General Description

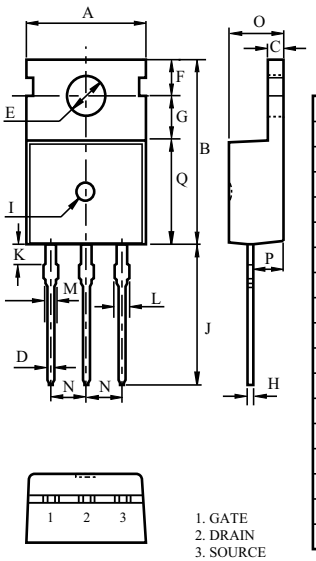
This Trench MOSFET has better characteristics, such as fast switching time, low on resistance, low gate charge and excellent avalanche characteristics. It is mainly suitable for DC/DC Converter, Synchronous Rectification and a load switch in battery powered applications

FEATURES

· V_{DSS}= 60V, I_D= 160A

· Drain-Source ON Resistance :

$R_{DS(ON)}$=3.5mΩ(Max.) @V_{GS} = 10V



DIM	MILLIMETERS
A	9.9 ± 0.2
B	15.95 MAX
C	1.3+0.1/-0.05
D	0.8 ± 0.1
E	ø3.6 ± 0.2
F	2.8 ± 0.1
G	3.7
H	0.5+0.1/-0.05
I	ø1.5
J	13.08 ± 0.3
K	1.46
L	1.4 ± 0.1
M	1.27 ± 0.1
N	2.54 ± 0.2
O	4.5 ± 0.2
P	2.4 ± 0.2
Q	9.2 ± 0.2

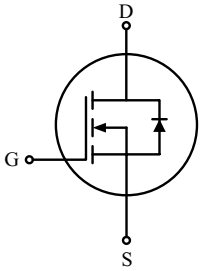
TO-220AB

MAXIMUM RATING (Tc=25℃)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	60	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current	@T_C=25℃	I_D	160*	A
	@T_C=100℃		101	
	Pulsed (Note1)	I_{DP}	480*	
Single Pulsed Avalanche Energy (Note 2)		E_{AS}	960	mJ
Repetitive Avalanche Energy (Note 1)		E_{AR}	12	mJ
Peak Diode Recovery dv/dt (Note 3)		dv/dt	4.5	V/ns
Drain Power Dissipation	Tc=25℃	P_D	167	W
	Derate above 25℃		1.33	W/℃
Maximum Junction Temperature		T_j	150	℃
Storage Temperature Range		T_{stg}	-55 ~ 150	℃
Thermal Characteristics				
Thermal Resistance, Junction-to-Case		R_{thJC}	0.75	℃/W
Thermal Resistance, Junction-to-Ambient		R_{thJA}	62.5	℃/W

* : Drain current limited by maximum junction temperature.
Calculated continuous Current based on maximum allowable junction temperature

PIN CONNECTION



ELECTRICAL CHARACTERISTICS (Tc=25℃)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=250 μA, V_{GS}=0V	60	-	-	V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_j$	I_D=5mA, Referenced to 25℃	-	0.06	-	V/℃
Drain Cut-off Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V,	-	-	10	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=80A	-	2.9	3.5	mΩ
Dynamic						
Total Gate Charge	Q_g	V_{DS}=48V, I_D=80A V_{GS}=10V (Note4,5)	-	200	-	nC
Gate-Source Charge	Q_{gs}		-	35	-	
Gate-Drain Charge	Q_{gd}		-	70	-	
Turn-on Delay time	$t_{d(on)}$	V_{DD}=30V I_D=80A R_G=25Ω (Note4,5)	-	110	-	ns
Turn-on Rise time	t_r		-	150	-	
Turn-off Delay time	$t_{d(off)}$		-	460	-	
Turn-off Fall time	t_f		-	280	-	
Input Capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, f=1.0MHz	-	8400	-	pF
Output Capacitance	C_{oss}		-	960	-	
Reverse Transfer Capacitance	C_{rss}		-	520	-	
Source-Drain Diode Ratings						
Continuous Source Current	I_S	V_{GS}<V_{th}	-	-	150	A
Pulsed Source Current	I_{SP}		-	-	600	
Diode Forward Voltage	V_{SD}	I_S=150A, V_{GS}=0V	-	-	1.4	V
Reverse Recovery Time	t_{rr}	I_S=80A, V_{GS}=0V, dIs/dt=300A/μs	-	65	-	ns
Reverse Recovery Charge	Q_{rr}		-	0.18	-	μC

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

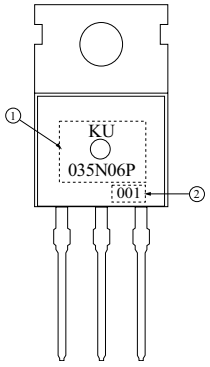
Note 2) L =100 μH, I_S=80A, V_{DD}=48V, R_G=25Ω, Starting T_j=25℃.

Note 3) I_S≤80A, dI/dt≤200A/μs, V_{DD}≤BV_{DSS}, Starting T_j=25℃.

Note 4) Pulse Test : Pulse width ≤ 300μs, Duty Cycle ≤ 2%.

Note 5) Essentially independent of operating temperature.

Marking



① PRODUCT NAME

② LOT NO

Fig1. I_D - V_{DS}

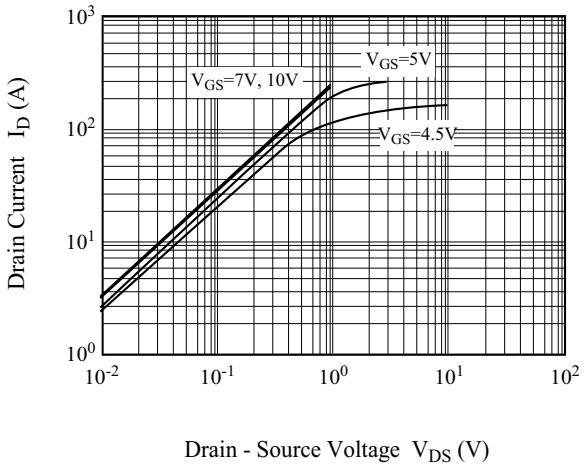


Fig2. I_D - V_{GS}

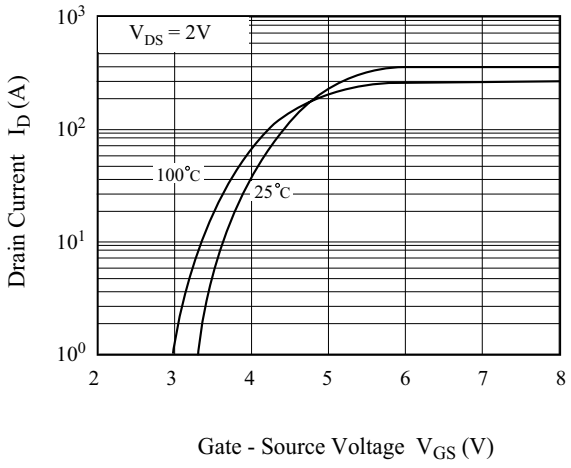


Fig3. BV_{DSS} - T_j

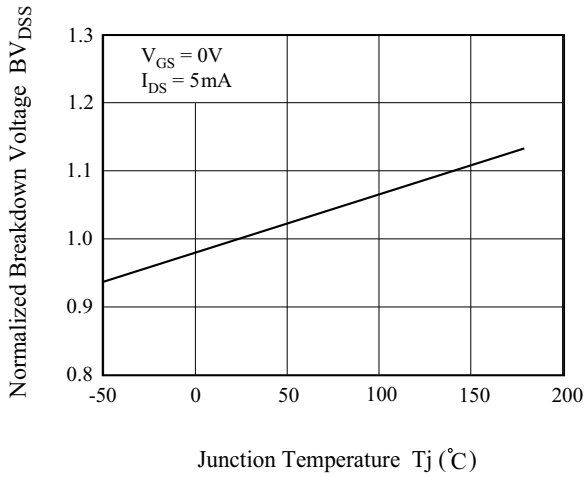


Fig4. $R_{DS(ON)}$ - I_D

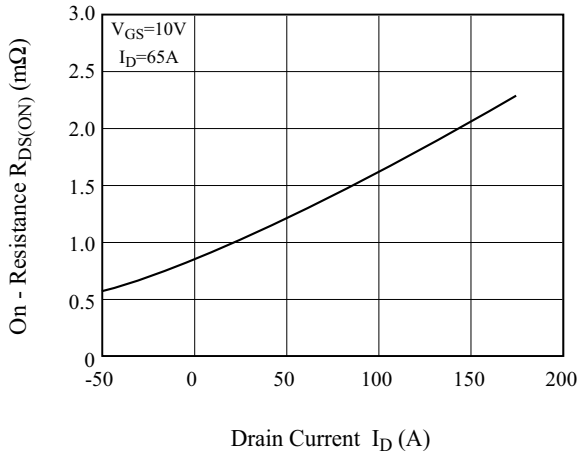


Fig5. I_S - V_{SD} - Ⅰ

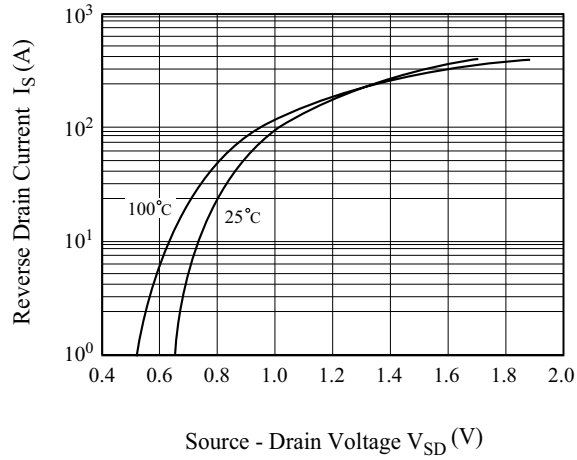


Fig6. I_S - V_{SD} - Ⅱ

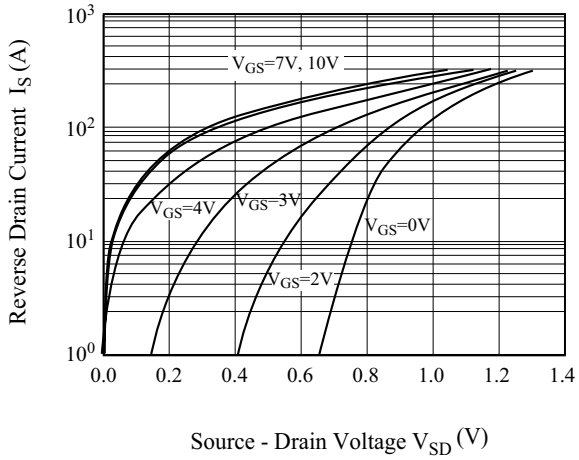


Fig7. $R_{DS(ON)}$ - I_D

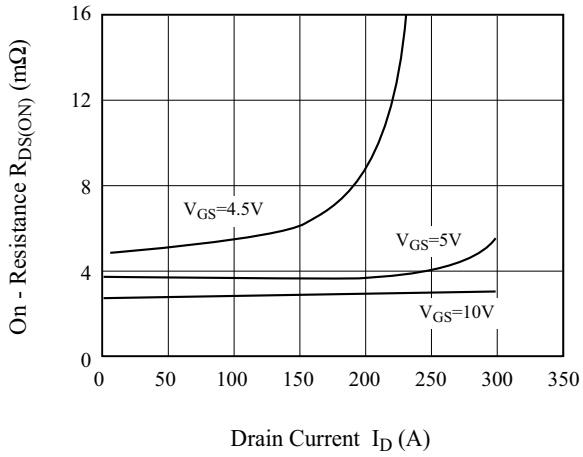


Fig8. I_D- T_j

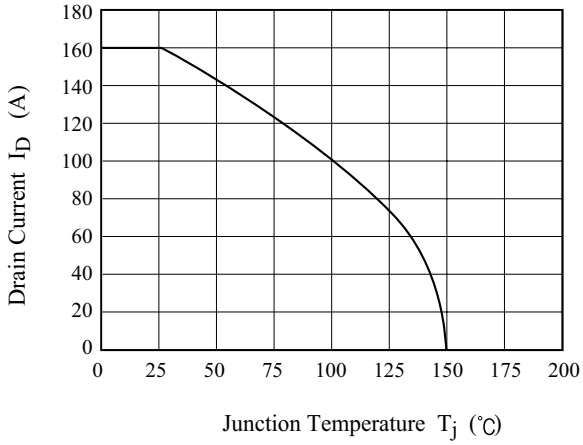


Fig 9. C - V_{DS}

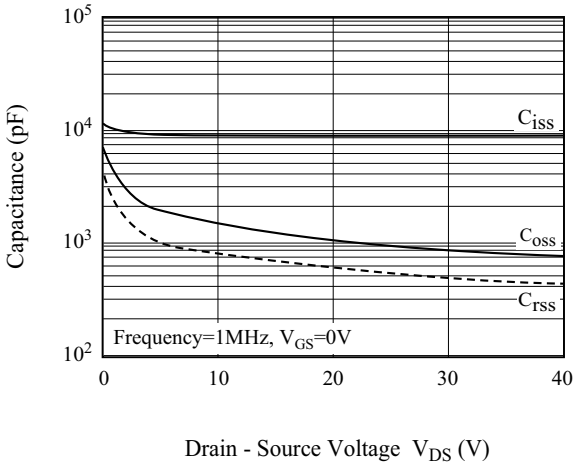


Fig10. Q_g- V_{GS}

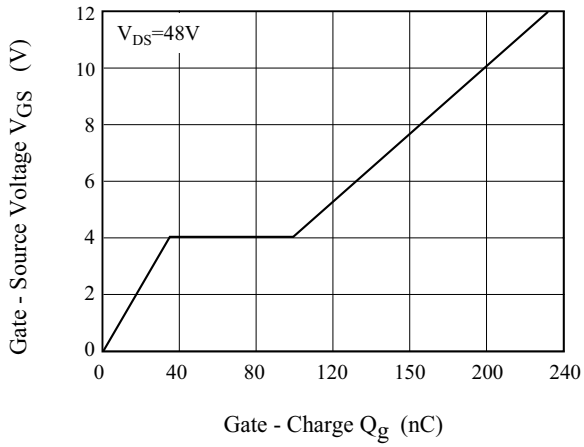


Fig11. Safe Operation Area

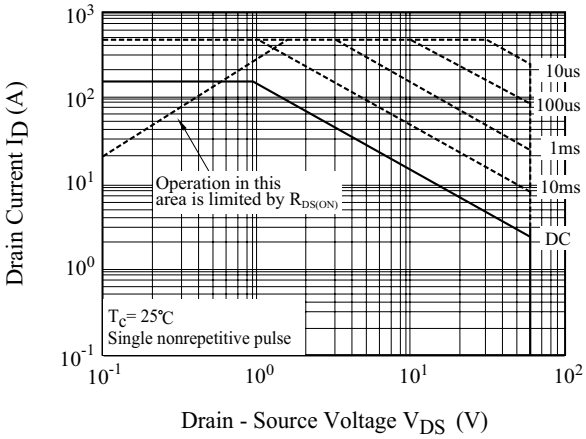


Fig12. Transient Thermal Response Curve

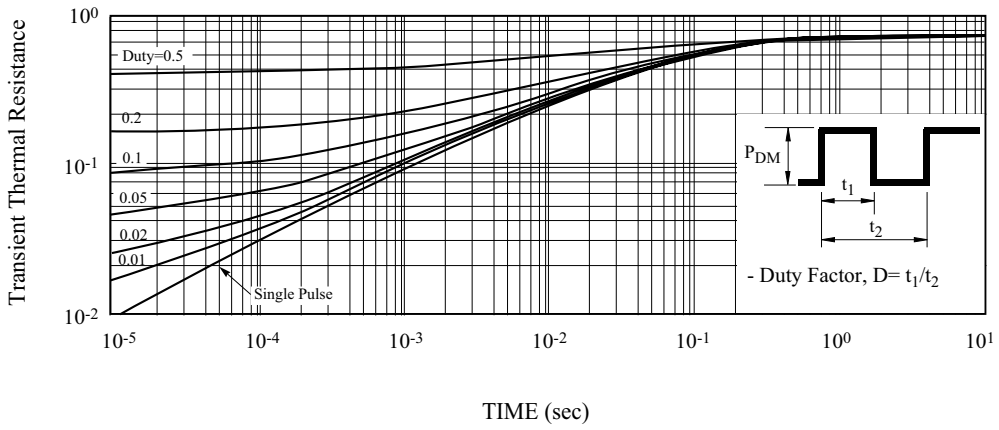


Fig13. Gate Charge

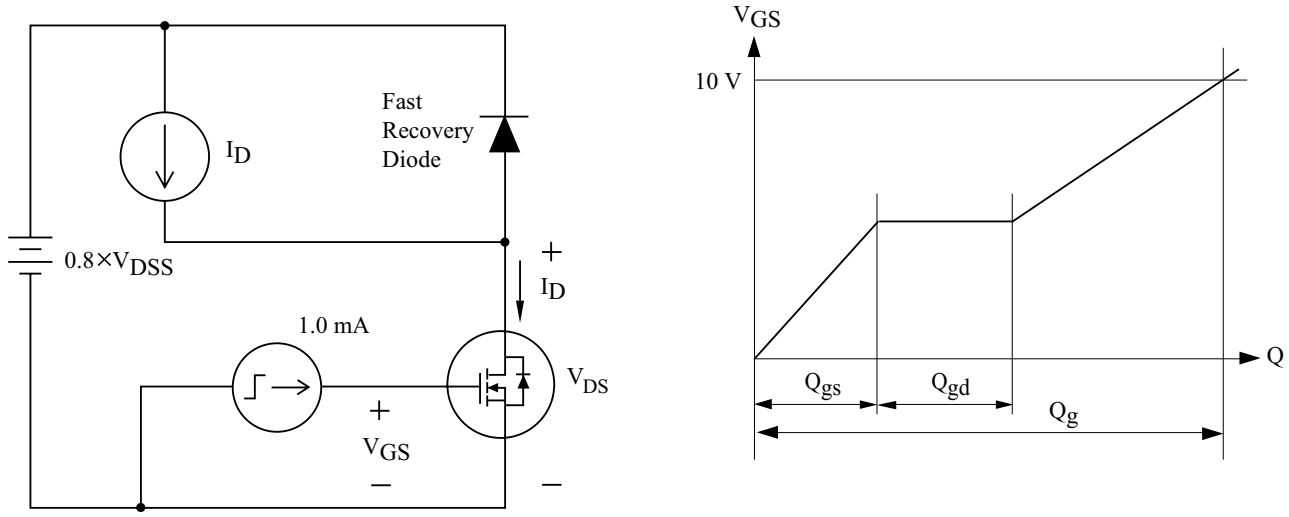


Fig14. Single Pulsed Avalanche Energy

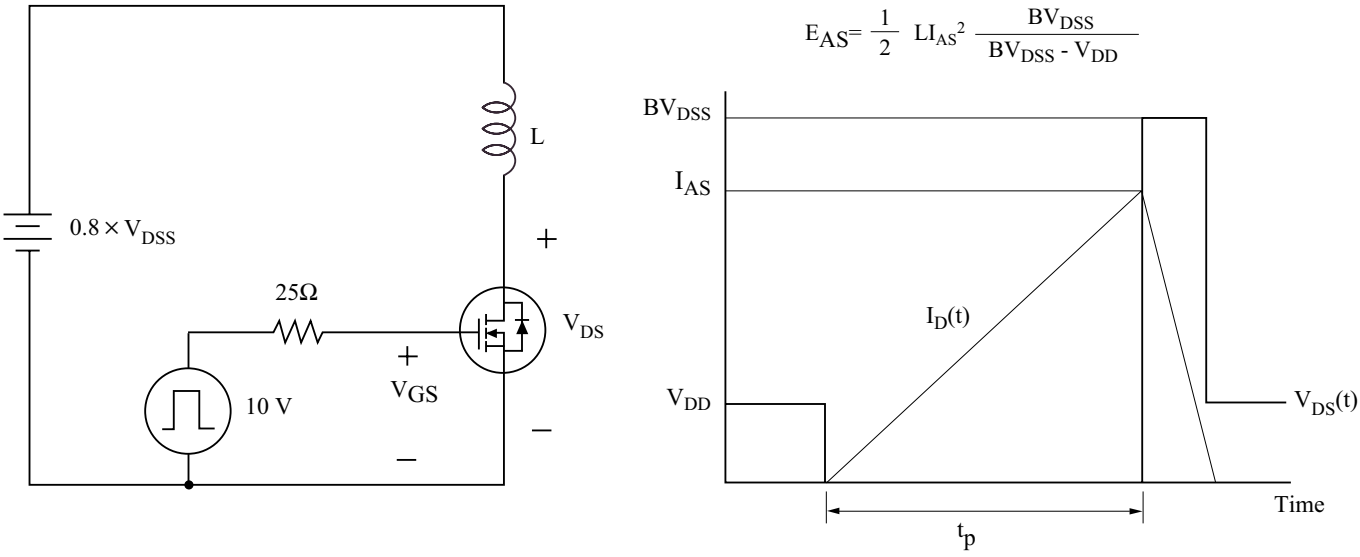


Fig15. Resistive Load Switching

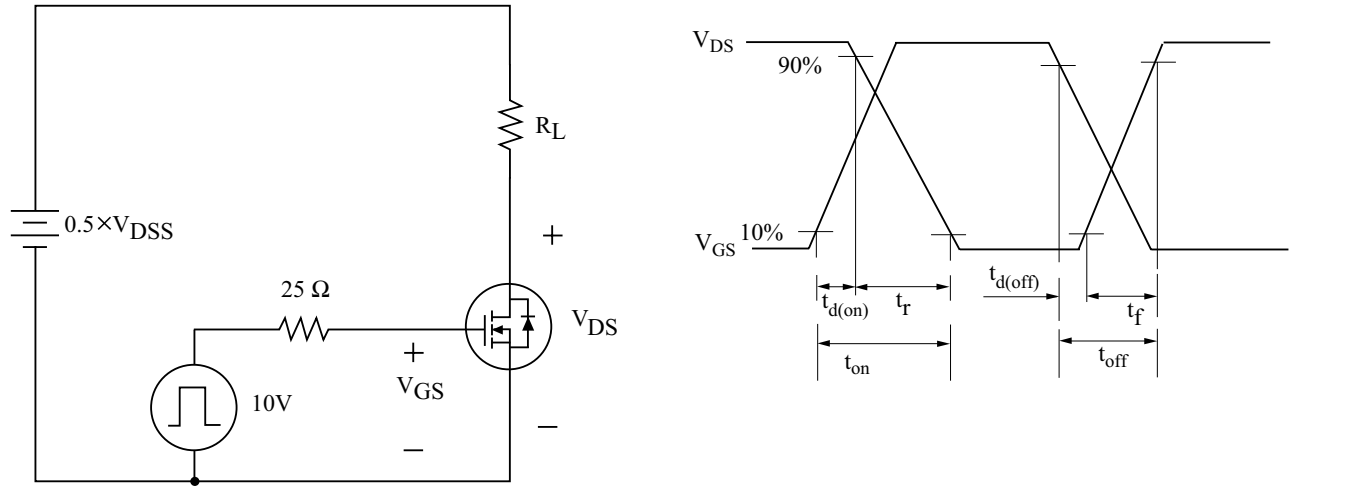


Fig16. Source - Drain Diode Reverse Recovery and dv /dt