

KEC

SEMICONDUCTOR
TECHNICAL DATA

KMB3D5PS30QA

SBD and P-Ch Trench MOSFET

GENERAL DESCRIPTION

- It is particularly suited for switching such as DC/DC Converters.
- It is driven as low as 4.5V and fast switching, high efficiency.

FEATURES

- $V_{DS} = -30V$, $I_D = -3.5A$.
- Drain-Source ON Resistance.
 $R_{DS(ON)} = 85m\ \Omega$ (Max.) @ $V_{GS} = -10V$
 $R_{DS(ON)} = 180m\ \Omega$ (Max.) @ $V_{GS} = -4.5V$

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

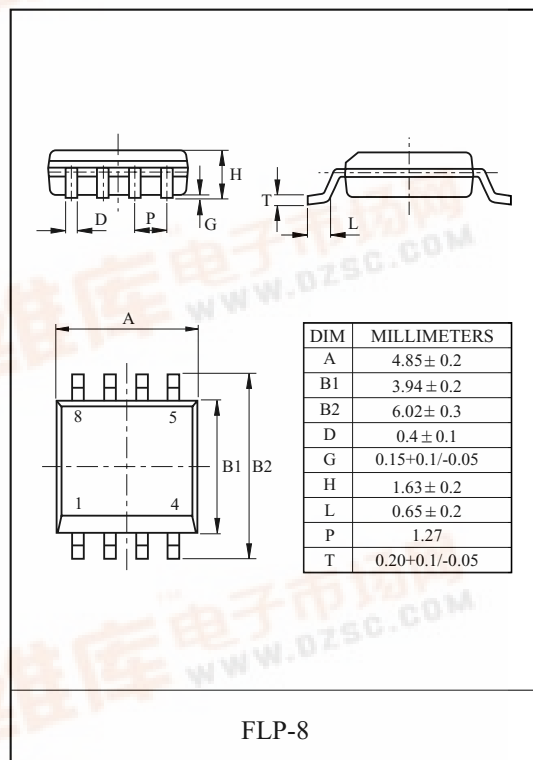
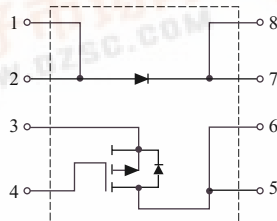
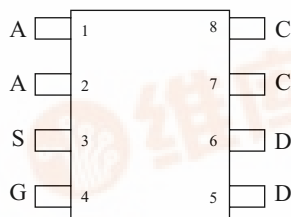
CHARACTERISTIC		SYMBOL	PATING	UNIT
Drain Source Voltage		V_{DS}	-30	V
Gate Source Voltage		V_{GS}	± 20	V
Drain Current	DC	I_D^*	-3.5	A
	Pulsed	I_{DP}	-20	A
Drain Power Dissipation	25 °C	P_D^*	1.4	W
	100 °C		1	W
Maximum Junction Temperature		T_j	150	°C
Storage Temperature Range		T_{stg}	-55~150	°C
Thermal Resistance, Junction to Ambient		R_{thJA}^*	90	°C/W

Note : *Surface Mounted on FR4 Board

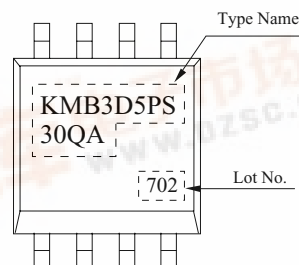
Schottky Diode Maximum Ratings ($T_a = 25^\circ C$ Unless otherwise noted)

CHARACTERISTIC	SYMBOL	PATING	UNIT
Repetitive Peak Reverse Voltage	V_{RRM}	30	V
Average Forward Current	I_F	1.4	A

PIN CONNECTION (TOP VIEW)



Marking



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ELECTRICAL CHARACTERISTICS (Ta=25℃) UNLESS OTHERWISE NOTED

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=-250\mu A$, $V_{GS}=0V$	-30	-	-	V
Drain Cut-off Current	I_{DSS}	$V_{DS}=-30V$, $V_{GS}=0V$	-	-	-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	$R_{DS(ON)}$	$V_{GS}=-10.0V$, $I_D=-2.5A$	-	66	85.0	m Ω
		$V_{GS}=-4.5V$, $I_D=-1.8A$	-	125	180.0	
Forward Transconductance	G_{fs}	$V_{DS}=-10V$, $I_D=-2.5A$	-	5.0	-	S
Dynamic (Note 3)						
Input Capacitance	C_{iss}	$V_{DS}=-10V$, $f=1MHz$	-	550	-	pF
Ouput Capacitance	C_{oss}		-	210	-	
Reverse Transfer Capacitance	C_{rss}		-	50	-	
Total Gate Charge	Q_g	$V_{DS}=-10V$, $V_{GS}=-10V$, $I_D=-2.5A$	-	8.7	-	nC
Gate-Source Charge	Q_{gs}		-	1.9	-	
Gate-Drain Charge	Q_{gd}		-	1.3	-	
Turn-On Delat Time	$t_{d(on)}$	$V_{DD}=-10V$, $V_{GS}=-10V$ $I_D=10\ \Omega$, $R_G=50\ \Omega$ (Note 1)	-	7	-	ns
Turn-On Rise Time	t_r		-	9	-	
Turn-On Deley Time	$t_{d(off)}$		-	14	-	
Turn-On Fall Time	t_f		-	8	-	
Source-Drain Diode Ratings						
Source-Drain Forward Voltage	V_{SDF}	$I_{DR}=-1.7A$, $V_{GS}=0V$	-	-	-1.2	V
Note						
1. Pulse Test : Pulse width $\leq 10\mu s$, Duty cycle $\leq 1\%$						

SHOTTKY DIODE ELECTRICAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Forward Voltage Drop	V_F	$I_F=1.0A$	-	0.45	0.5	V
Reverse Leakage Current	I_R	$V_R=30V$	-	0.004	0.1	mA
Junction Capacitance	C_T	$V_R=10V$	-	62	-	PF

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Fig1. I_D - V_{GS}

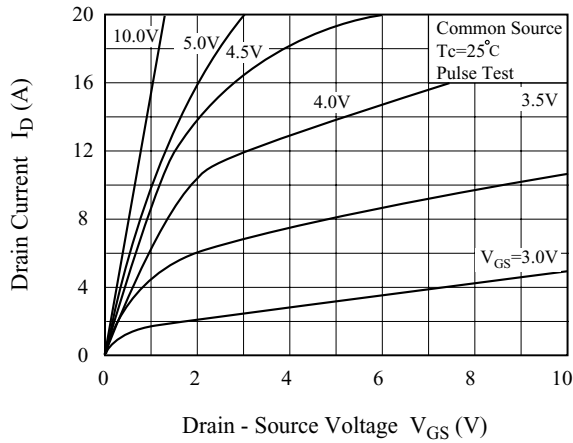


Fig2. $R_{DS(on)}$ - I_D

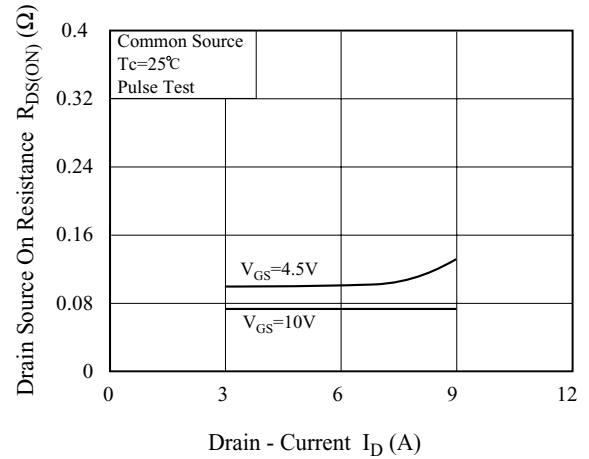


Fig3. I_D - V_{GS}

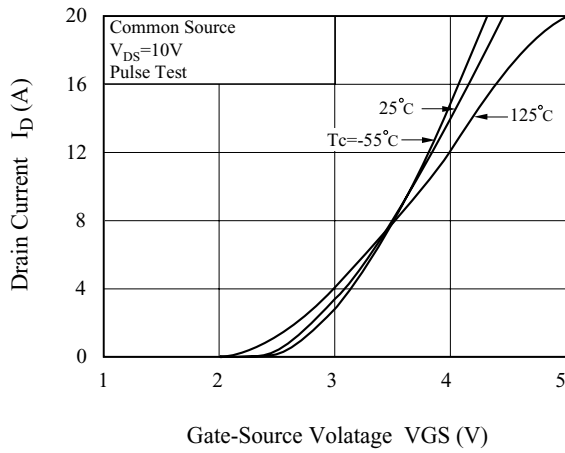


Fig4. $R_{DS(on)}$ - T_j

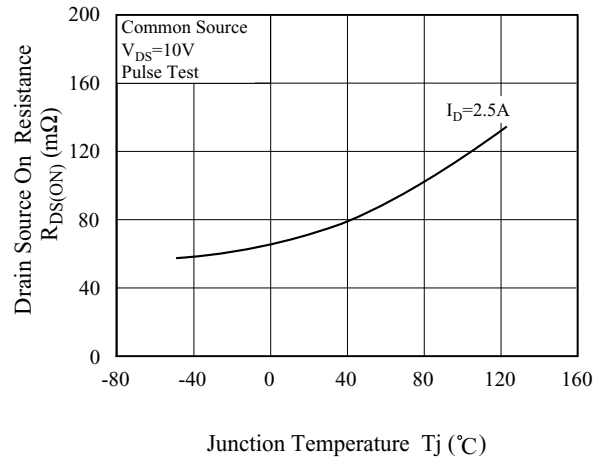


Fig5. V_{th} - T_j

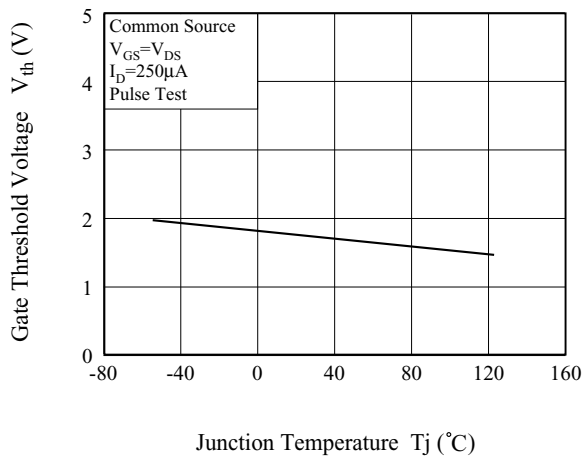
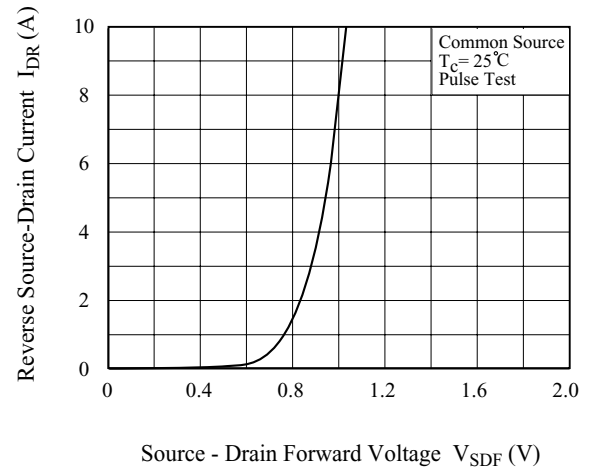


Fig6. I_{DR} - V_{SDF}



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Fig7. Forward Voltage Drop

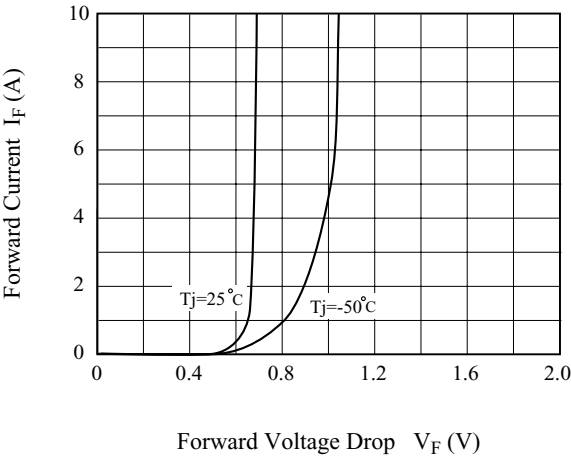


Fig8. Safe Operation Area

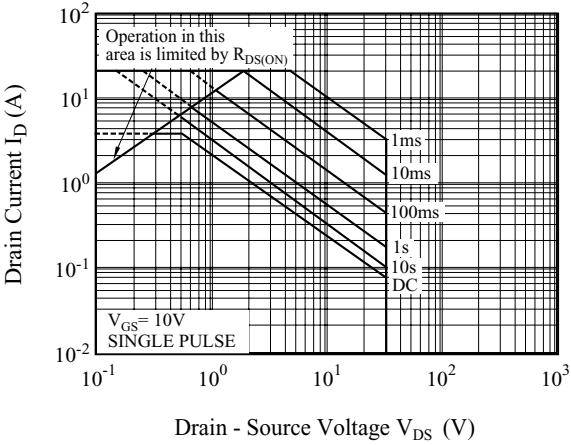
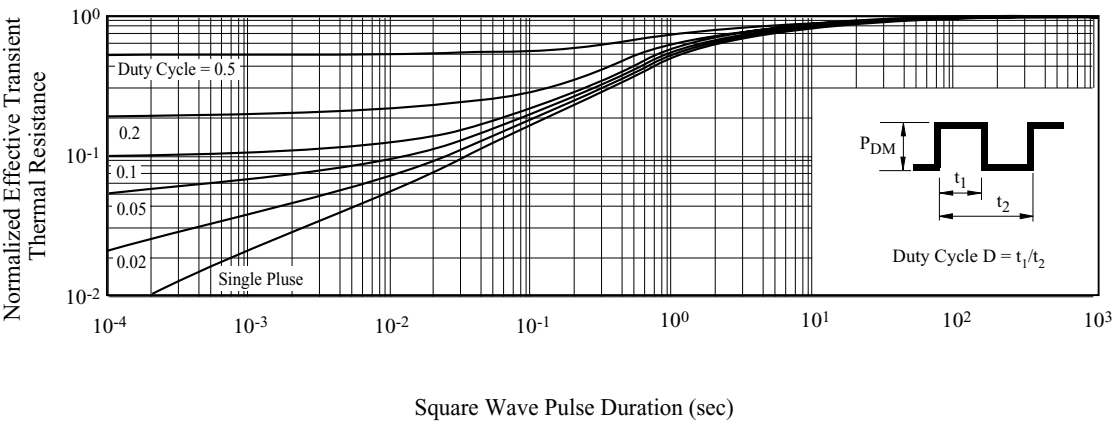


Fig9. Transient Thermal Response Curve



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Fig10. Gate Charge Circuit and Wave Form

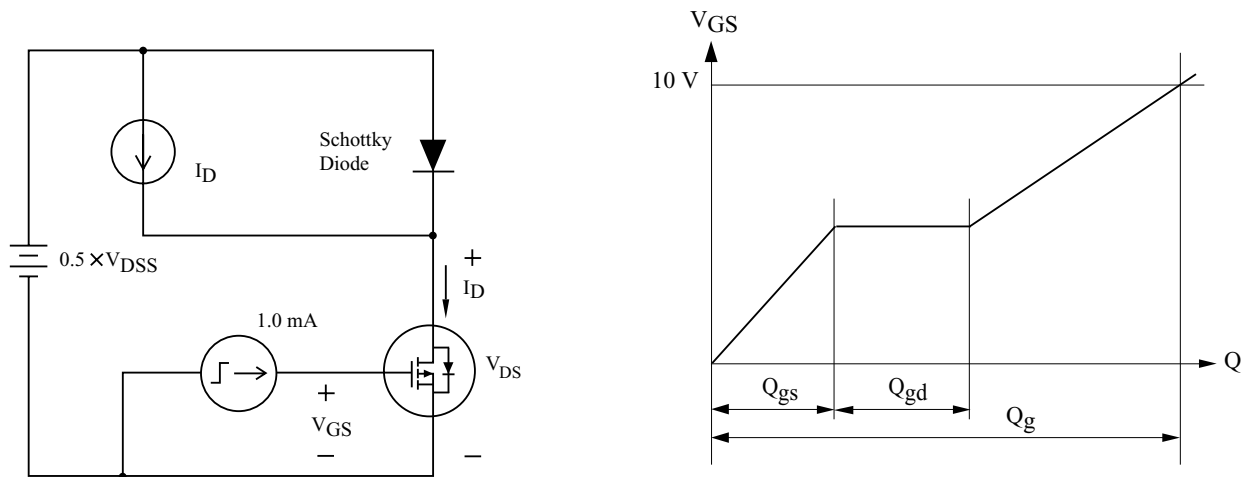


Fig11. Resistive Load Switching

