

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

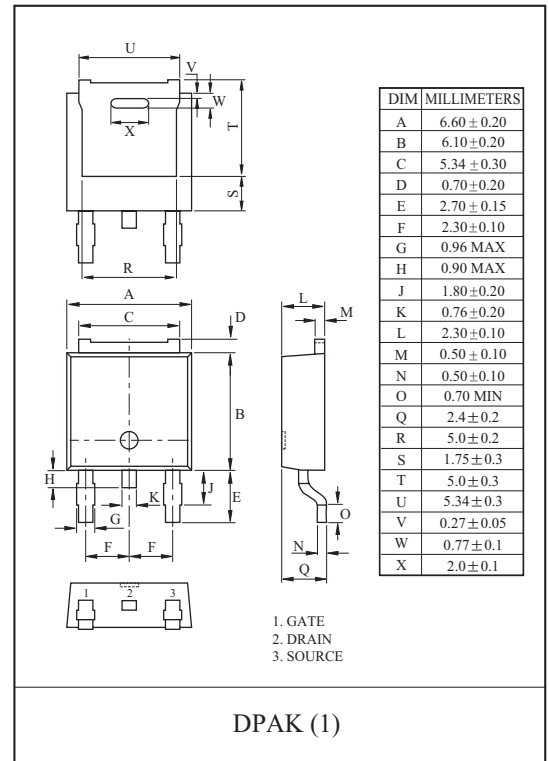
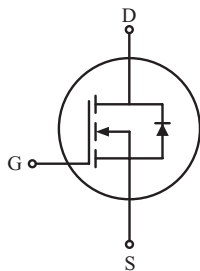
- $V_{DSS} = 100V$, $I_D = 27A$
- Drain-Source ON Resistance :
 $R_{DS(ON)} = 31m$ (Max.) @ $V_{GS} = 10V$

MAXIMUM RATING (Tc=25 °C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DSS}	100	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current	@Tc=25	27	A
	@Tc=100	17	
	Pulsed (Note1)	110*	
Single Pulsed Avalanche Energy (Note 2)	E_{AS}	60	mJ
Repetitive Avalanche Energy (Note 1)	E_{AR}	2.3	mJ
Peak Diode Recovery dv/dt (Note 3)	dv/dt	4.5	V/ns
Drain Power Dissipation	Tc=25	52	W
	Derate above 25	0.42	W/°C
Maximum Junction Temperature	T_j	150	
Storage Temperature Range	T_{stg}	-55 ~ 150	
Thermal Characteristics			
Thermal Resistance, Junction-to-Case	R_{thJC}	2.4	/W
Thermal Resistance, Junction-to-Ambient	R_{thJA}	110	/W

* : Drain current limited by maximum junction temperature.

PIN CONNECTION



KU310N10D

ELECTRICAL CHARACTERISTICS (Tc=25)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\ \mu A, V_{GS}=0V$	100	-	-	V
Breakdown Voltage Temperature Coefficient	BV_{DSS}/T_j	$I_D=5mA$, Referenced to 25	-	0.10	-	V/
Drain Cut-off Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$,	-	-	10	μA
Gate Threshold Voltage	V_{th}	$V_{DS}=V_{GS}, I_D=250\ \mu A$	2.0	-	4.0	V
Gate Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Drain-Source ON Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=13.5A$	-	25	31	m
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=80V, I_D=34A$ $V_{GS}=10V$ (Note4,5)	-	49	-	nC
Gate-Source Charge	Q_{gs}		-	10	-	
Gate-Drain Charge	Q_{gd}		-	14	-	
Turn-on Delay time	$t_{d(on)}$	$V_{DD}=50V$ $I_D=34A$ $R_G=25$ (Note4,5)	-	30	-	ns
Turn-on Rise time	t_r		-	32	-	
Turn-off Delay time	$t_{d(off)}$		-	115	-	
Turn-off Fall time	t_f		-	40	-	
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V, f=1.0MHz$	-	2230	-	pF
Output Capacitance	C_{oss}		-	170	-	
Reverse Transfer Capacitance	C_{rss}		-	85	-	
Source-Drain Diode Ratings						
Continuous Source Current	I_S	$V_{GS}<V_{th}$	-	-	34	A
Pulsed Source Current	I_{SP}		-	-	136	
Diode Forward Voltage	V_{SD}	$I_S=13.5A, V_{GS}=0V$	-	-	1.4	V
Reverse Recovery Time	t_{rr}	$I_S=34A, V_{GS}=0V$, $dI_S/dt=300A/\mu s$	-	53	-	ns
Reverse Recovery Charge	Q_{rr}		-	0.11	-	μC

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

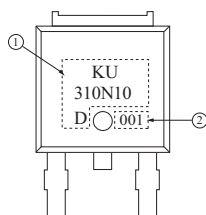
Note 2) $L=35\ \mu H, I_S=34A, V_{DD}=80V, R_G=25$, Starting $T_j=25$.

Note 3) $I_S=34A, dI/dt=200A/\mu s, V_{DD}=BV_{DSS}$, Starting $T_j=25$.

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

Note 5) Essentially independent of operating temperature.

Marking



① PRODUCT NAME

② LOT NO

Fig1. $I_D - V_{DS}$

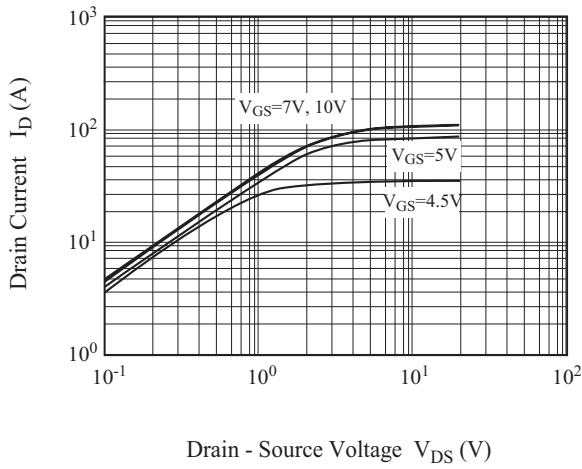


Fig2. $I_D - V_{GS}$

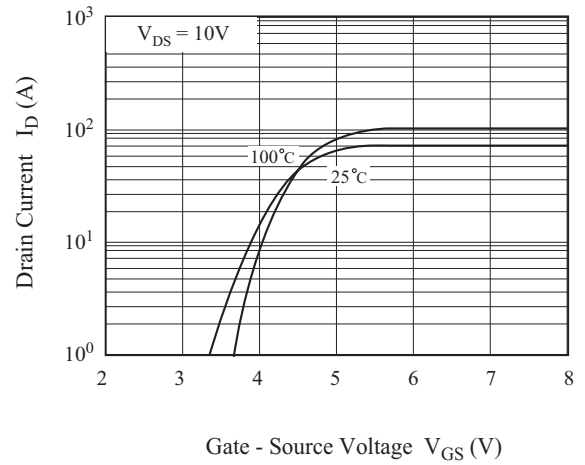


Fig3. $BV_{DSS} - T_j$

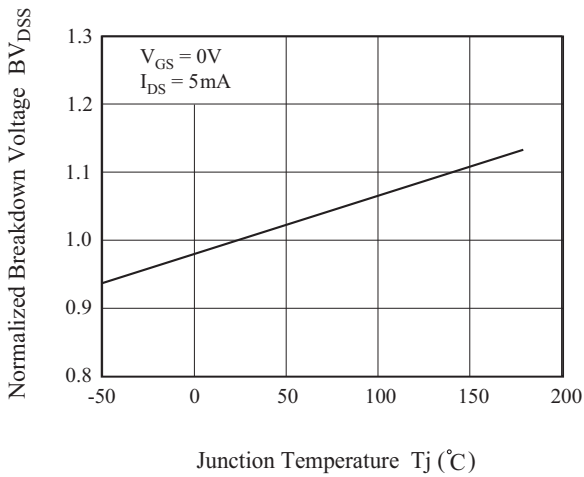


Fig4. $R_{DS(ON)} - T_j$

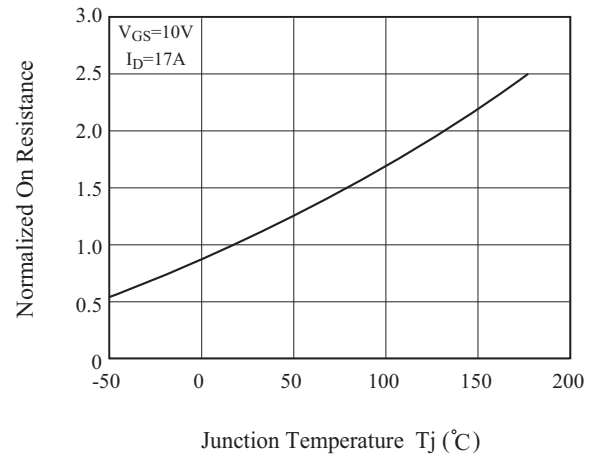


Fig5. $I_S - V_{SD} - I$

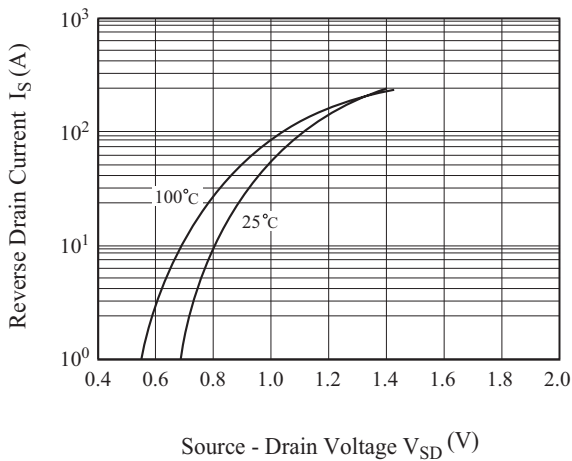


Fig6. $I_S - V_{SD} - II$

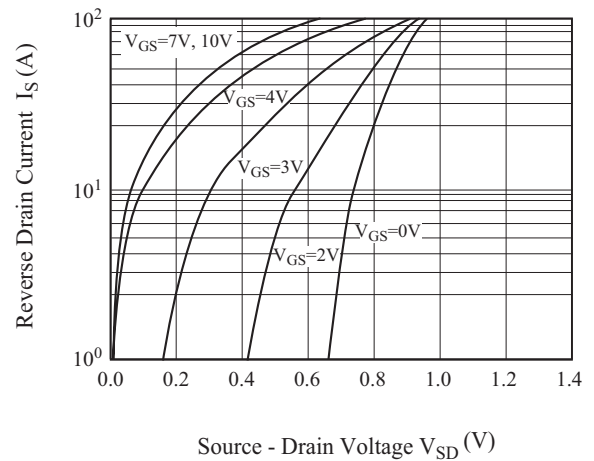


Fig7. $R_{DS(ON)} - I_D$

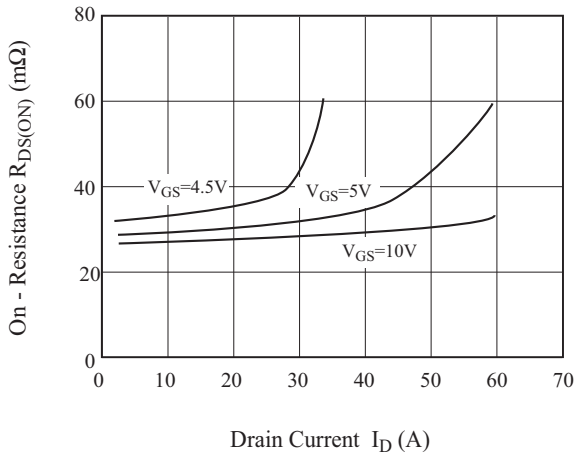


Fig8. $I_D - T_j$

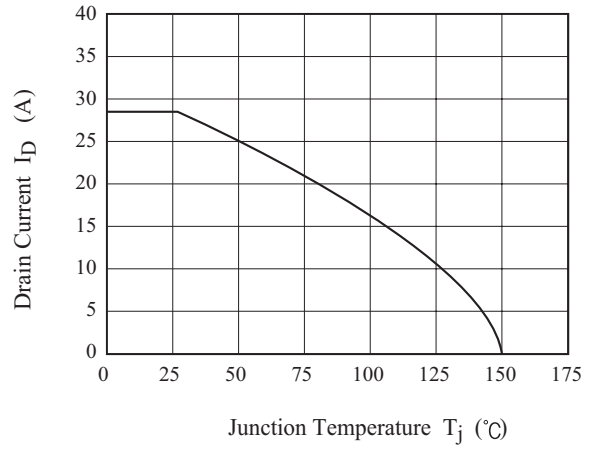


Fig 9. $C - V_{DS}$

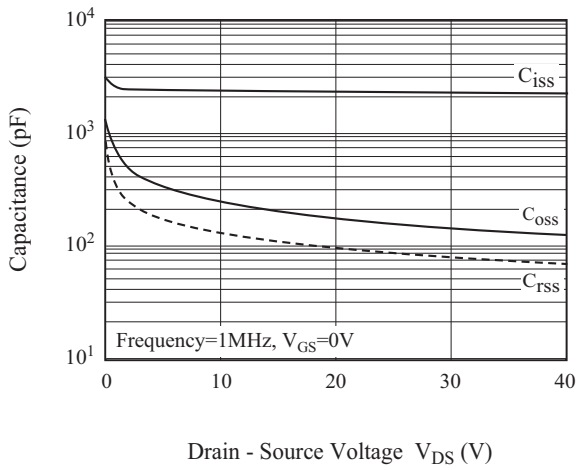


Fig10. $Q_g - V_{GS}$

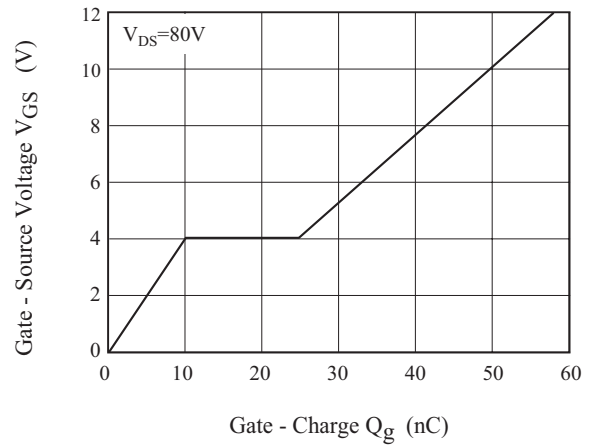


Fig11. Safe Operation Area

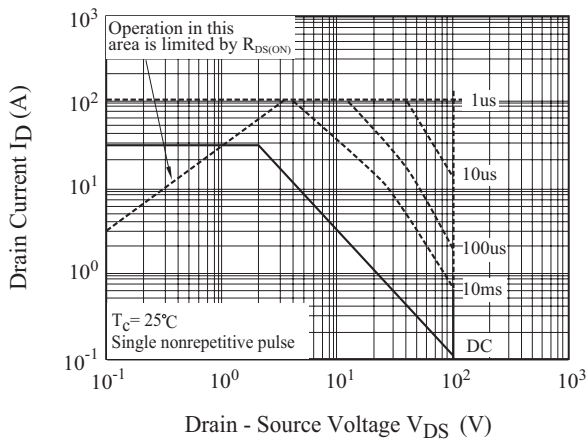


Fig12. Transient Thermal Response Curve

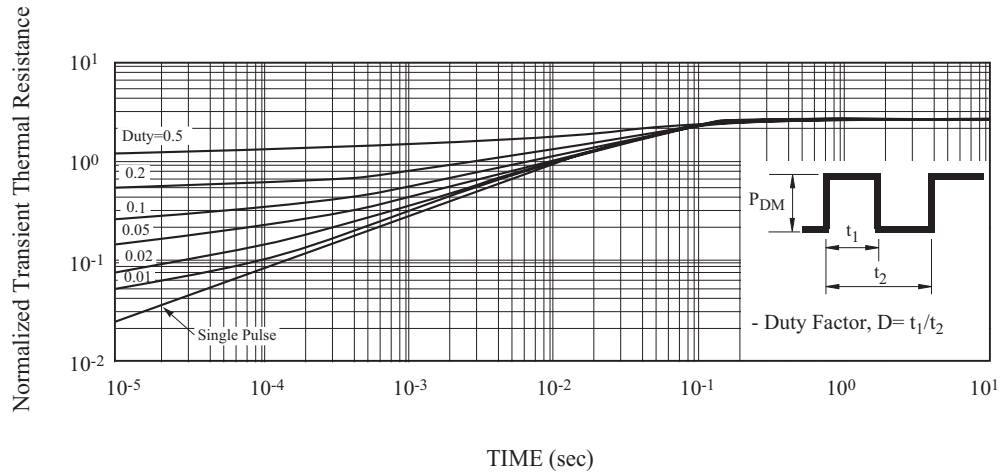


Fig13. Gate Charge

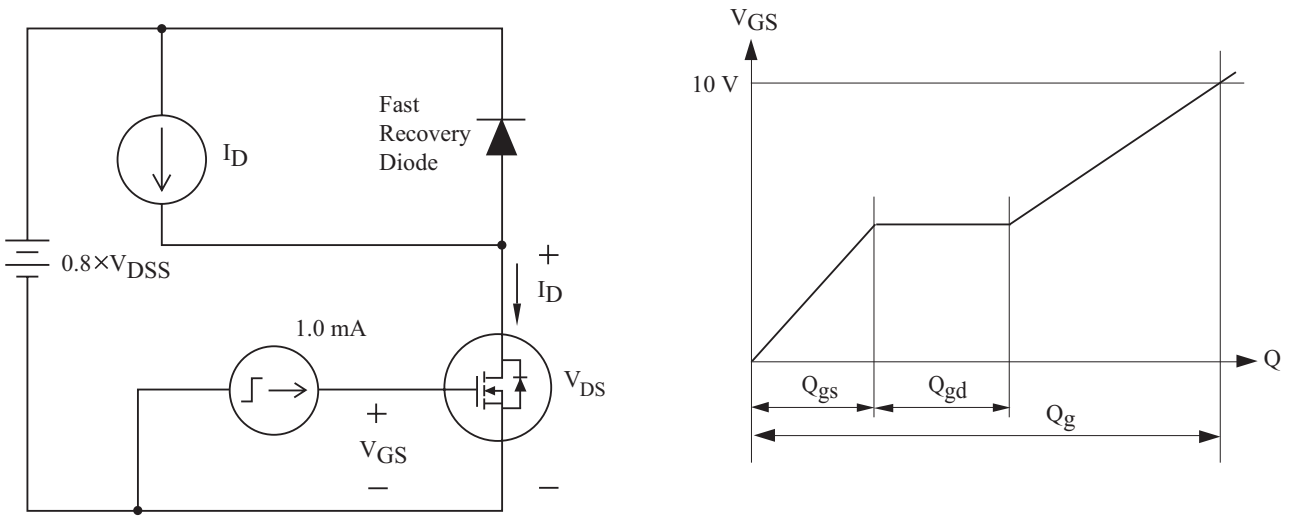


Fig14. Single Pulsed Avalanche Energy

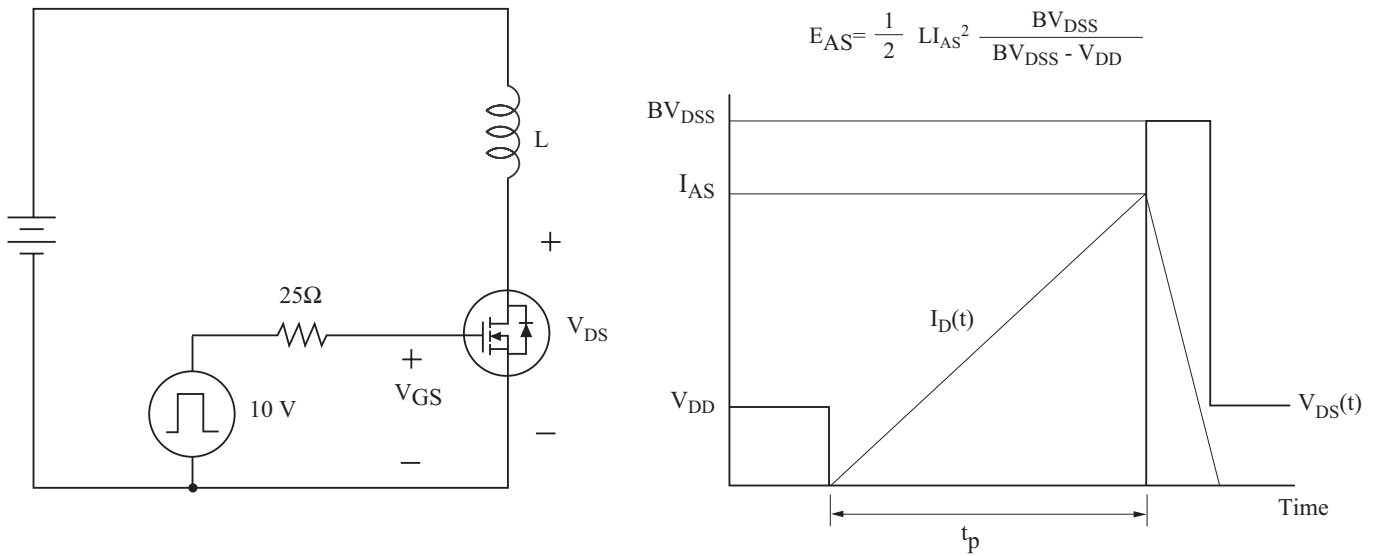


Fig15. Resistive Load Switching

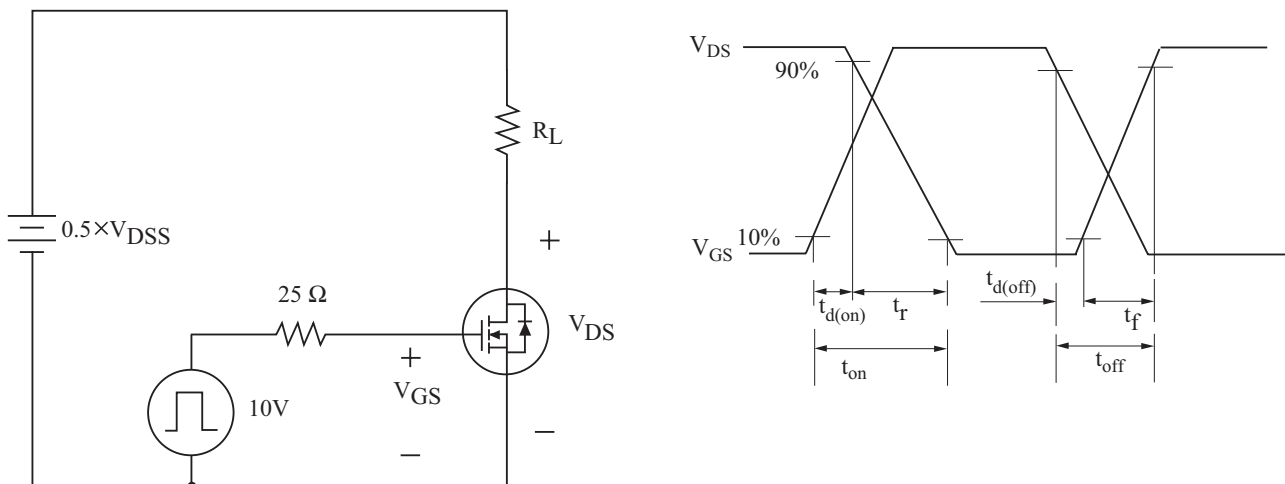


Fig16. Source - Drain Diode Reverse Recovery and dv/dt

