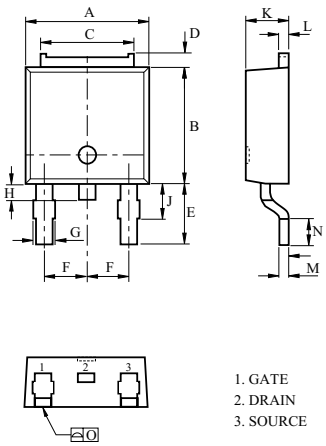
General Description

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 Back-light Inverter and Power Supply.

FEATURES

- V_{DSS}=40V, I_D=54A.
- Low Drain-Source ON Resistance.
  : $R_{DS(ON)}$=8.5mΩ(Max.) @ V_{GS}=10V
  : $R_{DS(ON)}$=11mΩ(Max.) @ V_{GS}=4.5V
- Super High Dense Cell Design.
- High Power and Current Handling Capability.



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
O	0.1 MAX

1. GATE
2. DRAIN
3. SOURCE

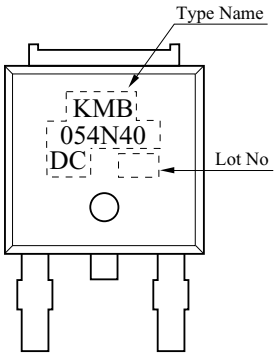
DPAK (1)

MAXIMUM RATING (Ta=25℃ Unless otherwise Noted)

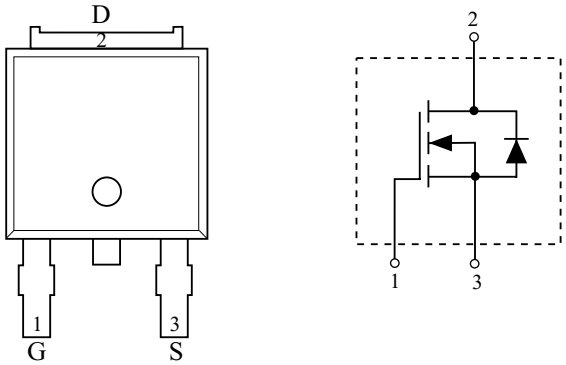
CHARACTERISTIC		SYMBOL	N-Ch	UNIT
Drain-Source Voltage		V_{DSS}	40	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current	DC@T_C=25℃ (Note1)	I_D	54	A
	Pulsed (Note2)	I_{DP}	200	
Drain-Source-Diode Forward Current		I_S*	100	A
Drain Power Dissipation	@T_C=25℃ (Note1)	P_D	45	W
	@Ta=25℃ (Note2)		3.1	
Maximum Junction Temperature		T_j	150	℃
Storage Temperature Range		T_{stg}	-55 150	℃
Thermal Resistance, Junction to Case (Note1)		R_{thJC}	2.8	℃/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.

Marking



PIN CONNECTION (TOP VIEW)



ELECTRICAL CHARACTERISTICS (Ta=25℃)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Static							
Drain-Source Breakdown Voltage		BV_{DSS}	V_{GS}=0V, I_D=250 μA	40	-	-	V
Drain Cut-off Current		I_{DSS}	V_{GS}=0V, V_{DS}=32V	-	-	1	μA
Gate Leakage Current		I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage		V_{th}	V_{DS}=V_{GS}, I_D=250 μA	1.7	-	2.6	V
Drain-Source ON Resistance		$R_{DS(ON)*}$	V_{GS}=10V, I_D=14A	-	6.5	8.5	mΩ
			V_{GS}=4.5V, I_D=11A	-	8.5	11	
			V_{GS}=10V, I_D=14A, T_j=125℃	-	10.4	14	
Forward Transconductance		g_{fs*}	V_{DS}=10V, I_D=20A	-	58	-	S
Dynamic							
Input Capacitance		C_{iss}	V_{DS}=20V, f=1MHz, V_{GS}=0V	-	1280	-	pF
Ouput Capacitance		C_{oss}		-	250	-	
Reverse Transfer Capacitance		C_{rss}		-	125	-	
Total Gate Charge	V_{GS}=10V	Q_g*	V_{DS}=20V, V_{GS}=10V, I_D=14A	-	25.4	-	nC
	V_{GS}=5V	Q_g*		-	13.8	-	
Gate-Source Charge		Q_{gs}*		-	5.7	-	
Gate-Drain Charge		Q_{gd}*		-	5.4	-	
Turn-On Delay Time		$t_{d(on)}$*	V_{DD}=20V, V_{GS}=10V, I_D=1A, R_G=6Ω	-	19	-	ns
Turn-On Rise Time		t_r*		-	16	-	
Turn-Off Delay Time		$t_{d(off)}$*		-	60	-	
Turn-Off Fall Time		t_f*		-	14	-	
Source-Drain Diode Ratings							
Source-Drain Forward Voltage		V_{SDF}*	V_{GS}=0V, I_S=14A	-	0.8	1.2	V
Note>* Pulse Test : Pulse width <300μs , Duty cycle < 2%							

Fig1. I_D - V_{DS}

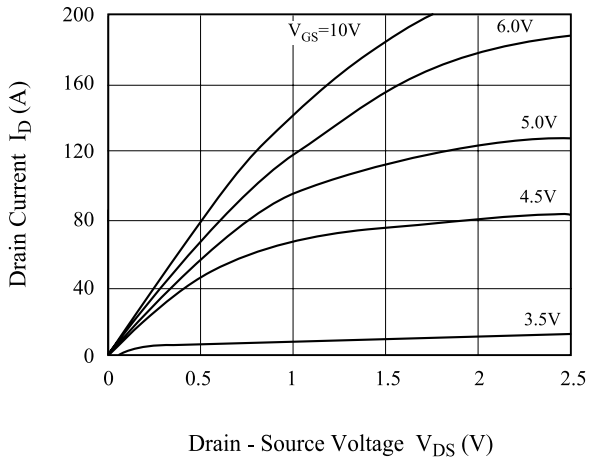


Fig2. $R_{DS(ON)}$-I_D

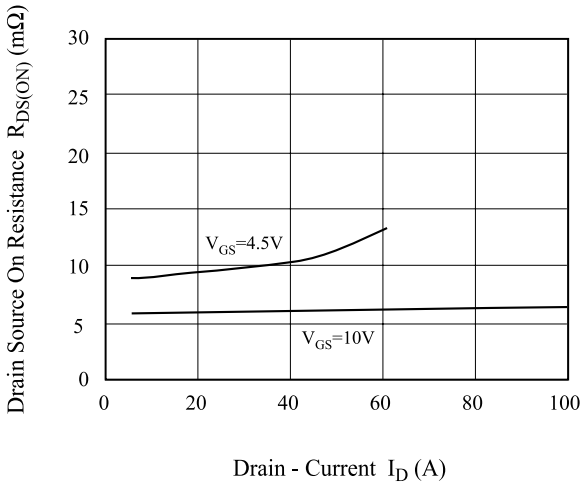


Fig3. I_D - V_{GS}

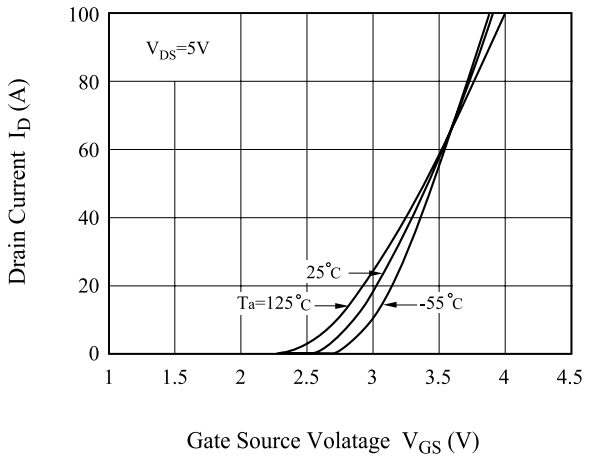


Fig4. $R_{DS(on)}$ - T_j

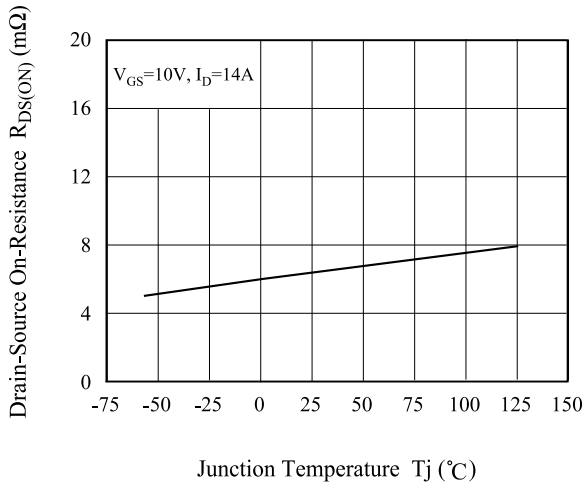


Fig5. V_{th} - T_j

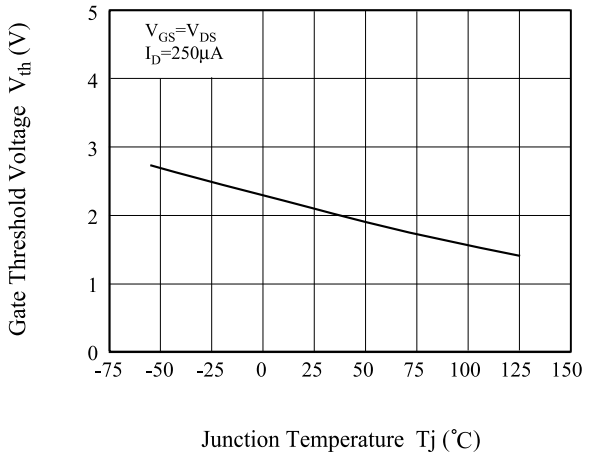


Fig6. I_S - V_{SDF}

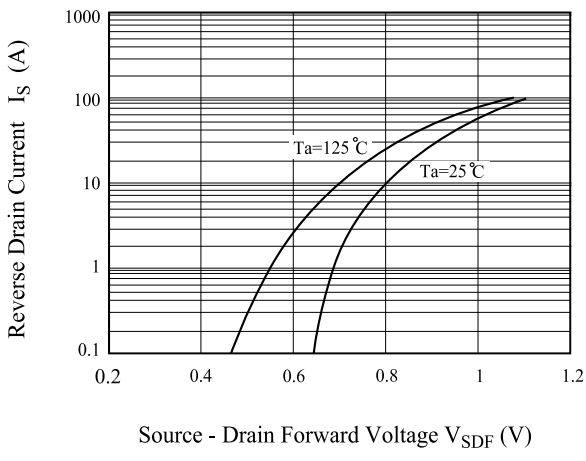


Fig 7. V_{GS} - Q_g

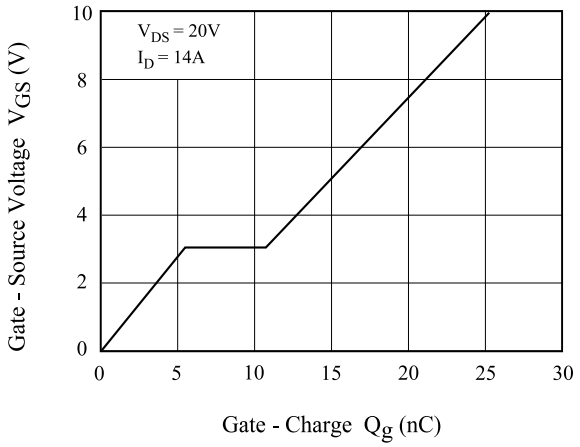


Fig 8. C - V_{DS}

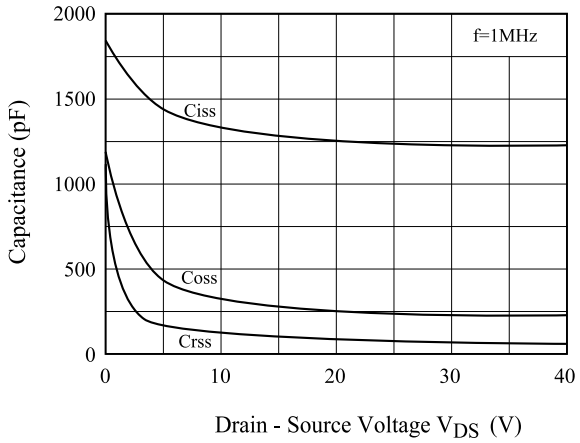


Fig9. Safe Operation Area

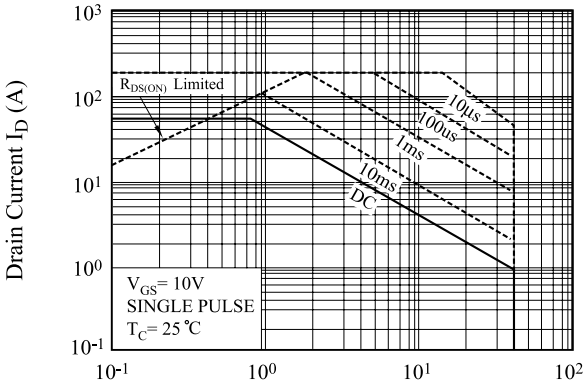


Fig10. Transient Thermal Response Curve

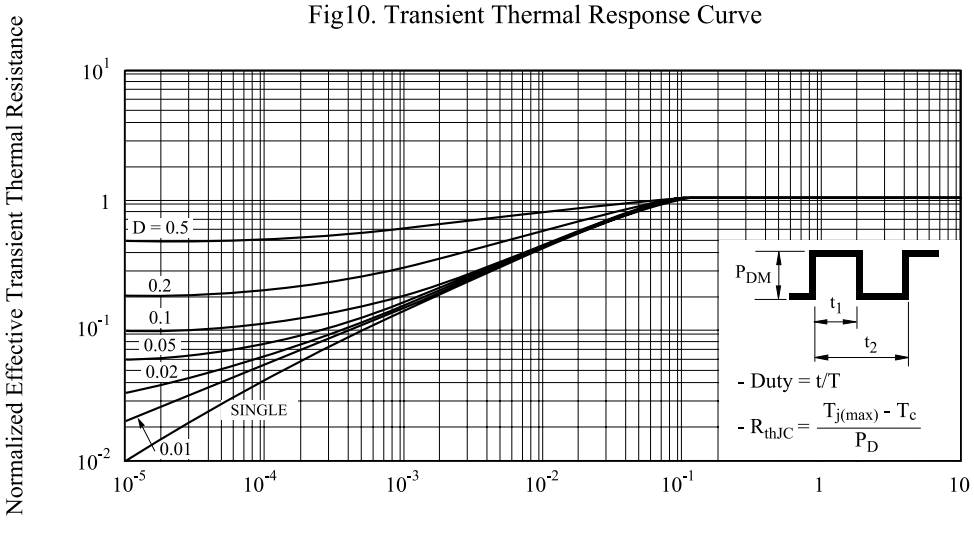
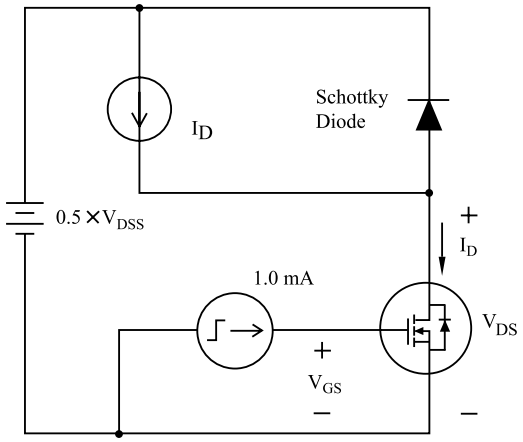


Fig11. Gate Charge Circuit and Wave Form



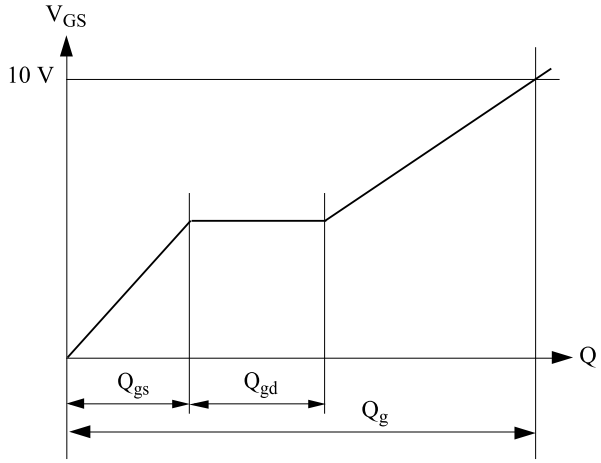


Fig12. Resistive Load Switching