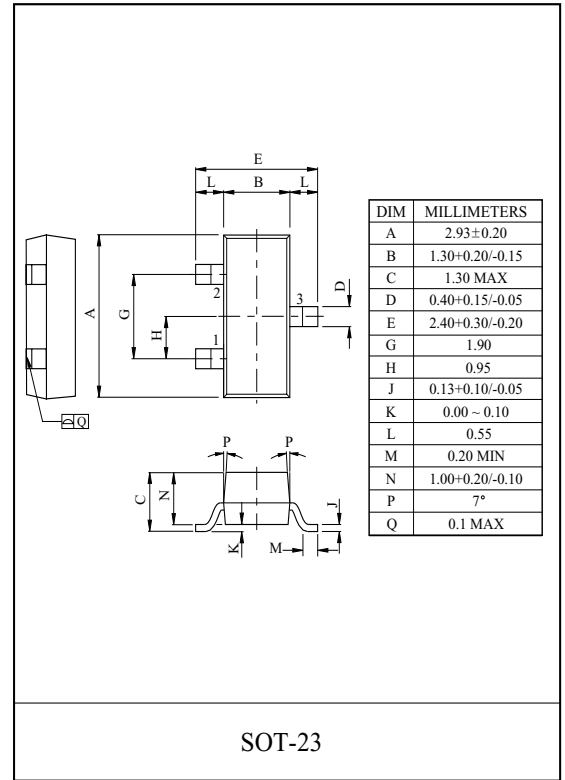


### General Description

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.

### FEATURES

- $V_{DSS}=20V$ ,  $I_D=3.6A$
- Drain-Source ON Resistance  
 $R_{DS(ON)}=45m$  (Max.) @  $V_{GS}=4.5V$   
 $R_{DS(ON)}=65m$  (Max.) @  $V_{GS}=2.5V$
- Super Hige Dense Cell Design

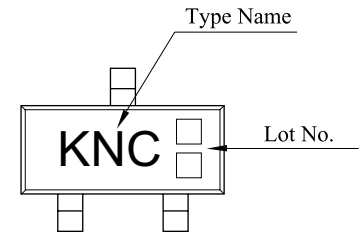


### MAXIMUM RATING (Ta=25 °C)

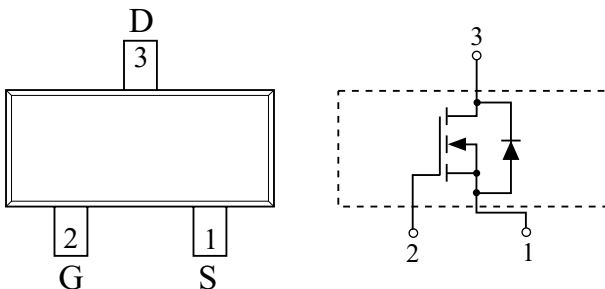
CHARACTERISTIC		SYMBOL	N-Ch	UNIT
Drain-Source Voltage		$V_{DSS}$	20	V
Gate-Source Voltage		$V_{GSS}$	± 12	V
Drain Current	DC	$I_D$	3.6	A
	Pulsed	$I_{DP}$	14	
Drain-Source-Diode Forward Current		$I_S$	1.25	A
Drain Power Dissipation	$T_A=25$	$P_D$	1.25	W
	$T_A=70$		0.8	
Maximum Junction Temperature		$T_j$	150	
Storage Temperature Range		$T_{stg}$	-55 150	
Thermal Resistance, Junction to Ambient		$R_{thJA}$	100	/W

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

### Marking



### PIN CONNECTION (TOP VIEW)



# KMA3D6N20SA

## ELECTRICAL CHARACTERISTICS (Ta=25 °C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
<b>Static</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_{DS}=250\ \mu A, V_{GS}=0V,$	20	-	-	V
Drain Cut-off Current	$I_{DSS}$	$V_{GS}=0V, V_{DS}=16V$	-	-	1	$\mu A$
Gate Leakage Current	$I_{GSS}$	$V_{GS}=\pm 10V, V_{DS}=0V$	-	-	$\pm 100$	nA
Gate Threshold Voltage	$V_{th}$	$V_{DS}=V_{GS}, I_D=250\ \mu A$	0.6	0.9	1.5	V
Drain-Source ON Resistance	$R_{DS(ON)}^*$	$V_{GS}=4.5V, I_D=2.5A$	-	32	45	m
		$V_{GS}=2.5V, I_D=2A$	-	50	65	
On-State Drain Current	$I_{D(ON)}^*$	$V_{GS}=4.5V, V_{DS}=5V$	10	-	-	A
Forward Transconductance	$g_{fs}^*$	$V_{DS}=5V, I_D=3A$	-	8	-	S
<b>Dynamic</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=15V, V_{GS}=0V, f=1MHz,$	-	437	-	pF
Output Capacitance	$C_{oss}$		-	87	-	
Reverse Transfer Capacitance	$C_{rss}$		-	51	-	
Total Gate Charge	$Q_g^*$	$V_{DS}=10V, V_{GS}=4.5V, I_D=3.5A$	-	6.6	-	nC
Gate-Source Charge	$Q_{gs}^*$		-	0.8	-	
Gate-Drain Charge	$Q_{gd}^*$		-	1.85	-	
Turn-On Delay Time	$t_{d(on)}^*$	$V_{DD}=10V, V_{GS}=4.5V$ $I_D=1A, R_G=6\ \Omega$ (NOTE 1)	-	13	-	ns
Turn-On Rise Time	$t_r^*$		-	19	-	
Turn-Off Delay Time	$t_{d(off)}^*$		-	85	-	
Turn-Off Fall Time	$t_f^*$		-	47	-	
<b>Source-Drain Diode Ratings</b>						
Source-Drain Forward Voltage	$V_{SDF}^*$	$V_{GS}=0V, I_{DR}=1.25A$	-	0.81	1.2	V
NOTE 1) * : Pulse Test : Pulse width <300 $\mu s$ , Duty cycle < 2%						

# KMA3D6N20SA

Fig1.  $I_D - V_{DS}$

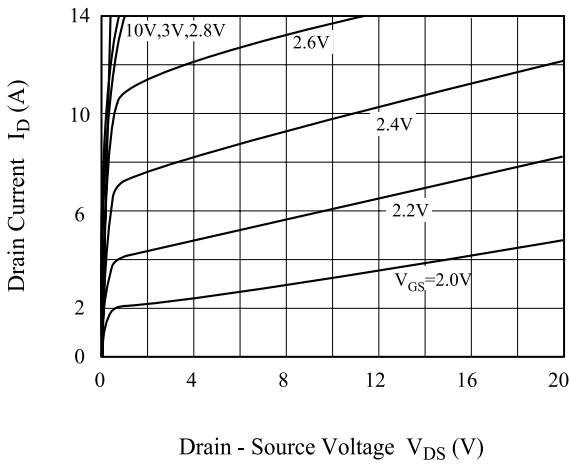


Fig2.  $R_{DS(on)} - I_D$

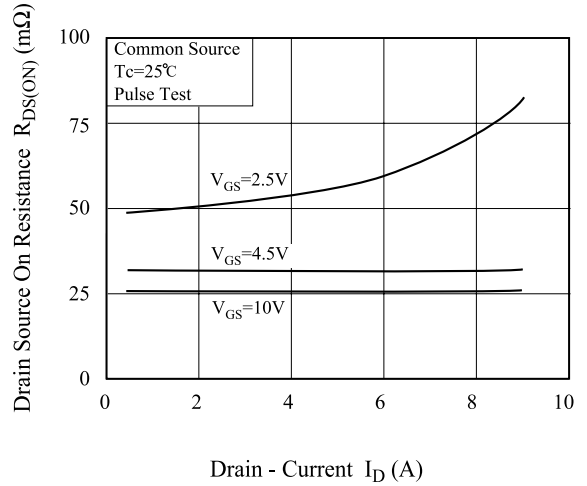


Fig3.  $I_D - V_{GS}$

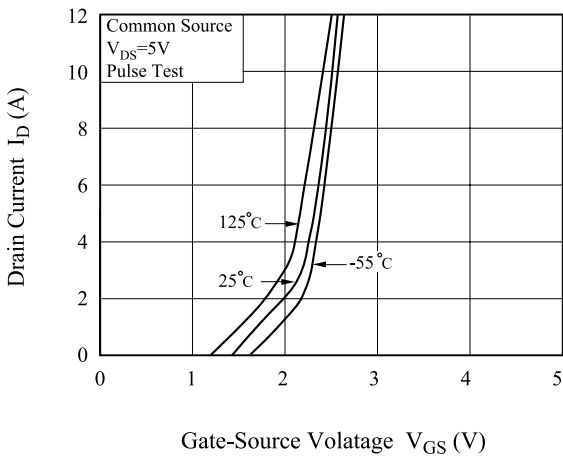


Fig4.  $R_{DS(on)} - T_j$

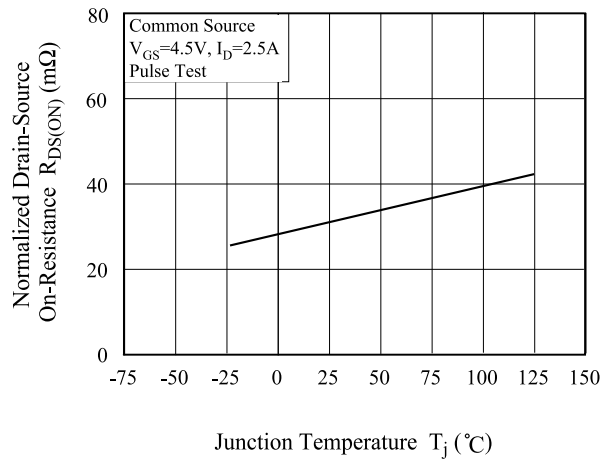


Fig5.  $V_{th} - T_j$

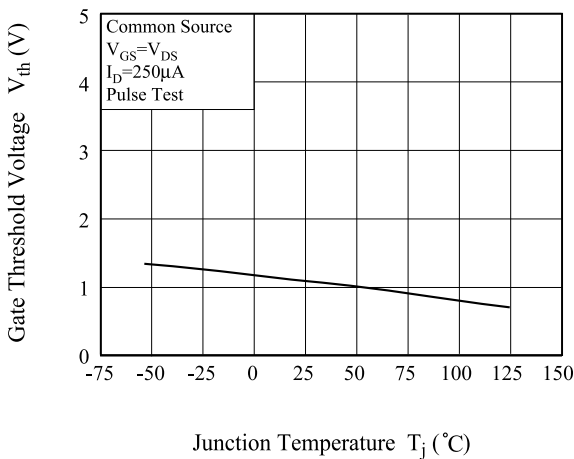
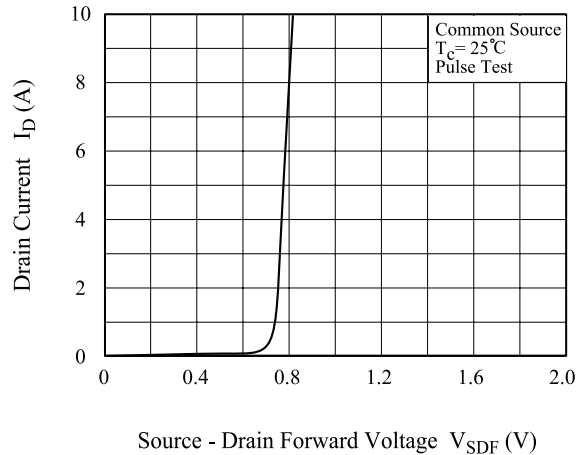


Fig6.  $I_S - V_{SDF}$



# KMA3D6N20SA

Fig7. Transient Thermal Response Curve

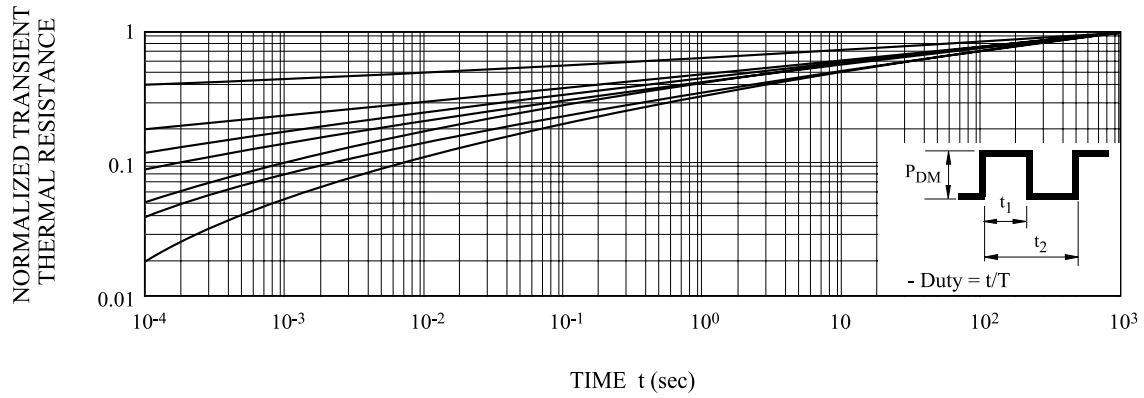
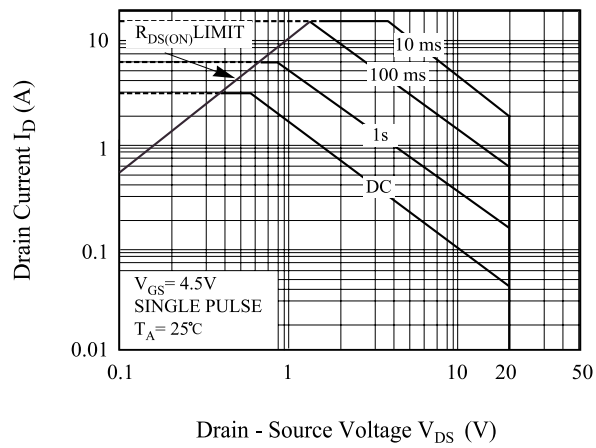


Fig8. Safe Operation Area



# KMA3D6N20SA

Fig9. Gate Charge Circuit and Wave Form

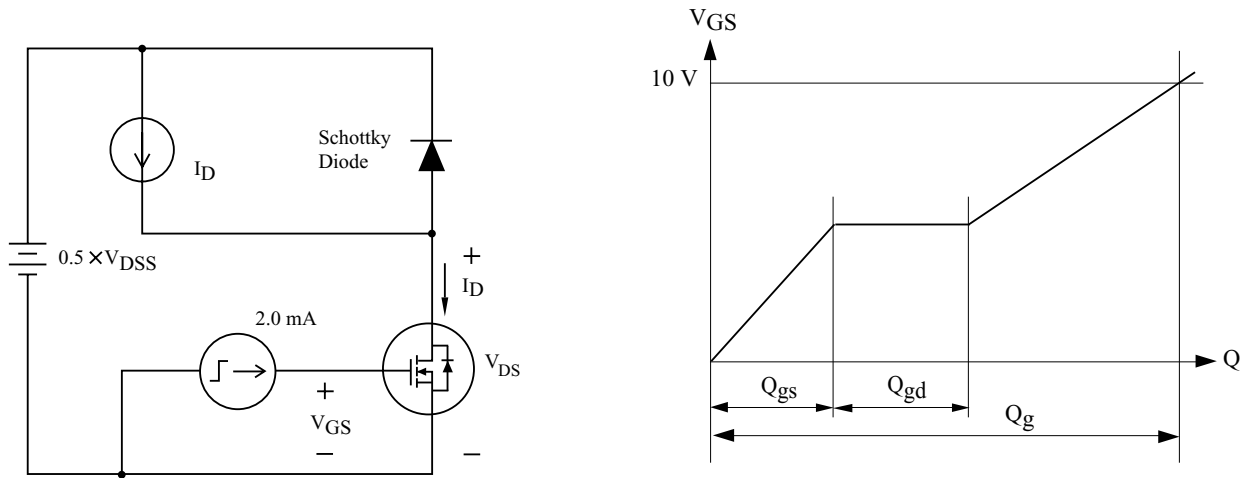


Fig10. Resistive Load Switching

