

General Description

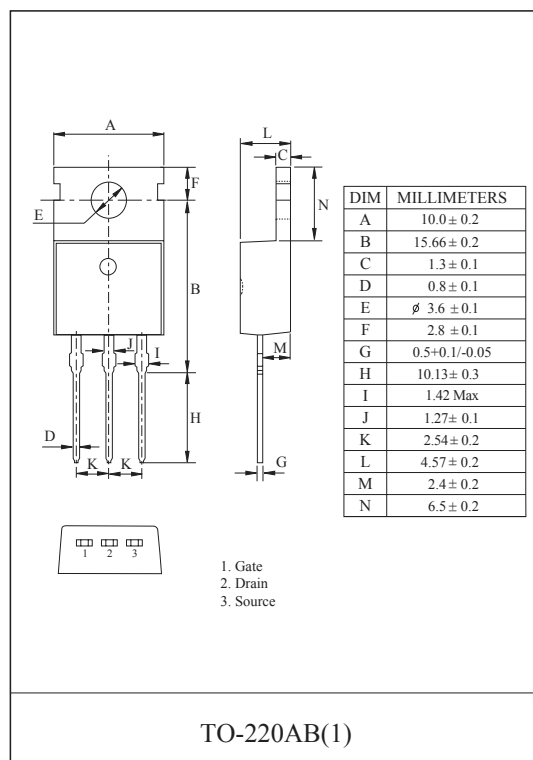
This Trench MOSFET has better characteristics, such as fast switching time, low on resistance, low gate charge and excellent avalanche characteristics. It is mainly suitable for DC/DC Converter, Synchronous Rectification and a load switch in battery powered applications

FEATURES

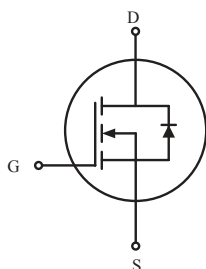
- $V_{DS} = 200V$, $I_D = 66A$
- Drain-Source ON Resistance :
 $R_{DS(ON)} = 21m\Omega$ (Max.) @ $V_{GS} = 10V$

MAXIMUM RATING (Tc=25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DS}	200	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current	@T _C =25°C	I_D	66	A
	@T _C =100°C		42	
	Pulsed (Note1)	I_{DP}	210	
Single Pulsed Avalanche Energy (Note 2)		E_{AS}	340	mJ
Repetitive Avalanche Energy (Note 1)		E_{AR}	6.1	mJ
Peak Diode Recovery dv/dt (Note 3)		dv/dt	4.5	V/ns
Drain Power Dissipation	Tc=25°C	P_D	223	W
	Derate above 25°C		1.8	W/°C
Maximum Junction Temperature		T_j	150	°C
Storage Temperature Range		T_{stg}	-55 ~ 150	°C
Thermal Characteristics				
Thermal Resistance, Junction-to-Case		R_{thJC}	0.56	°C/W
Thermal Resistance, Junction-to-Ambient		R_{thJA}	62.5	°C/W



PIN CONNECTION



KU210N20PS1

ELECTRICAL CHARACTERISTICS (T_j=25 °C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250 μA, V _{GS} =0V	200	-	-	V
Breakdown Voltage Temperature Coefficient	ΔBV _{DSS} /ΔT _j	I _D =5mA, Referenced to 25 °C	-	0.15	-	V/°C
Drain Cut-off Current	I _{DSS}	V _{DS} =200V, V _{GS} =0V	-	-	1	μA
Gate Threshold Voltage	V _{th}	V _{DS} =V _{GS} , I _D =250 μA	2.0	-	4.0	V
Gate Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
Drain-Source ON Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =20A	-	16	21	mΩ
Dynamic						
Total Gate Charge	Q _g	V _{DS} =100V, I _D =20A, V _{GS} =10V (Note4,5)	-	35	-	nC
Gate-Source Charge	Q _{gs}		-	12	-	
Gate-Drain Charge	Q _{gd}		-	4	-	
Turn-on Delay time	t _{d(on)}	V _{DD} =100V I _D =20A R _G =10 Ω V _{GS} =10V (Note4,5)	-	34	-	ns
Turn-on Rise time	t _r		-	19	-	
Turn-off Delay time	t _{d(off)}		-	63	-	
Turn-off Fall time	t _f		-	24	-	
Input Capacitance	C _{iss}	V _{DS} =100V, V _{GS} =0V, f=1.0MHz	-	2620	-	pF
Output Capacitance	C _{oss}		-	230	-	
Reverse Transfer Capacitance	C _{rss}		-	11	-	
Source-Drain Diode Ratings						
Diode Forward Voltage	V _{SD}	I _S =20A, V _{GS} =0V	-	0.9	1.2	V
Reverse Recovery Time	t _{rr}	I _S =20A, V _{GS} =0V, V _{DS} =100V	-	120	-	ns
Reverse Recovery Charge	Q _{rr}	dI _S /dt=100A/ μs	-	0.57	-	μC

Note 1) Repetivity rating : Pulse width limited by junction temperature.

Note 2) L=1.35mH, I_S=20A, V_{DD}=50V, R_G=25 Ω , Starting T_j=25 °C.

Note 3) I_S $\leq$ 20A, dI_S/dt=100A/ μ s, V_{DD} $\leq$ BV_{DSS}, Starting T_j=25 °C.

Note 4) Pulse Test : Pulse width $\leq$ 300 μ s, Duty Cycle $\leq$ 2%.

Note 5) Essentially independent of operating temperature.

Marking

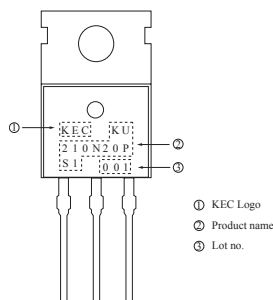


Fig 1. $I_D - V_{DS}$

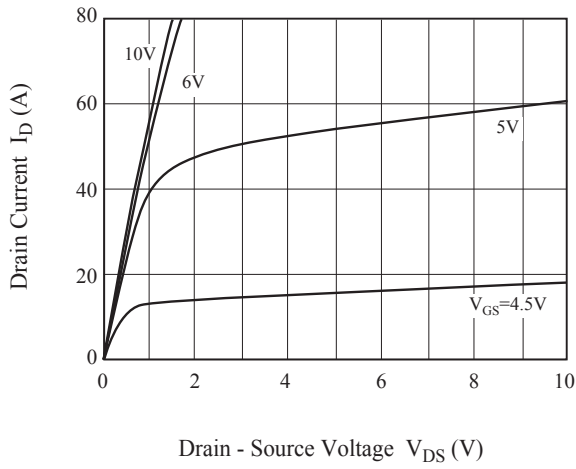


Fig 2. $R_{DS(on)} - I_D$

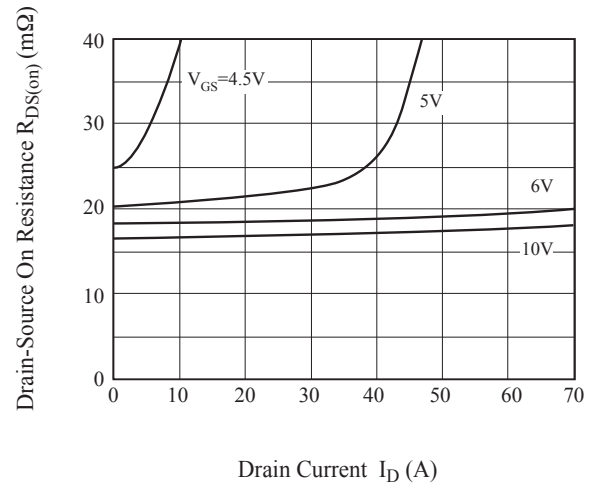


Fig 3. $I_D - V_{GS}$

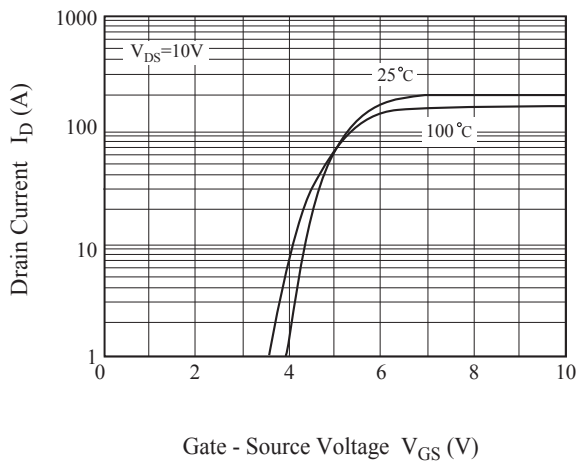


Fig 4. $R_{DS(ON)} - T_J$

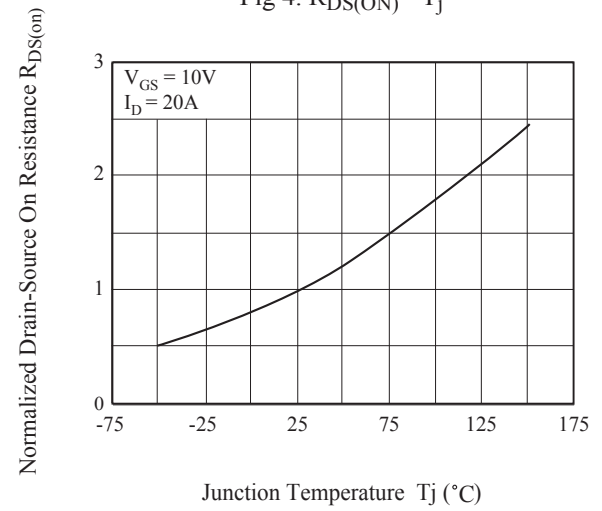


Fig 5. $V_{th} - T_J$

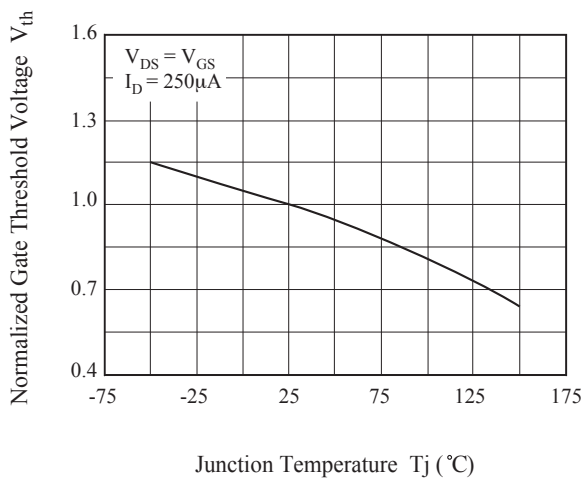
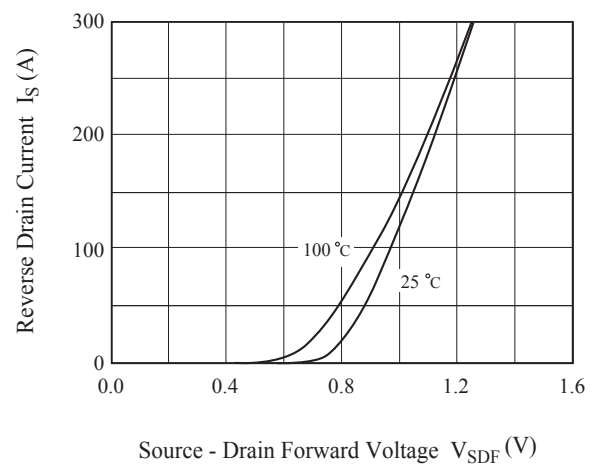


Fig 6. $I_S - V_{SDF}$



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Fig7. Q_g - V_{GS}

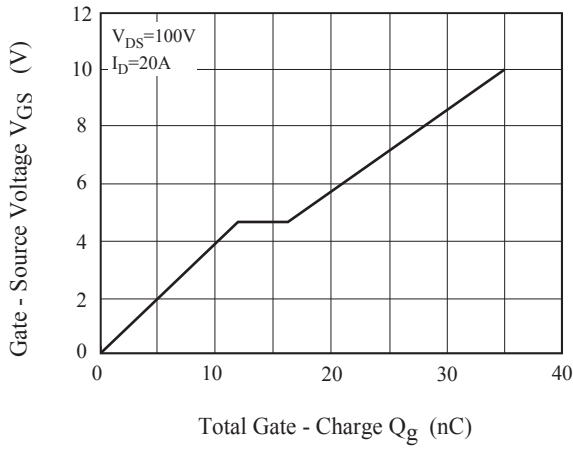


Fig 8. C - V_{DS}

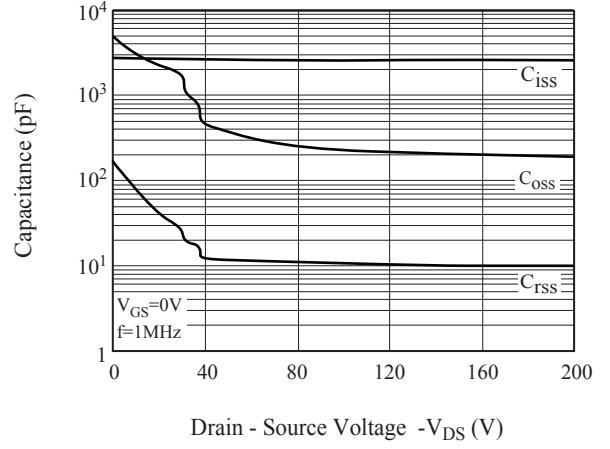


Fig 9. BV_{DSS} - T_j

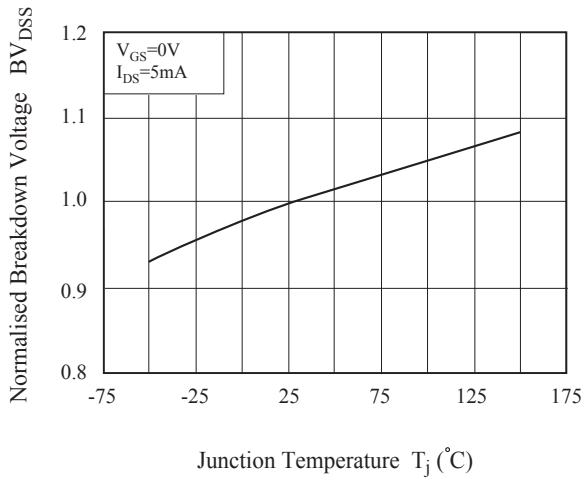


Fig10. Safe Operation Area

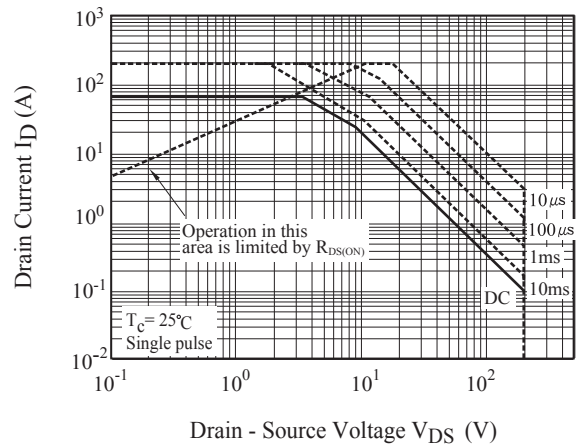


Fig11. Transient Thermal Response Curve

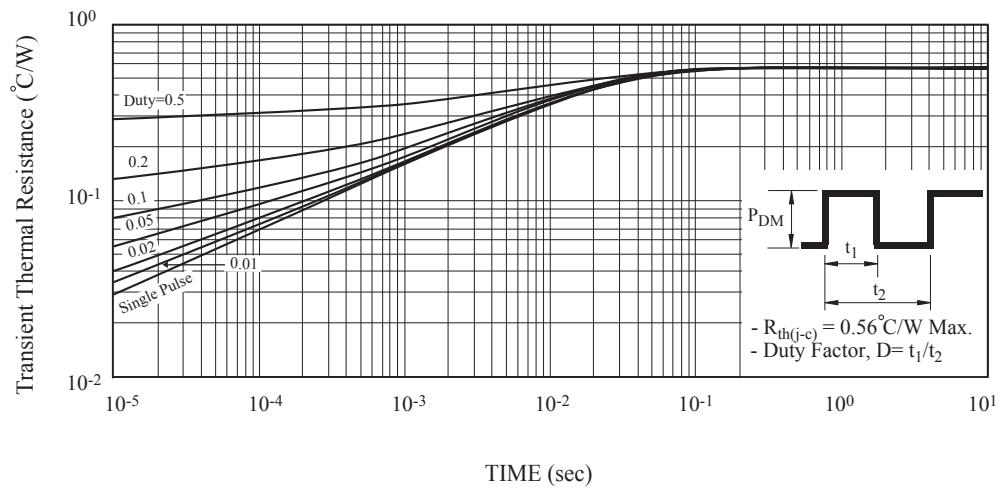


Fig12. Gate Charge

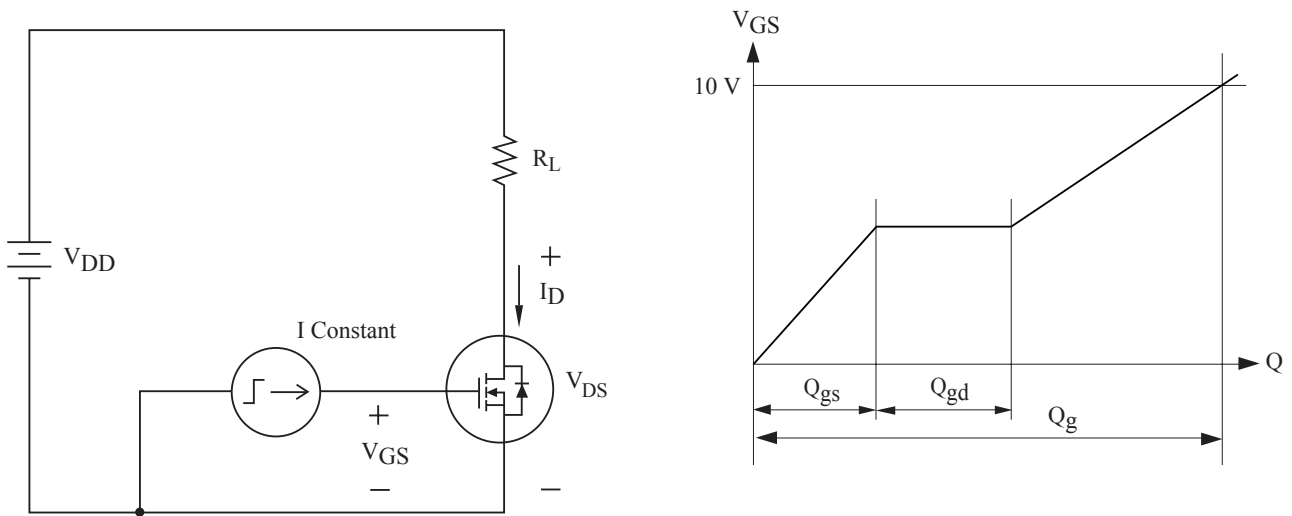


Fig13. Single Pulsed Avalanche Energy

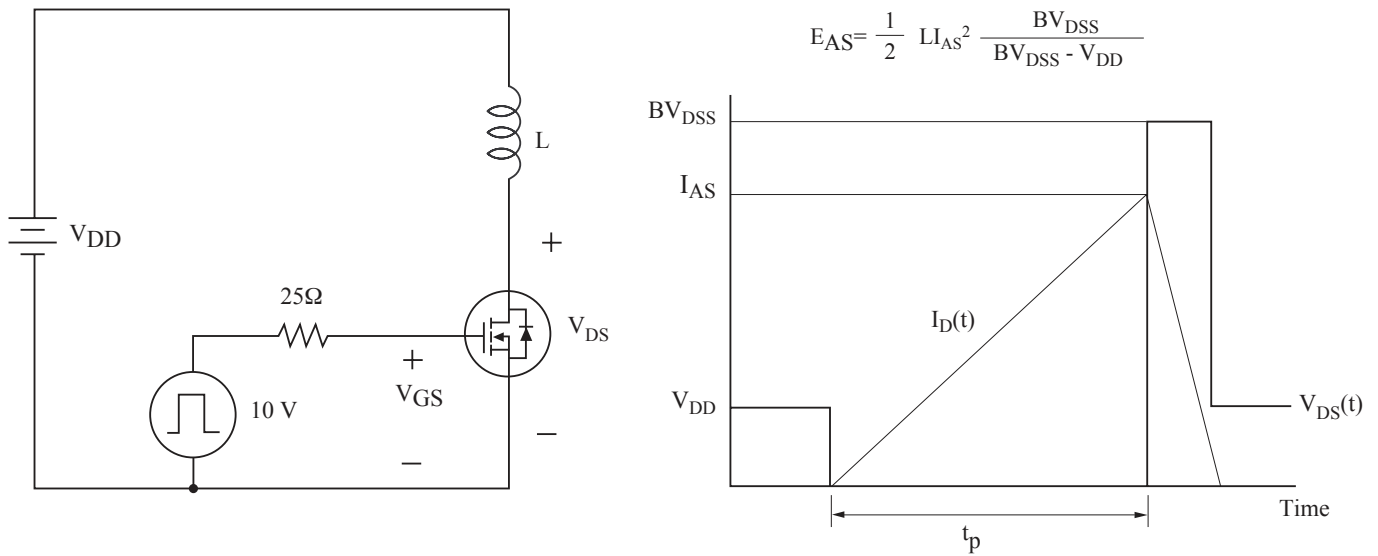


Fig14. Resistive Load Switching

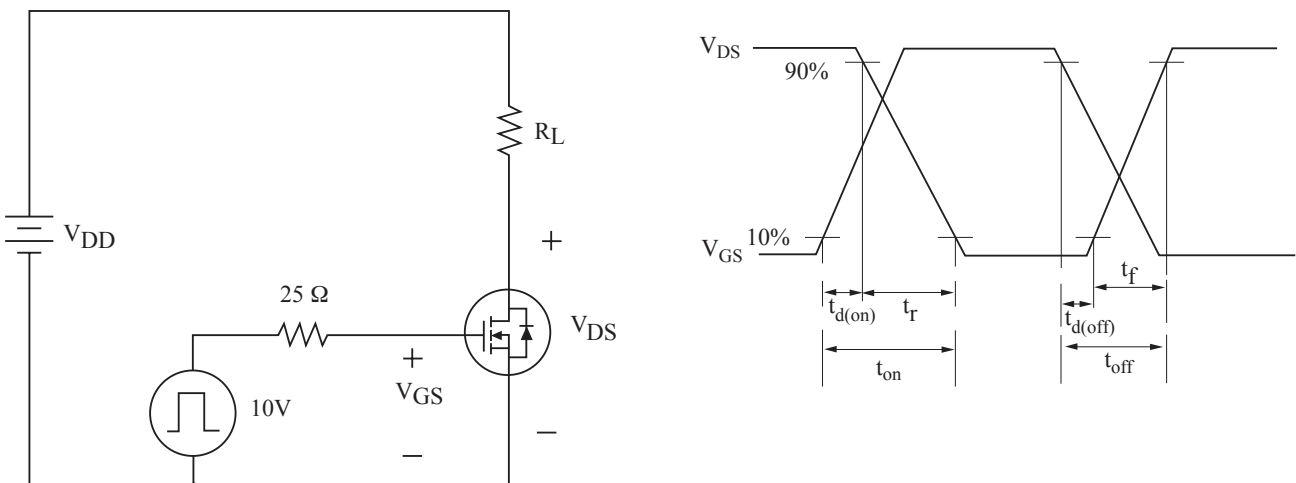


Fig15. Source - Drain Diode Reverse Recovery and dv/dt

