

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.
 - : $R_{DS(ON)}=8.5m\ \Omega$ (Max.) @ $V_{GS}=10V$
 - : $R_{DS(ON)}=11m\ \Omega$ (Max.) @ $V_{GS}=4.5V$
- Super High Dense Cell Design.
- High Power and Current Handling Capability.

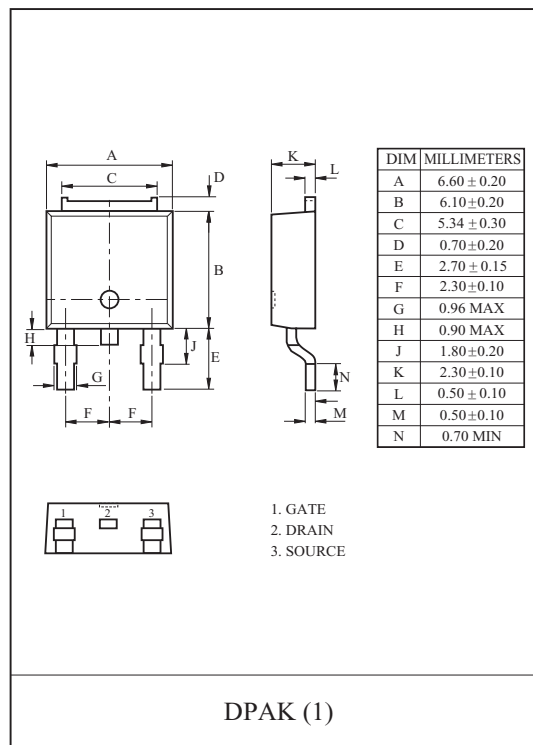
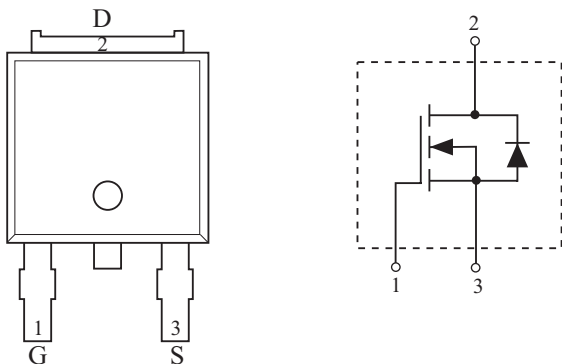
MAXIMUM RATING (Ta=25 °C Unless otherwise Noted)

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

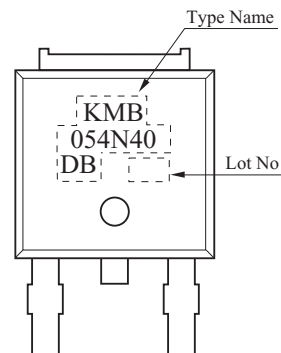
Note 1) R_{thJC} means that the infinite heat sink is mounted.

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

PIN CONNECTION (TOP VIEW)



Marking



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ELECTRICAL CHARACTERISTICS (Ta=25℃)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Static							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V, I _D =250μA	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 =250μA	1	1.9	3	V
Drain-Source ON Resistance		R _{DS(ON)*}	V _{GS} =10V, I _D =14A	-	6.5	8.5	m Ω
			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 =6 Ω	-	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 <300 μs , Duty cycle < 2%							

Fig1. $I_D - V_{DS}$

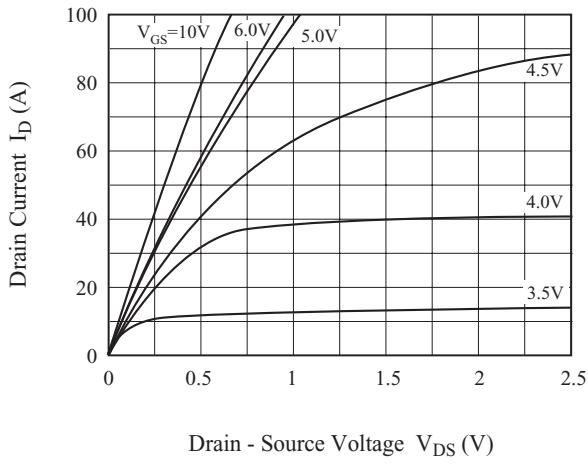


Fig2. $R_{DS(ON)} - I_D$

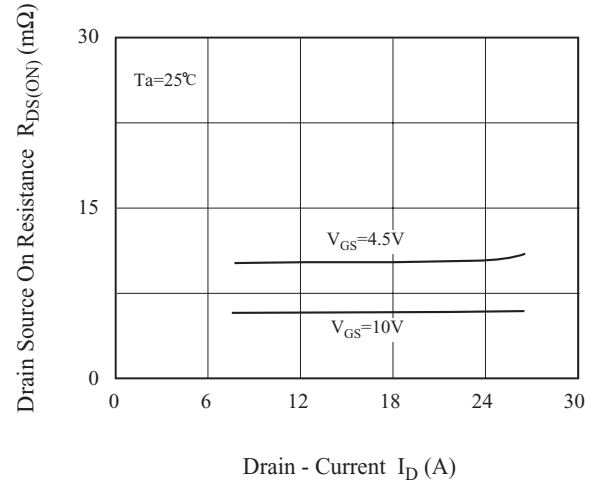


Fig3. $I_D - V_{GS}$

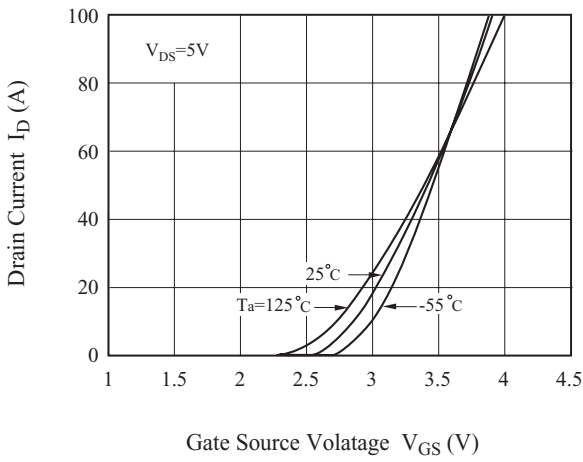


Fig4. $R_{DS(on)} - T_j$

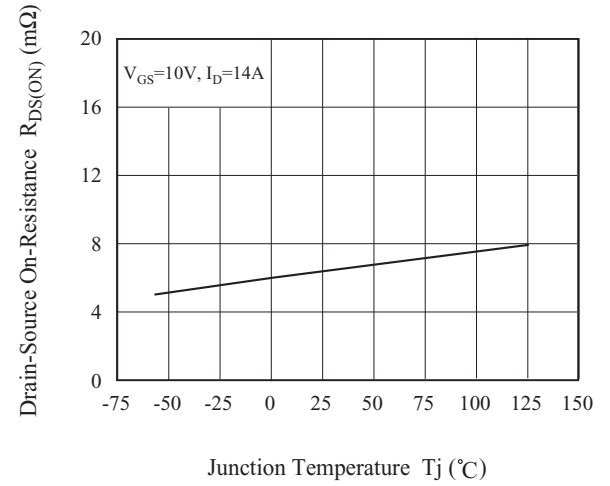


Fig5. $V_{th} - T_j$

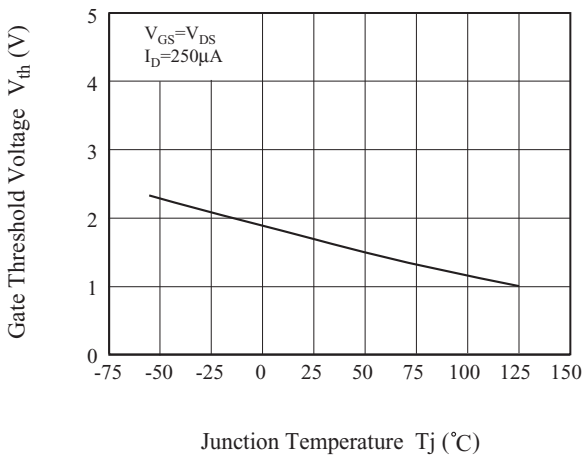
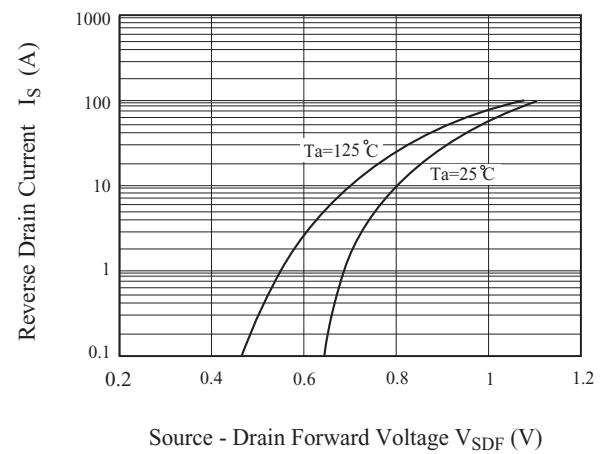


Fig6. $I_S - V_{SDF}$



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Fig 7. $V_{GS} - Q_g$

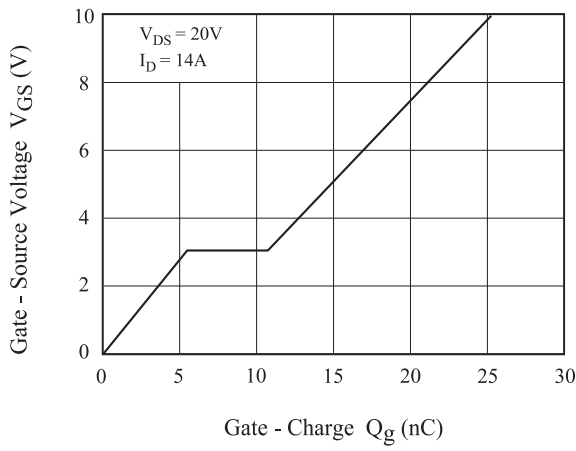


Fig 8. C - V_{DS}

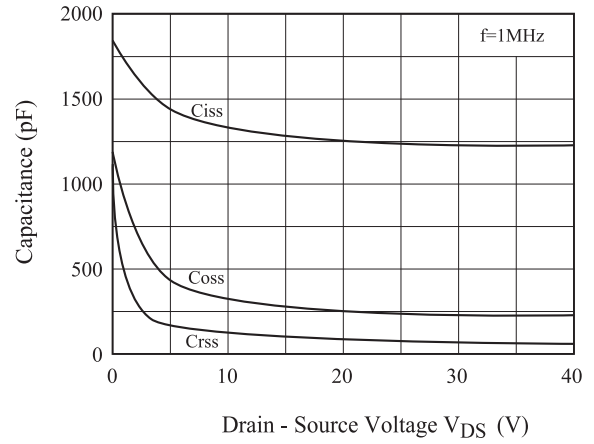


Fig9. Safe Operation Area

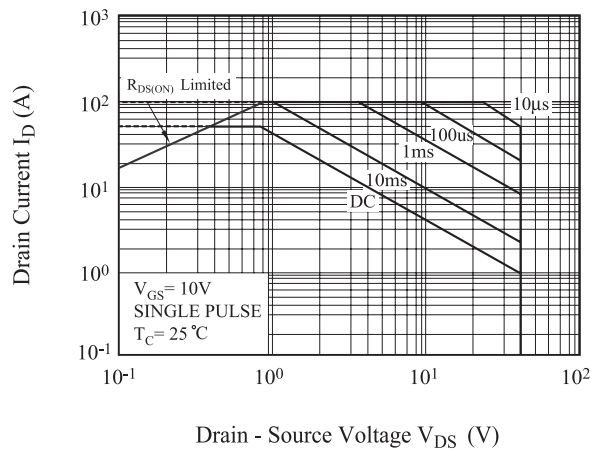


Fig10. Transient Thermal Response Curve

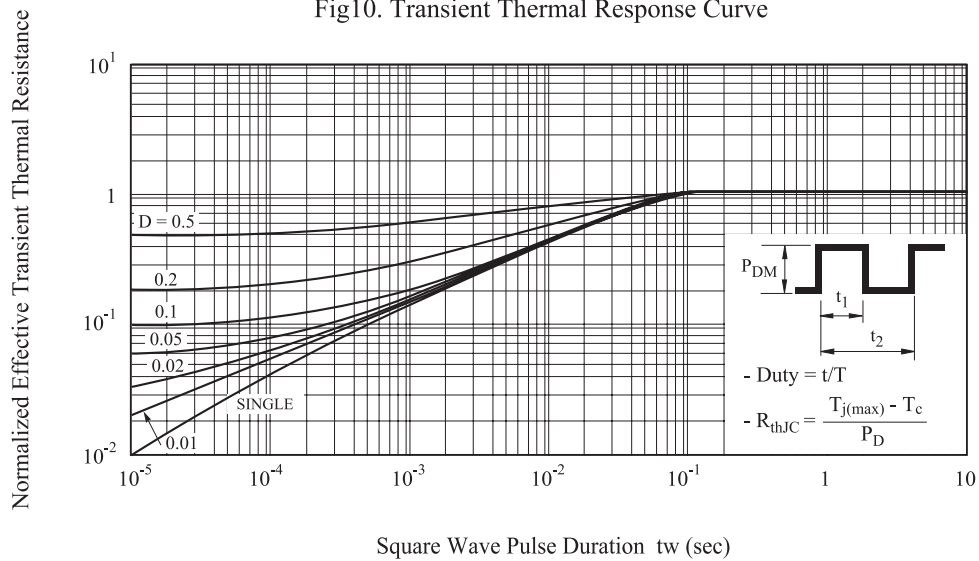


Fig11. Gate Charge Circuit and Wave Form

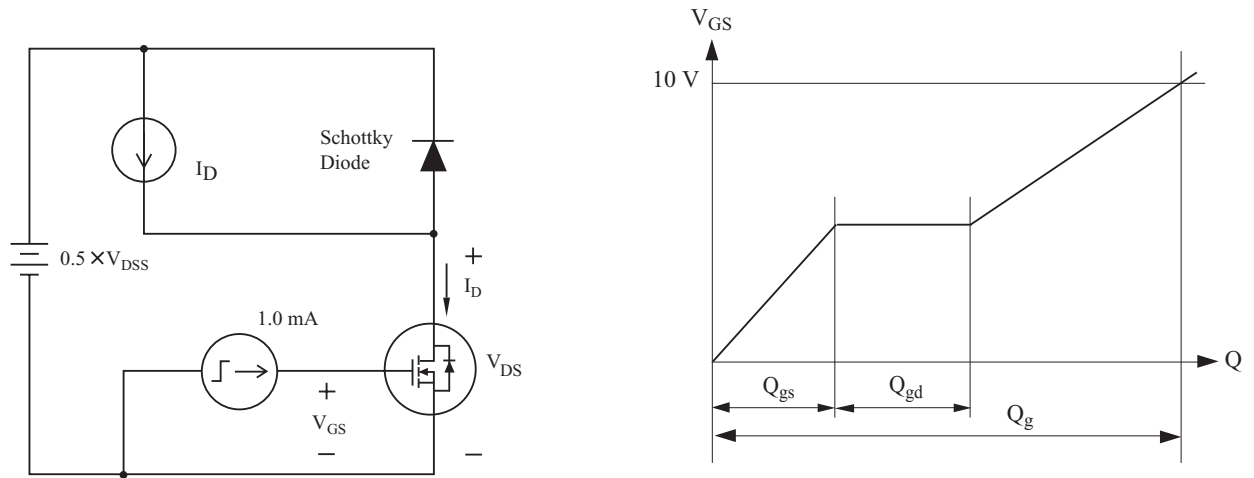


Fig12. Resistive Load Switching

