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KEC

SEMICONDUCTOR
TECHNICAL DATA

KMB060N60PA
N CHANNEL MOS FIELD EFFECT TRANSISTOR

General Description

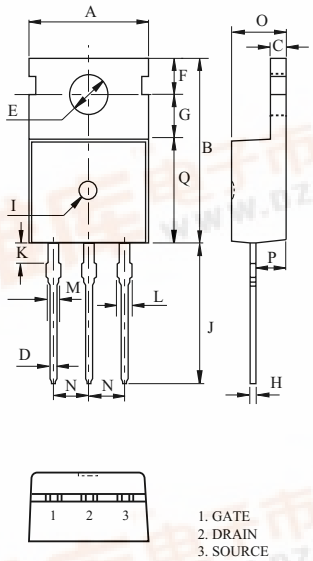
It s mainly suitable for low viltage applications such as automotive, DC/DC converters and a load switch in battery powered applications

FEATURES

· V_{DSS}= 60V, I_D= 60A

· Drain-Source ON Resistance :

$R_{DS(ON)}$=14m Ω (Max.) @V_{GS} = 10V



DIM	MILLIMETERS
A	9.9 ± 0.2
B	15.95 MAX
C	1.3+0.1/-0.05
D	0.8 ± 0.1
E	ø3.6 ± 0.2
F	2.8 ± 0.1
G	3.7
H	0.5+0.1/-0.05
I	ø1.5
J	13.08 ± 0.3
K	1.46
L	1.4 ± 0.1
M	1.27 ± 0.1
N	2.54 ± 0.2
O	4.5 ± 0.2
P	2.4 ± 0.2
Q	9.2 ± 0.2

TO-220AB

MOSFET MAXIMUM RATING (Ta=25℃ Unless otherwise noted)

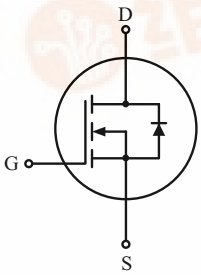
CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	60	V
Gate-Source Voltage		V_{GSS}	±25	V
Drain Current	DC	I_D*	60	A
	Pulsed (Note 1)	I_{DP}	240	A
Drain-Source Diode Forward Current		I_S	60	A
Drain Power Dissipation		P_D* 25℃	150	W
Maximum Junction Temperature		T_j	-55～175	℃
Storage Temperature Range		T_{stg}	-55～175	℃

Note1) Pulse Test : Pulse width ≤ 10μS Duty cycle ≤1%

Thermal Characteristics

CHARACTERISTIC	SYMBOL	RATING	UNIT
Thermal Resistance, Junction-to-Ambient	R_{thJA}	62.5	℃/W
Thermal Resistance, Junction-to-Case	R_{thJC}	1.0	℃/W

Equivalent Circuit



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KMB060N60PA

MOSFET 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㎂, V_{GS}=0V	60	-	-	V
Drain Cut-off Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V,	-	-	1	㎂
Gate Leakage Current	I_{GSS}	V_{GS}=±15V, V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	V_{th}	V_{DS}=V_{GS}, I_D=250㎂	2.0	-	4.0	V
Drain-Source ON Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=30A	-	11.5	14	mΩ
Forward Transconductance	g_{FS}	V_{DS}=15V, I_D=30A	-	20	-	S
Dynamic						
Input Capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, f=1.0MHz	-	2000	-	pF
Output Capacitance	C_{oss}		-	360	-	
Reverse Transfer Capacitance	C_{rss}		-	125	-	
Total Gate Charge	Q_g	V_{DS}= 48V, V_{GS}= 10V, I_D=30A (Note1,2)	-	70	-	nC
Gate-Source Charge	Q_{gs}		-	15	-	
Gate-Drain Charge	Q_{gd}		-	20	-	
Turn-On Delay Time	$t_{d(on)}$	V_{DD}= 30V I_D=30A R_G= 25 Ω (Note1,2)	-	35	-	ns
Turn-On Rise Time	t_r		-	220	-	
Turn-Off Delay Time	$t_{d(off)}$		-	55	-	
Turn-Off Fall Time	t_r		-	30	-	

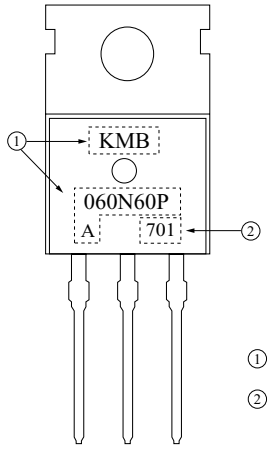
Note 1) Pulse Test : Pulse width ≤10㎲, Duty Cycle ≤1%.

Note 2) Essentially Independent of Operating Temperature.

DIODE Electrical Characteristics (Ta=25℃ Unless otherwise noted)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Diode Forward Voltage	V_{SD}	I_{SD}=60A, V_{GS}=0V	-	-	1.5	V
Reverse Recovery Time	T_{rr}	V_{GS}=0V, I_S=60A, dIF/dt=100A/㎲	-	110	-	ns

Marking



① PRODUCT NAME

② LOT NO

Fig 1. I_D - V_{DS}

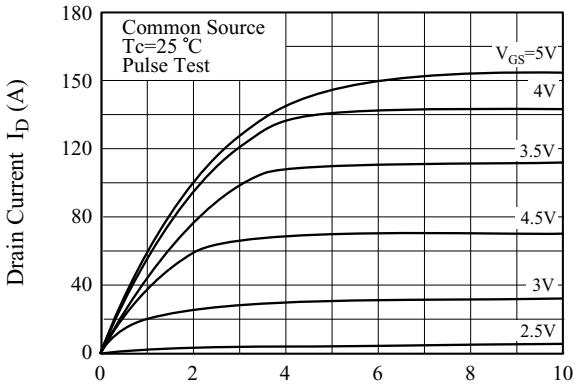


Fig 2. $R_{DS(ON)}$ - I_D

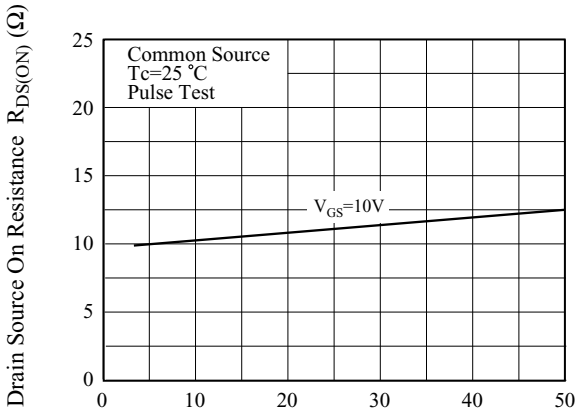


Fig 3. I_D - V_{GS}

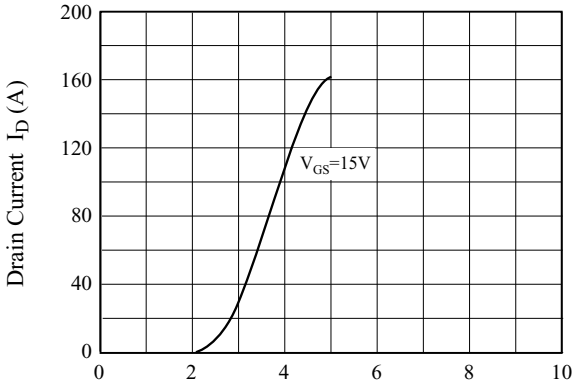


Fig 4. $R_{DS(ON)}$ - T_j

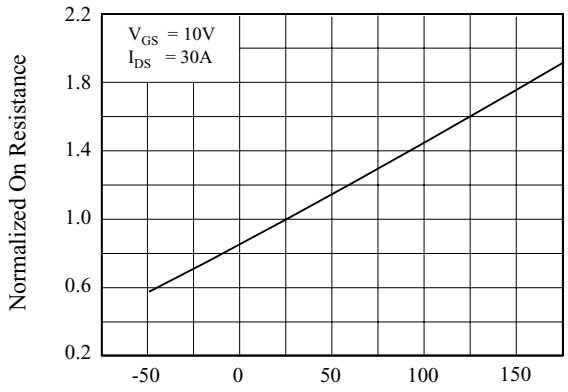


Fig 5. V_{th} - T_j

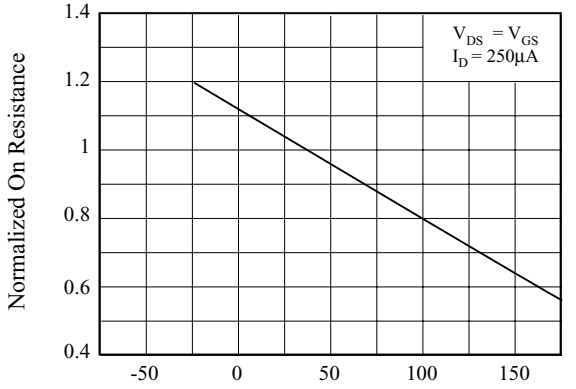


Fig 6. I_{DR} - V_{DSF}

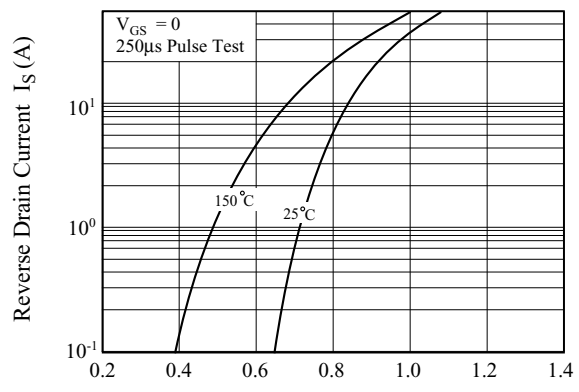


Fig 7. Q_g - V_{DS}

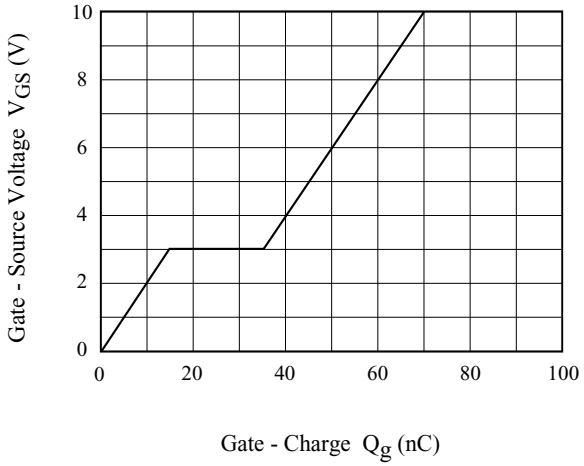


Fig 8. C - V_{DS}

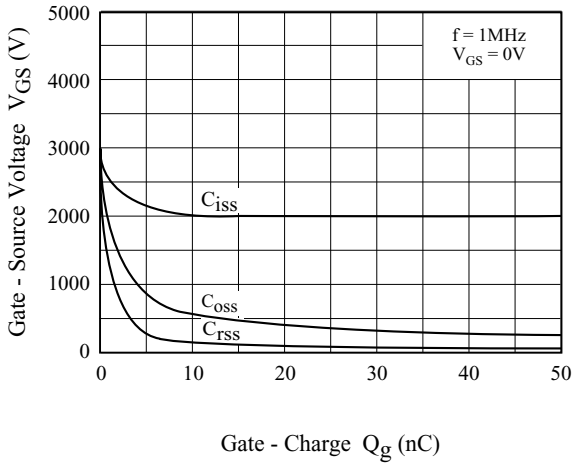


Fig 9. Safe Operation Area

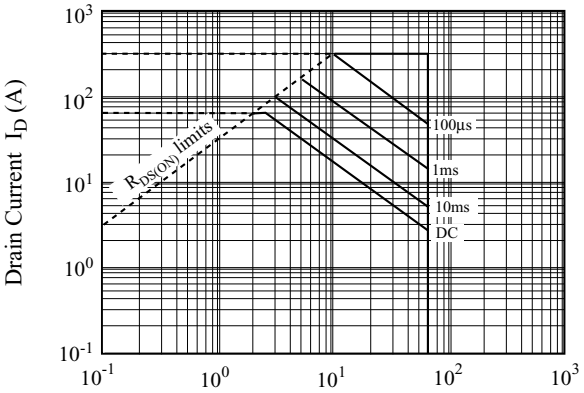


Fig 9. I_D - T_j

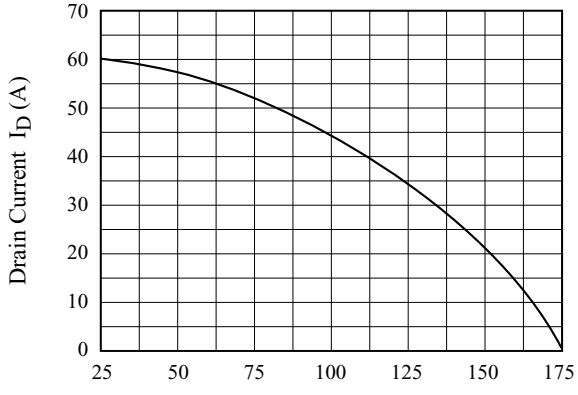
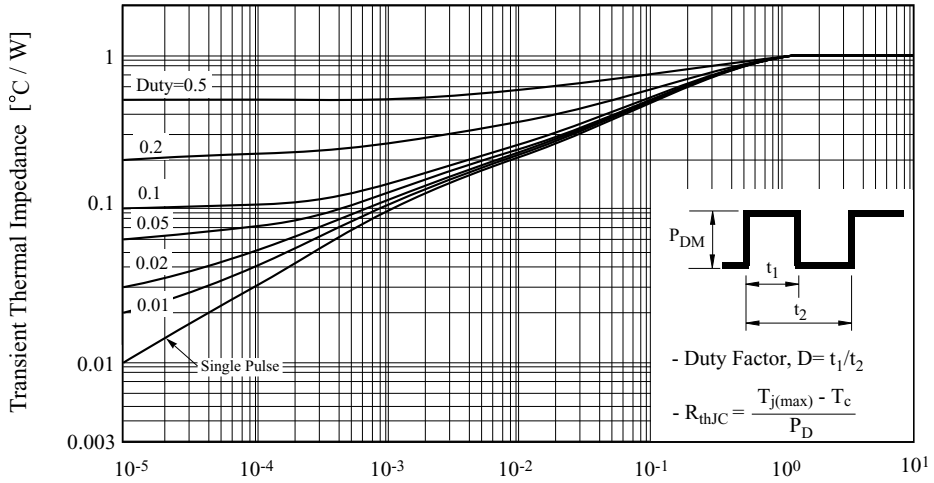
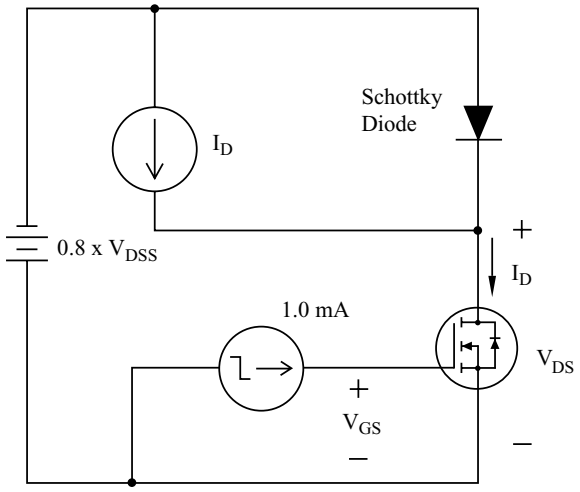
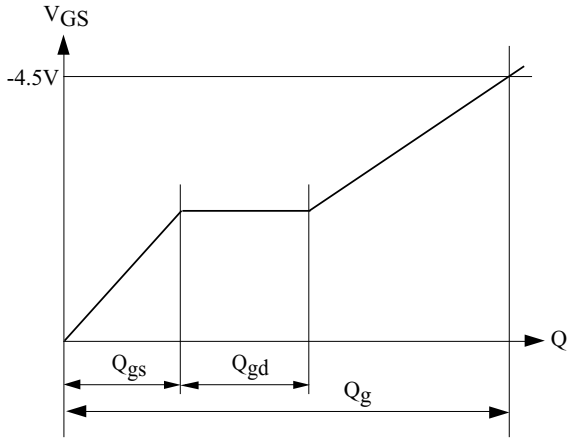


Fig 11. R_{th}

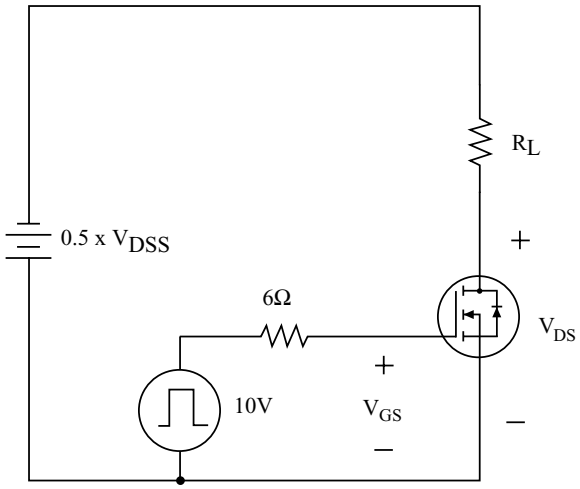


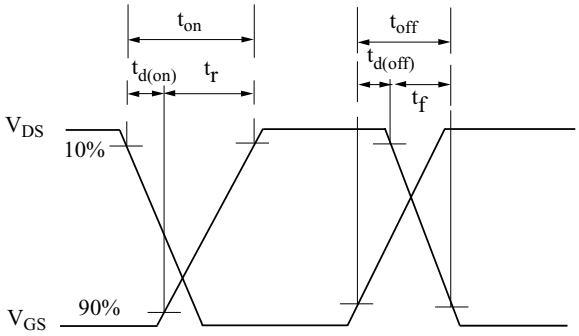
- Gate Charge



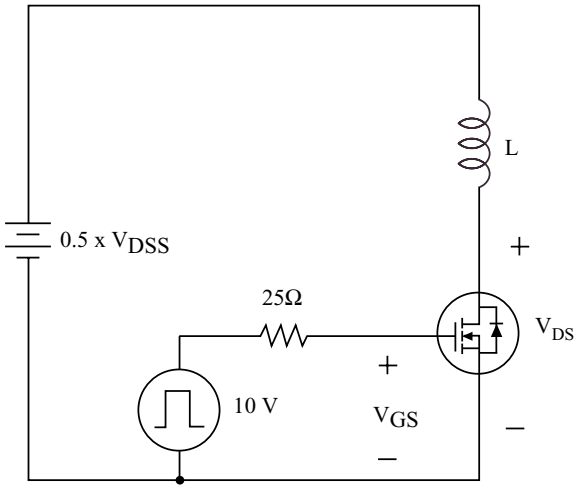


- Resistive Load Switching

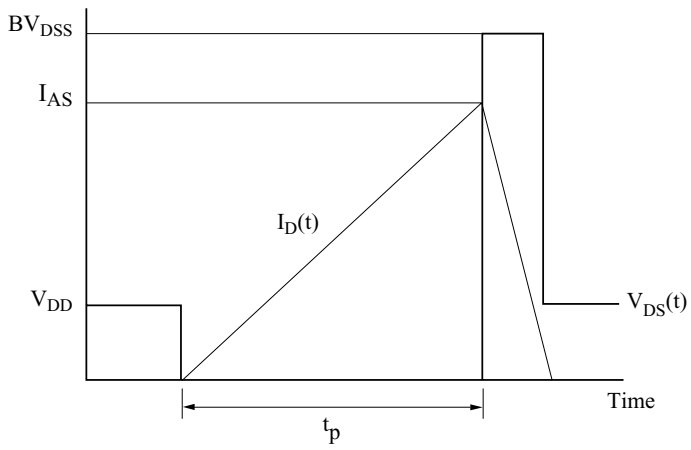
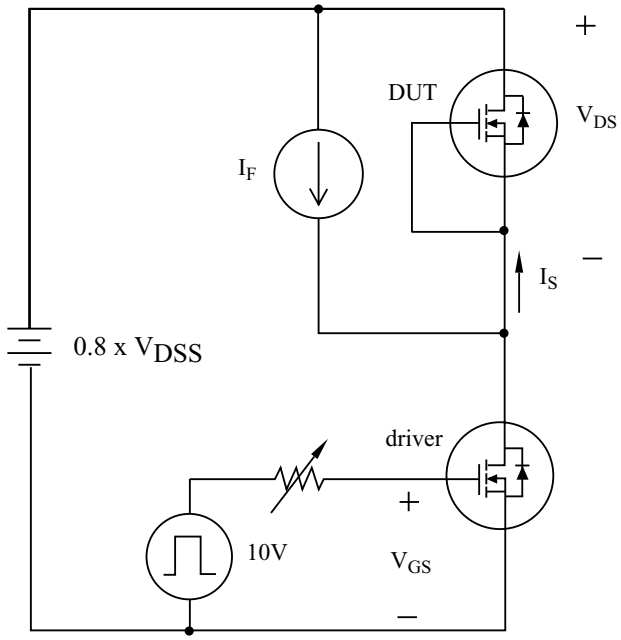
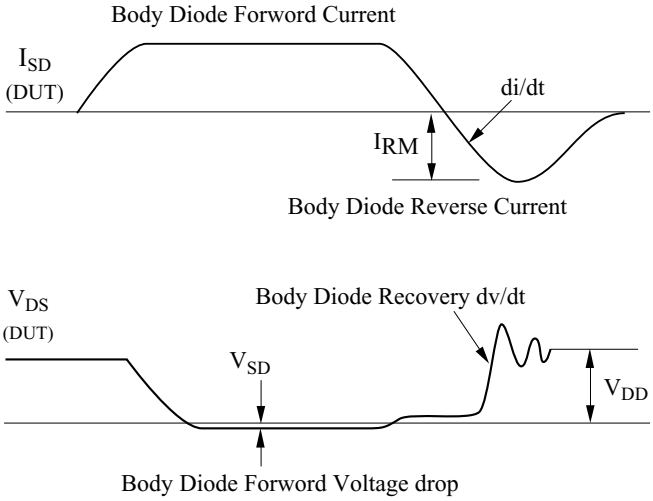




- Single Pulsed Avalanche Energy



$$E_{AS} = \frac{1}{2} LI_{AS}^2 \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$



- Source - Drain Diode Reverse Recovery and dv /dt