KU054N03D

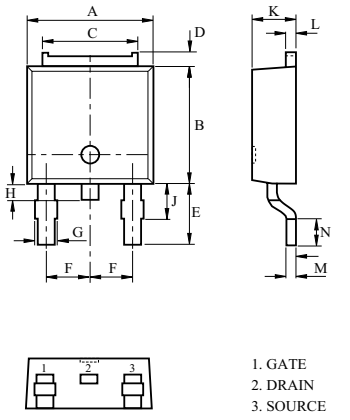
N-Ch Trench MOSFET

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.
  : $R_{DS(ON)}$=5.4mΩ(Max.) @ V_{GS}=10V
  : $R_{DS(ON)}$=10.1mΩ(Max.) @ V_{GS}=4.5V



DIM	MILLIMETERS
A	6.60 ± 0.20
B	6.10 ± 0.20
C	5.34 ± 0.30
D	0.70 ± 0.20
E	2.70 ± 0.15
F	2.30 ± 0.10
G	0.96 MAX
H	0.90 MAX
J	1.80 ± 0.20
K	2.30 ± 0.10
L	0.50 ± 0.10
M	0.50 ± 0.10
N	0.70 MIN

1. GATE
2. DRAIN
3. SOURCE

DPAK (1)

MAXIMUM RATING (Ta=25℃ Unless otherwise Noted)

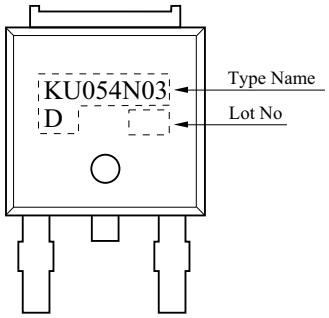
CHARACTERISTIC			SYMBOL	RATING	UNIT
Drain to Source Voltage			V_{DSS}	30	V
Gate to Source Voltage			V_{GSS}	±20	V
Drain Current	DC@T_C=25℃	(Note1)	I_D	79	A
	Pulsed	(Note2)	I_{DP}	316	
Single Pulsed Avalanche Energy		(Note3)	E_{AS}	111	mJ
Drain Power Dissipation	@T_C=25℃	(Note1)	P_D	48	W
	@Ta=25℃	(Note2)		3.8	
Maximum Junction Temperature			T_j	150	℃
Storage Temperature Range			T_{stg}	-55 150	℃
Thermal Resistance, Junction to Case		(Note1)	R_{thJC}	2.6	℃/W
Thermal Resistance, Junction to Ambient		(Note2)	R_{thJA}	40	℃/W

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

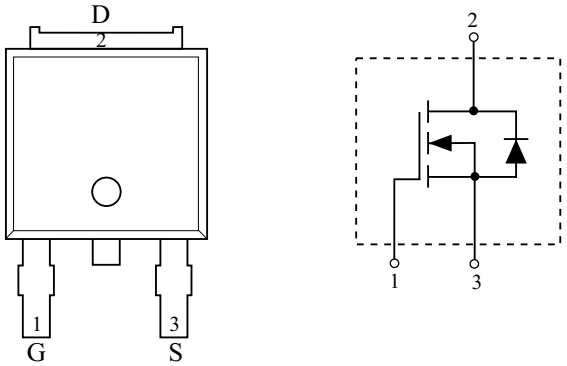
Note 2) Surface Mounted on 1 ″×1 ″Pad of 2 oz copper.

Note 3) L=18.0 μH, I_{AS}=79A, V_{DD}=15V, V_{GS}=10V, Starting T_j=25℃

Marking



PIN CONNECTION (TOP VIEW)



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 μA	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}=±20V, V_{DS}=0V	-	-	±100	nA
Gate to Source Threshold Voltage		V_{th}	V_{DS}=V_{GS}, I_D=250 μA	1.0	-	3.0	V
Drain to Source On Resistance		$R_{DS(ON)}$	V_{GS}=10V, I_D=30A (Note4)	-	4.5	5.4	mΩ
			V_{GS}=4.5V, I_D=30A (Note4)	-	8.4	10.1	
Forward Transconductance		g_{fs}	V_{DS}=5V, I_D=30A (Note4)	-	69	-	S
Dynamic							
Input Capacitance		C_{iss}	V_{DS}=15V, f=1MHz, V_{GS}=0V	-	1751	-	pF
Ouput Capacitance		C_{oss}		-	350	-	
Reverse Transfer Capacitance		C_{rss}		-	253	-	
Gate Resistance		R_g	f=1MHz	-	2.8	-	Ω
Total Gate Charge	V_{GS}=10V	Q_g	V_{DS}=15V, V_{GS}=10V, I_D=30A (Note4)	-	39.7	-	nC
	V_{GS}=4.5V	Q_g		-	20.1	-	
Gate to Source Charge		Q_{gs}		-	7.1	-	
Gate to Drain Charge		Q_{gd}		-	8.4	-	
Turn-On Delay Time		$t_{d(on)}$	V_{DD}=15V, V_{GS}=10V, I_D=30A, R_G=1.6Ω (Note4)	-	10.6	-	ns
Turn-On Rise Time		t_r		-	11.6	-	
Turn-Off Delay Time		$t_{d(off)}$		-	30.2	-	
Turn-Off Fall Time		t_f		-	10.2	-	
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/μs	-	23.5	-	ns
Reverse Recovered charge		Q_{rr}	I_S=30A, dI/dt=100A/μs	-	9.7	-	nC

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

Fig1. I_D - V_{DS}

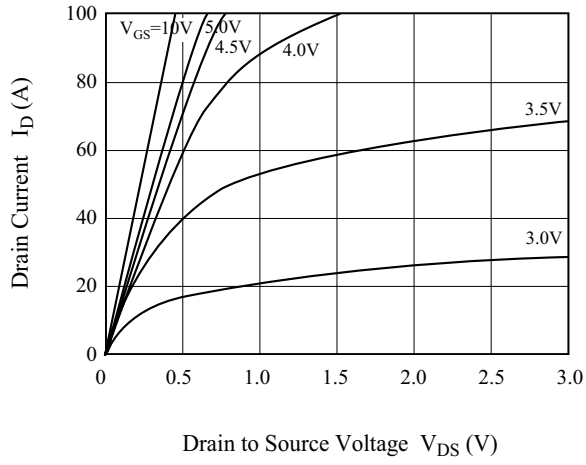


Fig2. $R_{DS(on)}$ - I_D

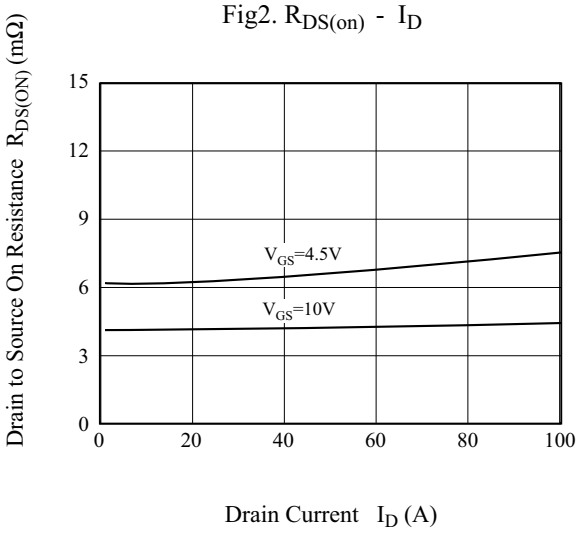


Fig3. I_D - V_{GS}

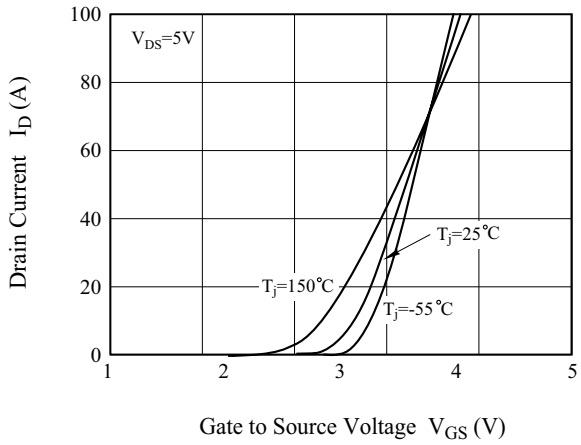


Fig4. $R_{DS(ON)}$ - T_j

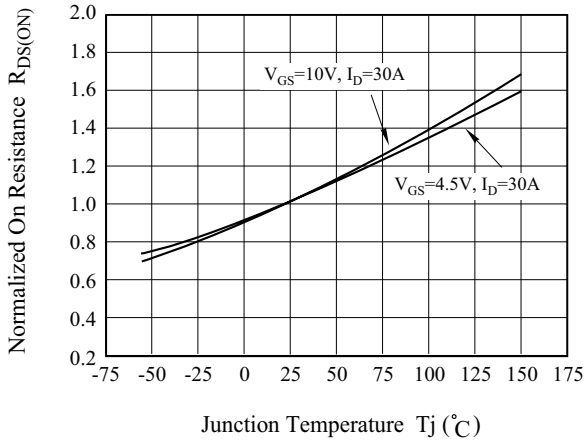


Fig5. V_{th} - T_j

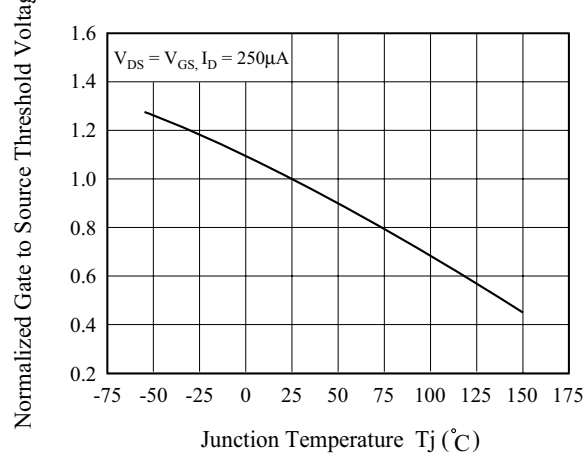


Fig6. I_S - V_{SD}

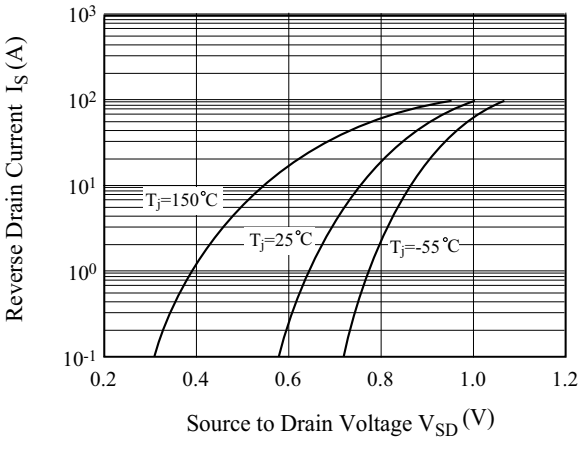


Fig7. $R_{DS(ON)}$ - V_{GS}

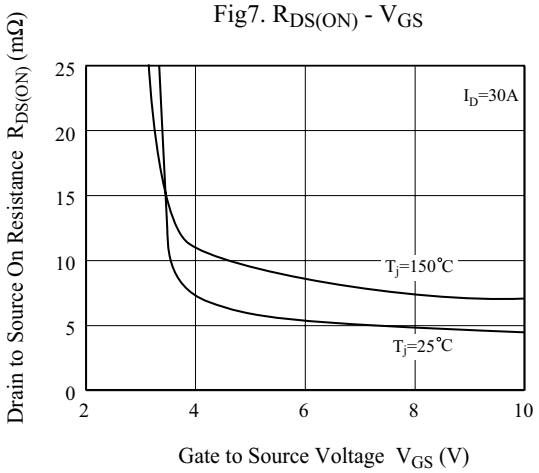


Fig8. C - V_{DS}

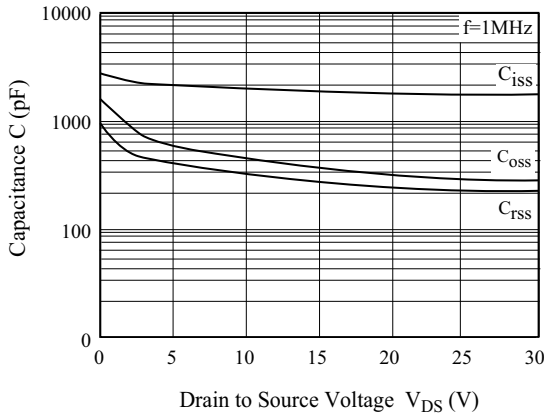


Fig9. Q_g - V_{GS}

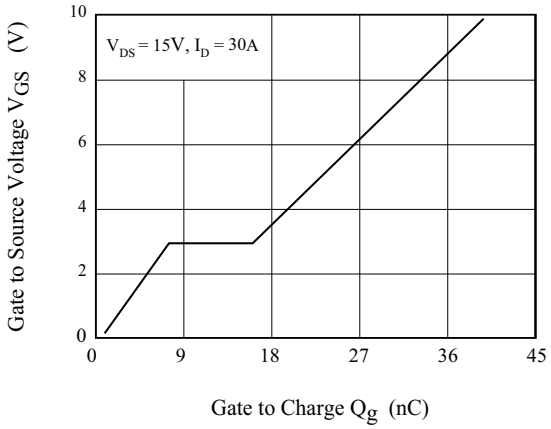


Fig10. Safe Operation Area

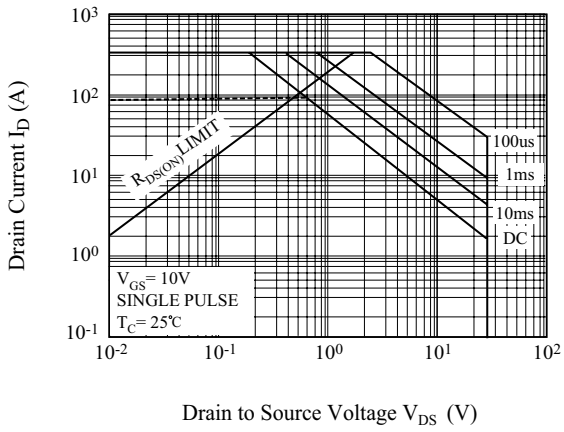


Fig11. Transient Thermal Response Curve