5.0	-			
Source-Drain Diode Ratings								
Source-Drain Forward Voltage	V_{SDF}^*	$V_{GS}=0V, I_S=1A$	-	0.7	1.0	V		
Note> *Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$								

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Fig1. $I_D - V_{DS}$

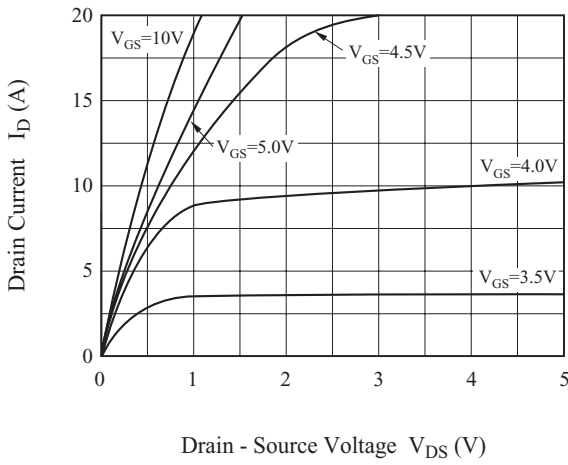


Fig2. $R_{DS(ON)} - I_D$

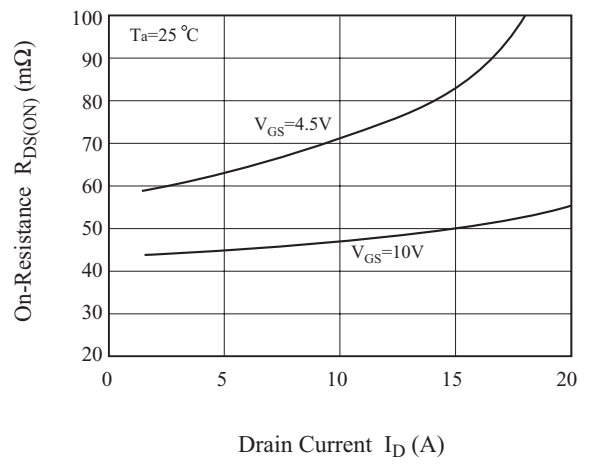


Fig3. $I_D - V_{GS}$

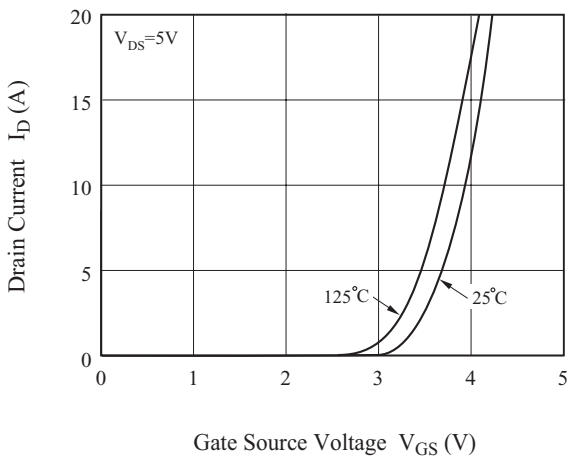


Fig4. $R_{DS(on)} - T_j$

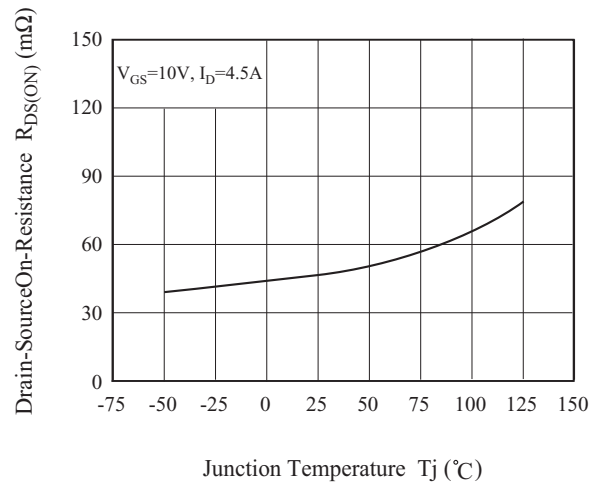


Fig5. $V_{th} - T_j$

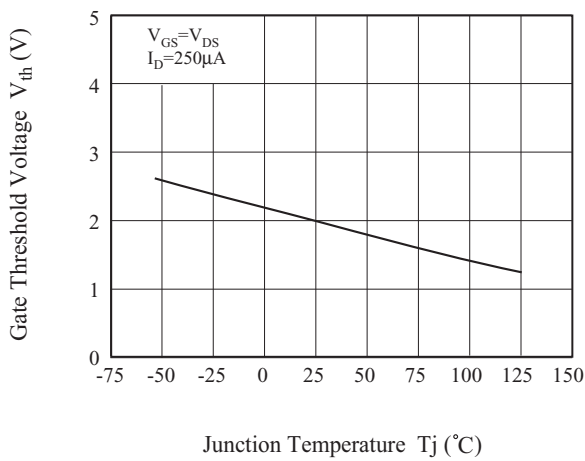
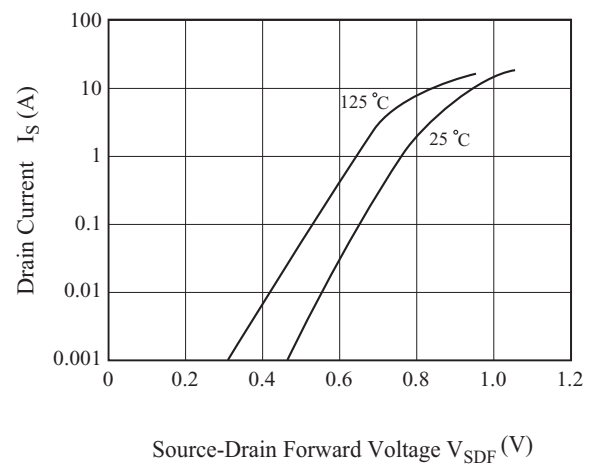


Fig 6. $I_S - V_{SDF}$



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Fig7. $V_{GS} - Q_g$

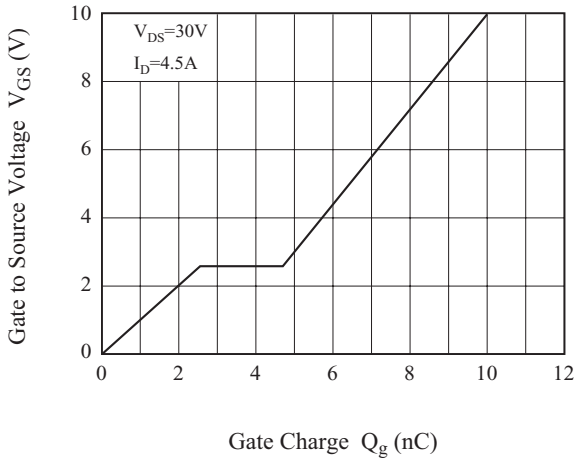


Fig8. $C - V_{DS}$

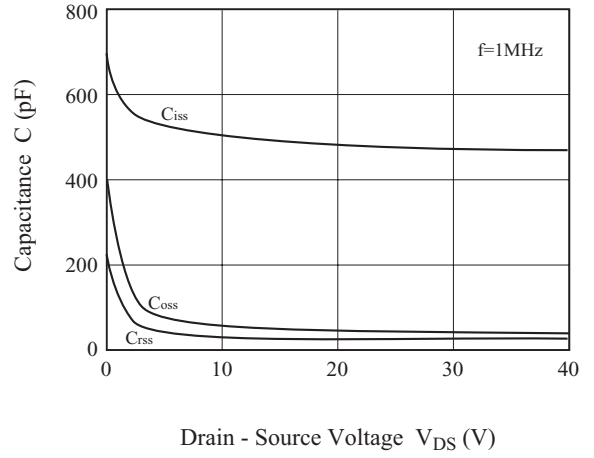


Fig9. Safe Operation Area

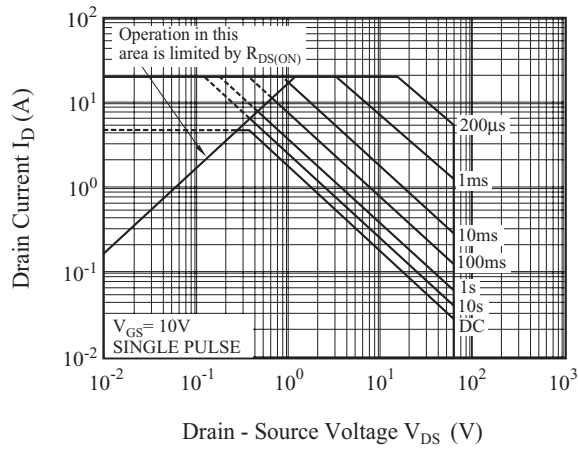


Fig9. Transient Thermal Response Curve

