

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 DC/DC Converter.

FEATURES

- $V_{DSS}=30V$, $I_D=79A$.
- Low Drain to Source On-state Resistance.
 - : $R_{DS(ON)}=4.8m$ (Max.) @ $V_{GS}=10V$
 - : $R_{DS(ON)}=6.5m$ (Max.) @ $V_{GS}=4.5V$

MAXIMUM RATING (Ta=25 Unless otherwise Noted)

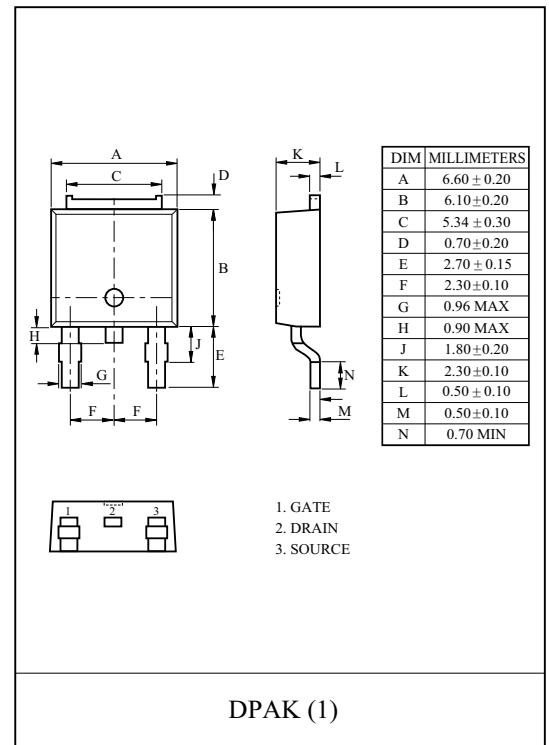
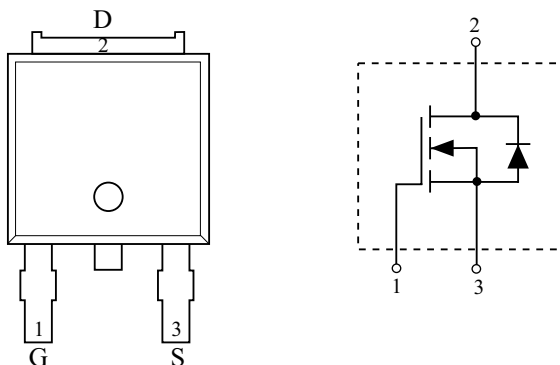
CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain to Source Voltage	V_{DSS}	30	V
Gate to Source Voltage	V_{GSS}	± 20	V
Drain Current	DC@ $T_C=25$ (Note1)	I_D	84
	Pulsed (Note2)	I_{DP}	336
Single Pulsed Avalanche Energy	(Note3)	E_{AS}	124
Drain Power Dissipation	@ $T_C=25$ (Note1)	P_D	60
	@ $T_a=25$ (Note2)		3.8
Maximum Junction Temperature	T_j	150	
Storage Temperature Range	T_{stg}	-55 150	
Thermal Resistance, Junction to Case	(Note1) R_{thJC}	2.1	/W
Thermal Resistance, Junction to Ambient	(Note2) R_{thJA}	40	/W

Note 1) R_{thJC} means that the infinite heat sink is mounted.

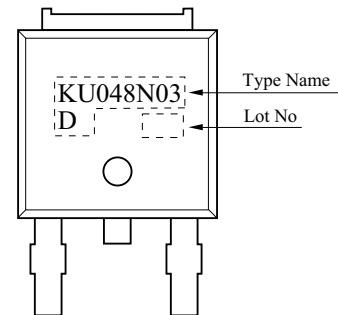
Note 2) Surface Mounted on 1 × 1 Pad of 2 oz copper.

Note 3) $L=18 \mu H$, $I_{AS}=84A$, $V_{DD}=15V$, $V_{GS}=10V$, Starting $T_j=25$

PIN CONNECTION (TOP VIEW)



Marking



KU048N03D

ELECTRICAL CHARACTERISTICS (Ta=25)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Static							
Drain to Source Breakdown Voltage		BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
Drain Cut-off Current		I_{DSS}	$V_{GS}=0V, V_{DS}=30V$	-	-	1	μA
Gate to Source Leakage Current		I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Gate to Source Threshold Voltage		V_{th}	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	-	3.0	V
Drain to Source On Resistance		$R_{DS(ON)}$	$V_{GS}=10V, I_D=30A$ (Note4)	-	3.0	4.8	m
			$V_{GS}=4.5V, I_D=30A$ (Note4)	-	4.0	6.5	
Forward Transconductance		g_{fs}	$V_{DS}=5V, I_D=30A$ (Note4)	-	75	-	S
Dynamic							
Input Capacitance		C_{iss}	$V_{DS}=15V, f=1MHz, V_{GS}=0V$	-	2772	-	pF
Output Capacitance		C_{oss}		-	550	-	
Reverse Transfer Capacitance		C_{rss}		-	398	-	
Gate Resistance		R_g	$f=1MHz$	-	3.5	-	
Total Gate Charge	$V_{GS}=10V$	Q_g	$V_{DS}=15V, V_{GS}=10V, I_D=30A$ (Note4)	-	64.5	-	nC
	$V_{GS}=4.5V$	Q_g		-	32.2	-	
Gate to Source Charge		Q_{gs}		-	8.2	-	
Gate to Drain Charge		Q_{gd}		-	14.7	-	
Turn-On Delay Time		$t_{d(on)}$		$V_{DD}=15V, V_{GS}=10V$ $I_D=30A, R_G=1.6$ (Note4)	-	11.6	
Turn-On Rise Time		t_r	-		16.4	-	
Turn-Off Delay Time		$t_{d(off)}$	-		57.8	-	
Turn-Off Fall Time		t_f	-		19.8	-	
Source to Drain Diode Ratings							
Source to Drain Forward Voltage		V_{SD}	$V_{GS}=0V, I_S=30A$ (Note4)	-	0.8	1.2	V
Reverse Recovery time		t_{rr}	$I_S=30A, dI/dt=100A/\mu s$	-	26.7	-	ns
Reverse Recovered charge		Q_{rr}	$I_S=30A, dI/dt=100A/\mu s$	-	17.6	-	nC

Note 4) Pulse Test : Pulse width <300 μs , Duty cycle < 2%

KU048N03D

Fig1. $I_D - V_{DS}$

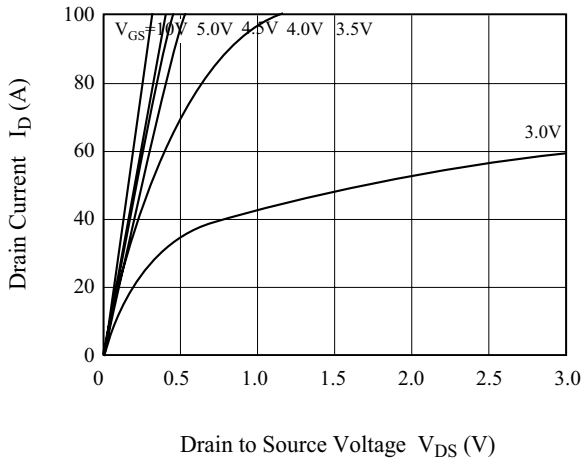


Fig2. $R_{DS(on)} - I_D$

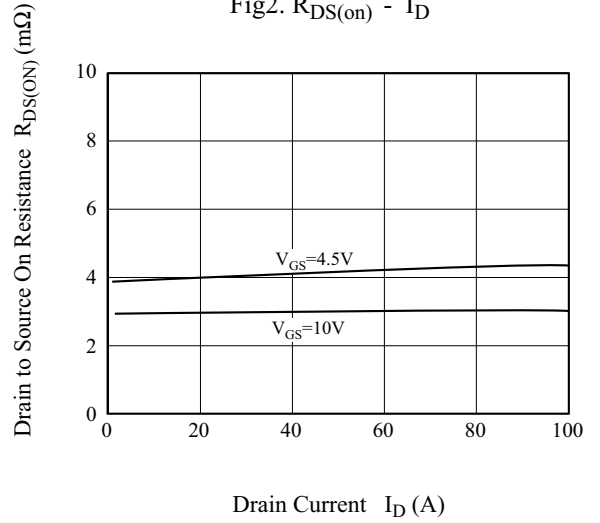


Fig3. $I_D - V_{GS}$

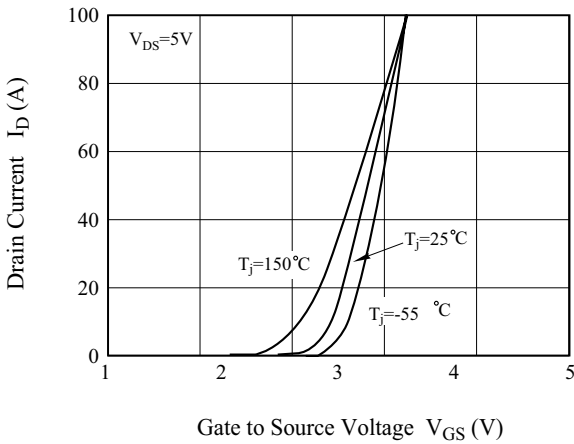


Fig4. $R_{DS(ON)} - T_j$

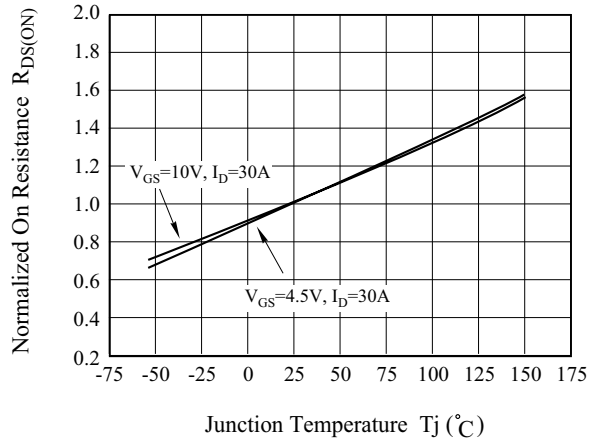


Fig5. $V_{th} - T_j$

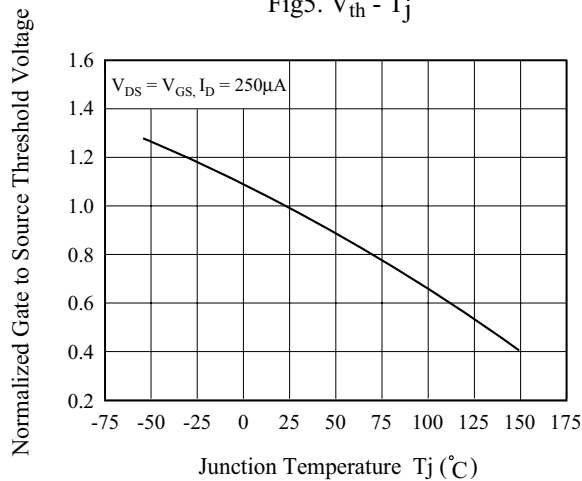
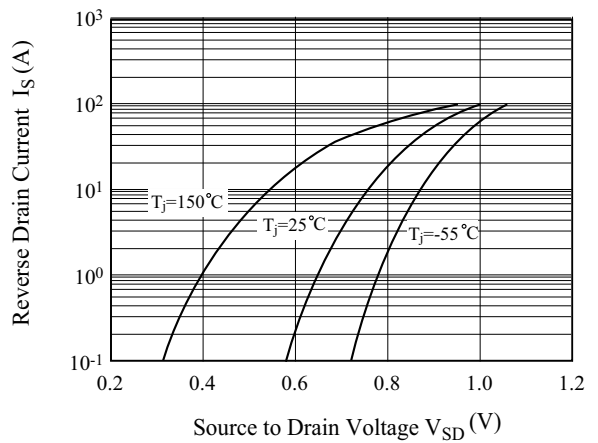


Fig6. $I_S - V_{SD}$



KU048N03D

Fig7. $R_{DS(ON)} - V_{GS}$

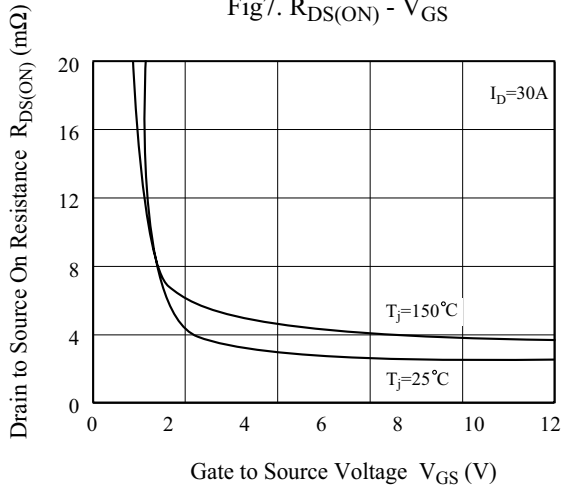


Fig8. $C - V_{DS}$

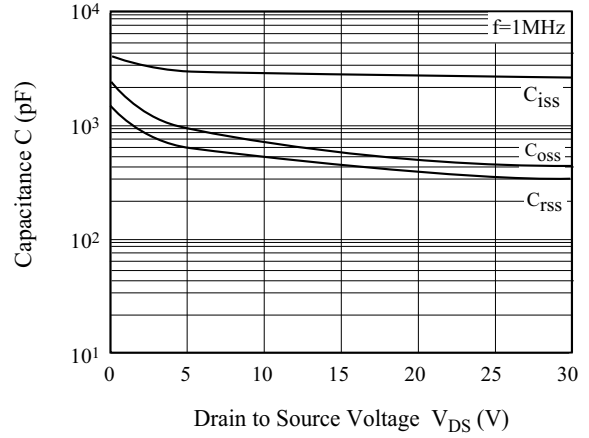


Fig9. $Q_g - V_{GS}$

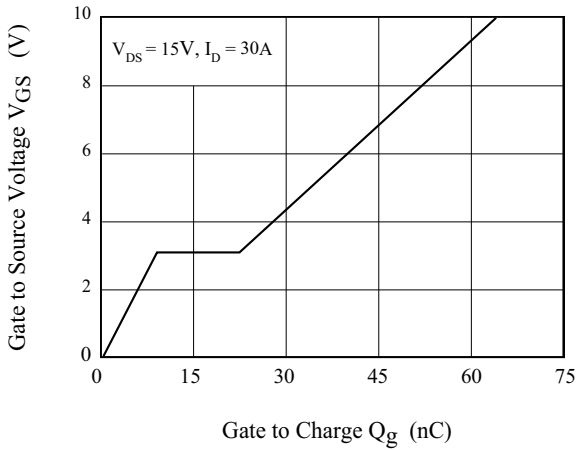


Fig10. Safe Operation Area

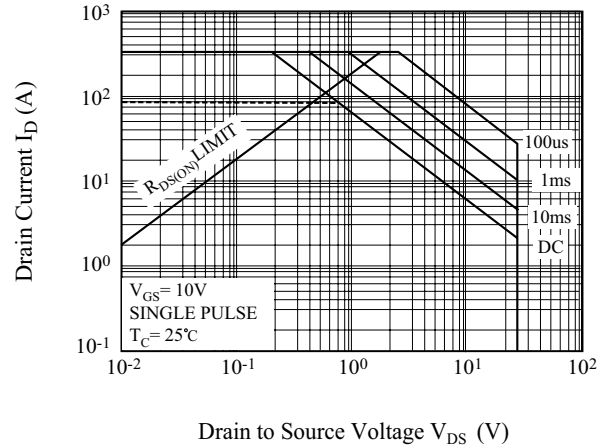


Fig11. Transient Thermal Response Curve

