

P-Ch Trench MOSFET

KU170P04FT2

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 inverters, a load switch and general purpose applications.

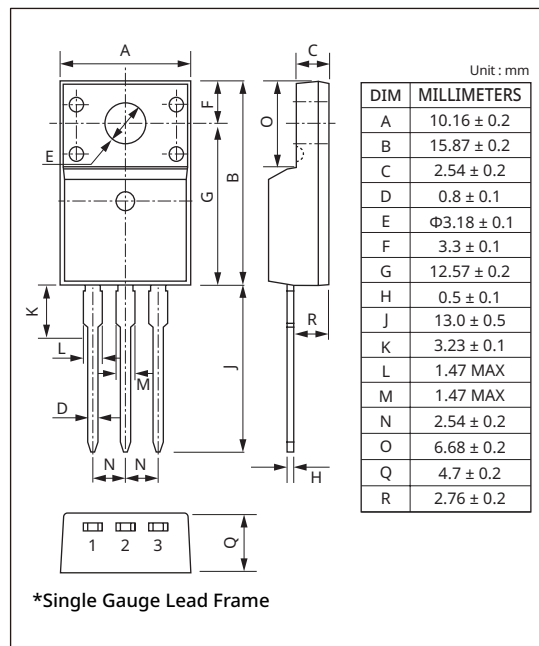
FEATURES

- $V_{DS} = -40V$, $I_D = -39.5A$
- Drain-Source ON Resistance :
 $R_{DS(ON)}(Max) = 17m\Omega @ V_{GS} = -10V$
 $R_{DS(ON)}(Max) = 25m\Omega @ V_{GS} = -4.5V$
- $Q_g(typ.) = 51nC$

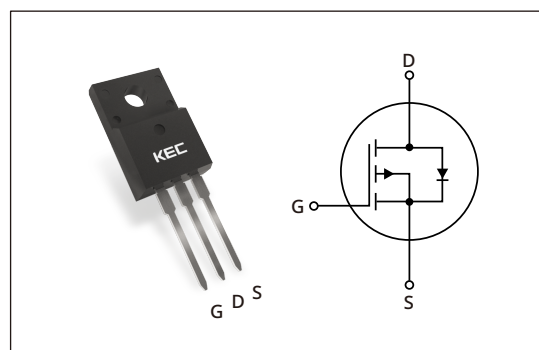
APPLICATION

- Inverters
- Load Switch
- General purpose applications

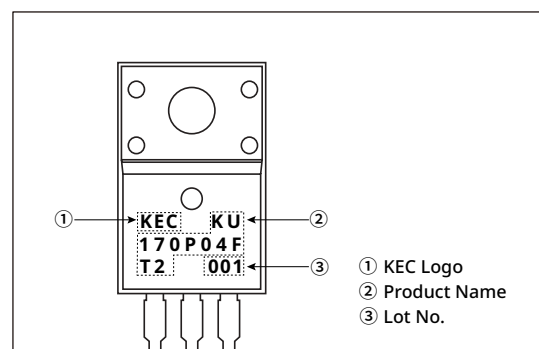
PACKAGE DIMENSION(TO-220IS(1))



PIN CONFIGURATION



MARKING CODE



PRODUCT DATASHEET

P-Ch Trench MOSFET - KU170P04FT2

MAXIMUM RATING (T_J=25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V _{DSS}	-40	V
Gate-Source Voltage		V _{GSS}	±20	V
Drain Current	T _C = 25°C	I _D	-39.5*	A
	T _C = 100°C		-25*	
	Pulsed (Note 1)	I _{DP}	-158*	
Single Pulsed Avalanche Energy (Note 2)		E _{AS}	159	mJ
Repetitive Avalanche Energy (Note 1)		E _{AR}	4.2	mJ
Peak Diode Recovery dv/dt (Note 3)		dv/dt	4.5	V/ns
Drain Power Dissipation	T _C = 25°C	P _D	44.6	W
	T _A = 25°C		2	W
Maximum Junction Temperature		T _J	150	°C
Storage Temperature Range		T _{stg}	-55 ~ 150	°C
Thermal Characteristics				
Thermal Resistance, Junction-to-Case	T _C = 25°C	R _{thJC}	2.8	°C/W
Thermal Resistance, Junction-to-Ambient	T _A = 25°C	R _{thJA}	62.5	°C/W

* : Drain current limited by maximum junction temperature.

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ELECTRICAL CHARACTERISTICS(T_J= 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D = -250μA, V _{GS} =0V	-40	-	-	V
Breakdown Voltage Temperature Coefficient	ΔBV _{DSS} /ΔT _J	I _D =-1 mA, Referenced to 25°C	-	-37	-	mV/°C
Drain Cut-off Current	I _{DSS}	V _{DS} =-40V, V _{GS} =0V	-	-	-1	μA
Gate Threshold Voltage	V _{th}	V _{DS} =V _{GS} , I _D =-250μA	-1.0	-2.0	-3.0	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	-	12	17	mΩ
		V _{GS} =-4.5V, I _D =-10A	-	17	25	
Dynamic						
Total Gate Charge	Q _g	V _{DD} =-20V, I _D =-20A V _{GS} =-10V (Note 4)	-	51	-	nC
Gate-Source Charge	Q _{gs}		-	8	-	
Gate-Drain Charge	Q _{gd}		-	11	-	
Turn-on Delay time	t _{d(on)}	V _{DD} =-20V, I _D =-20A V _{GS} =-10V, R _G =10Ω (Note 3, 4)	-	11	-	ns
Turn-on Rise time	t _r		-	3.3	-	
Turn-off Delay time	t _{d(off)}		-	102	-	
Turn-off Fall time	t _f		-	46	-	
Input Capacitance	C _{iss}	V _{DS} =-20V, V _{GS} =0V, f=1.0MHz	-	2600	-	pF
Output Capacitance	C _{oss}		-	440	-	
Reverse Transfer Capacitance	C _{rss}		-	240	-	
Source-Drain Diode Ratings						
Continuous Source Current	I _s	V _{GS} < V _{th}	-	-	-37	A
Diode Forward Voltage	V _{SD}	I _S =-20A, V _{GS} =0V	-	-	-1.2	V
Reverse Recovery Time	t _{rr}	I _S =-20A, V _{GS} =0V, V _{DD} =-20V dI _S /dt=-100A/μs	-	48	-	ns
Reverse Recovery Charge	Q _{rr}		-	75	-	nC

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

Note 2) L=130μH, I_D=-39.5A, V_{DD}=-20V, R_G=25Ω, Starting T_J=25°C.

Note 3) Pulse Test: Pulse width≤10μs, Duty Cycle≤2%.

Note 4) Essentially independent of operating temperature.

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Fig1. $I_D - V_{DS}$

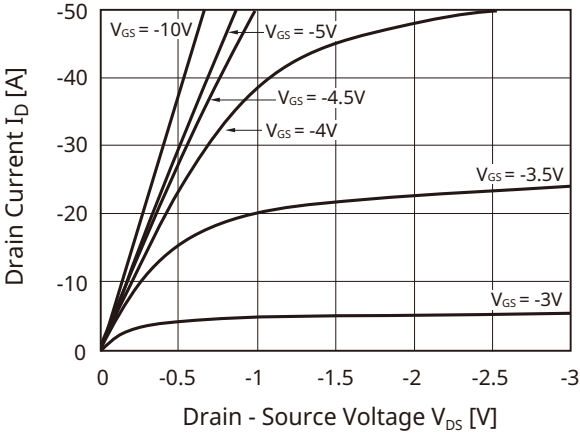


Fig2. $I_D - V_{DS}$

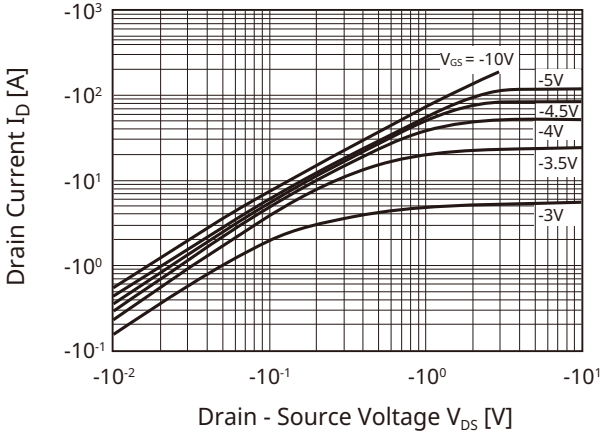


Fig3. $I_D - V_{GS}$

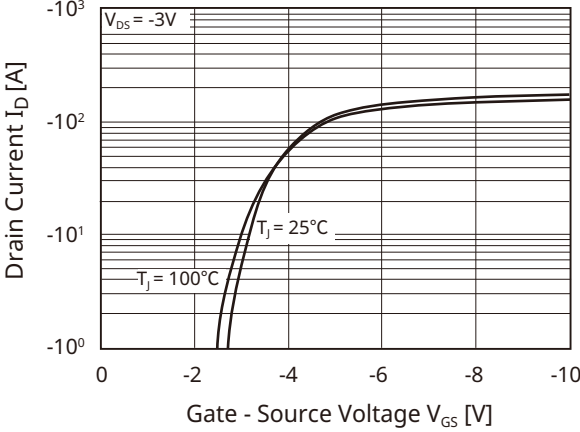


Fig4. $R_{DS(ON)} - I_D$

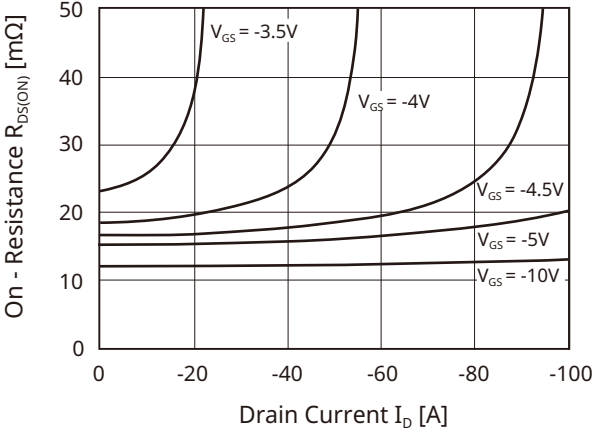


Fig5. $R_{DS(ON)} - V_{GS}$

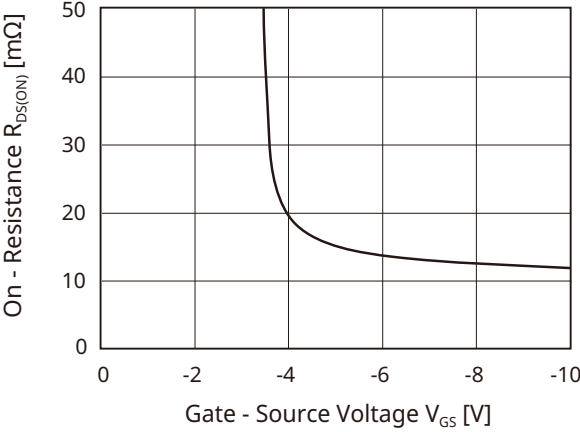
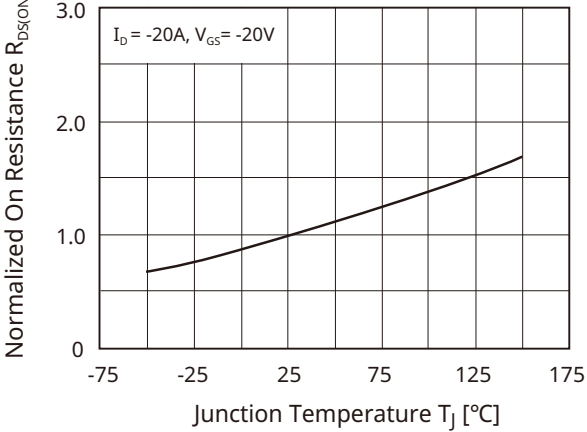
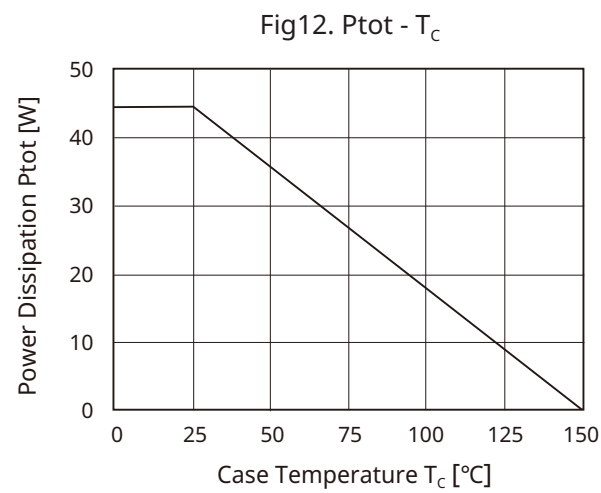
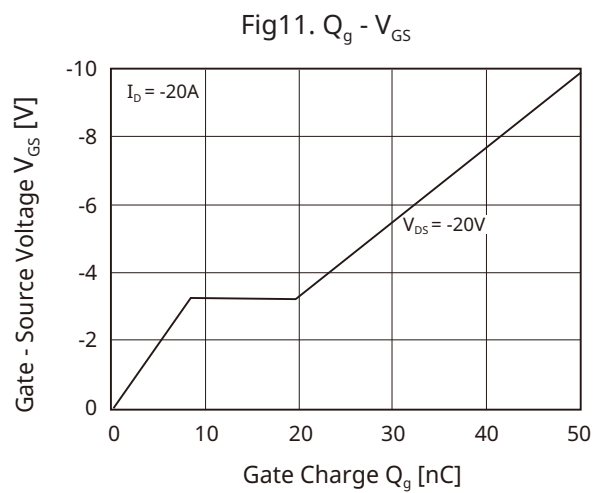
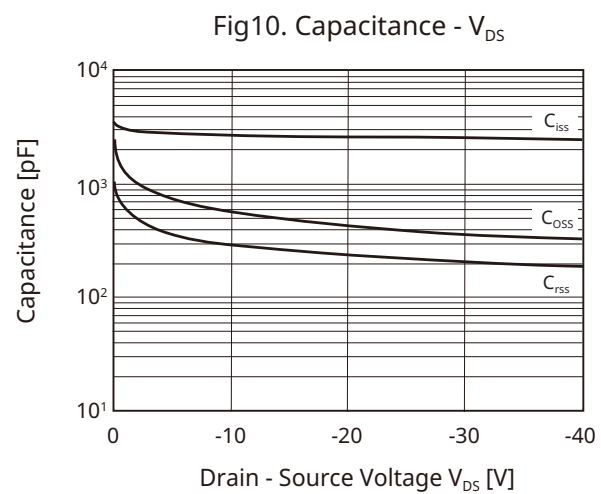
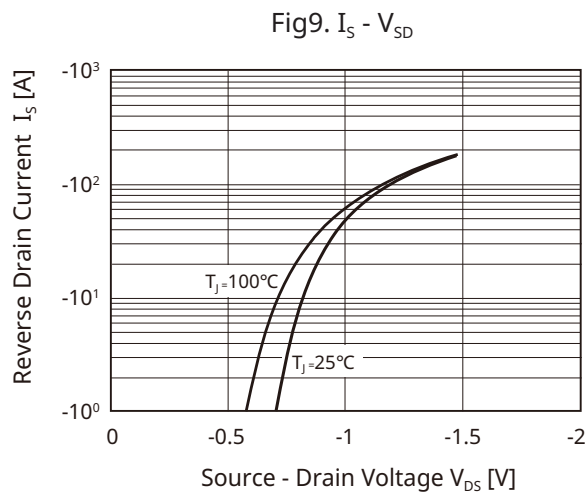
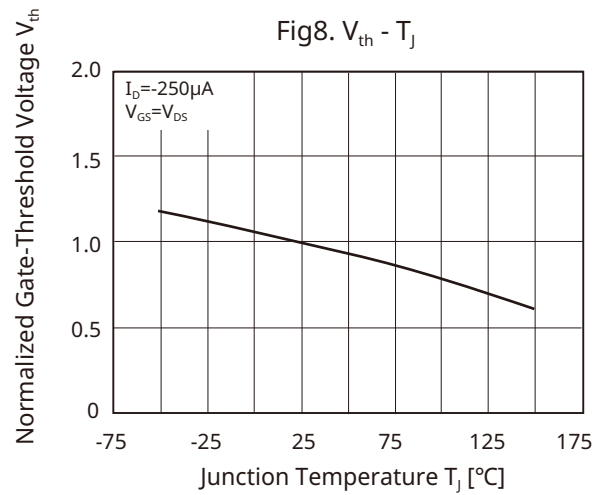
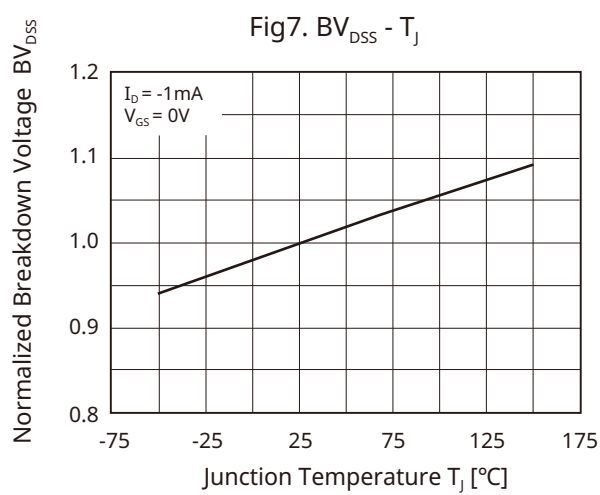


Fig6. $R_{DS(ON)} - T_J$



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Fig13. $I_D - T_J$

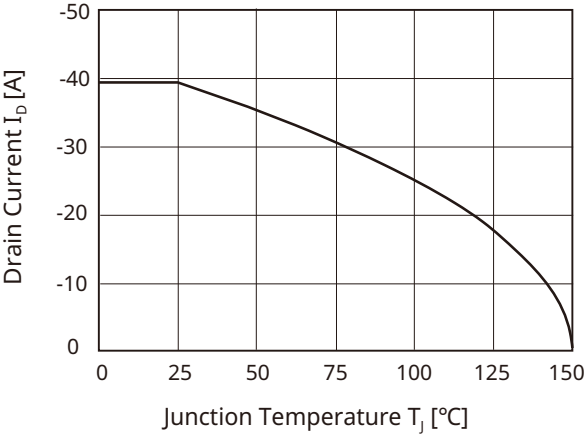


Fig14. Safe Operation Area

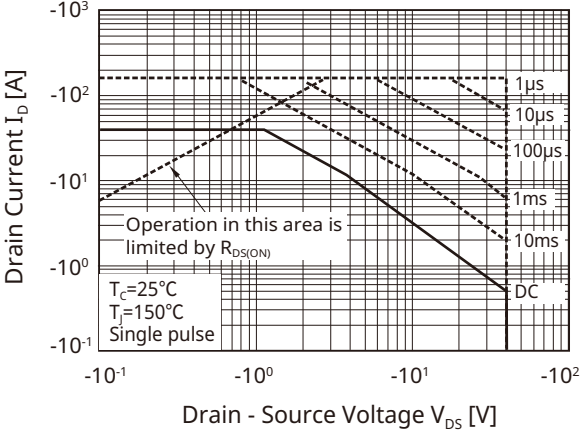


Fig15. Transient Thermal Response Curve (J-C)

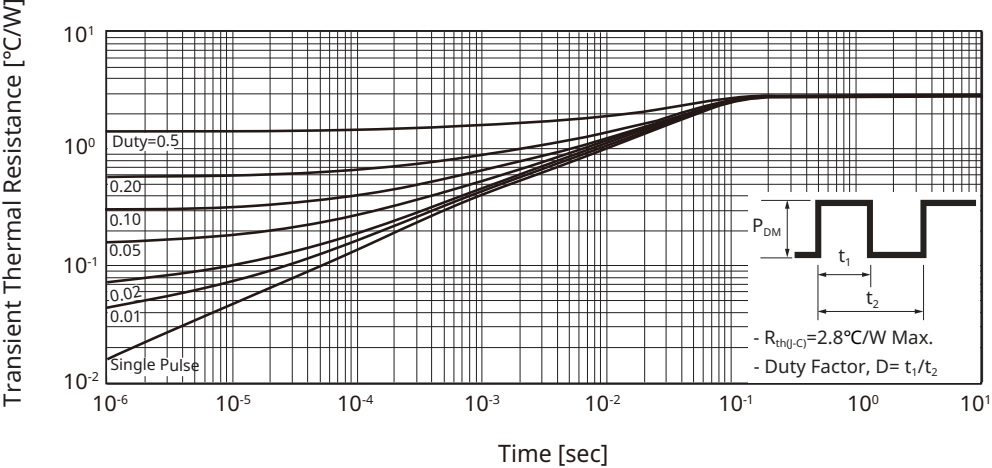


Fig16. Gate Charge

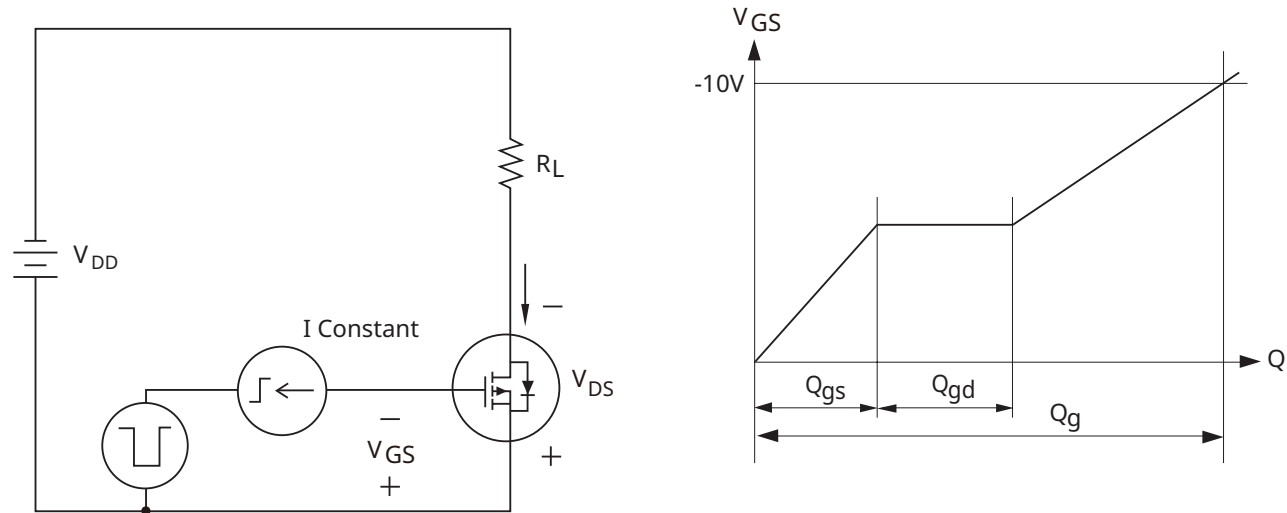


Fig17. Single Pulsed Avalanche Energy

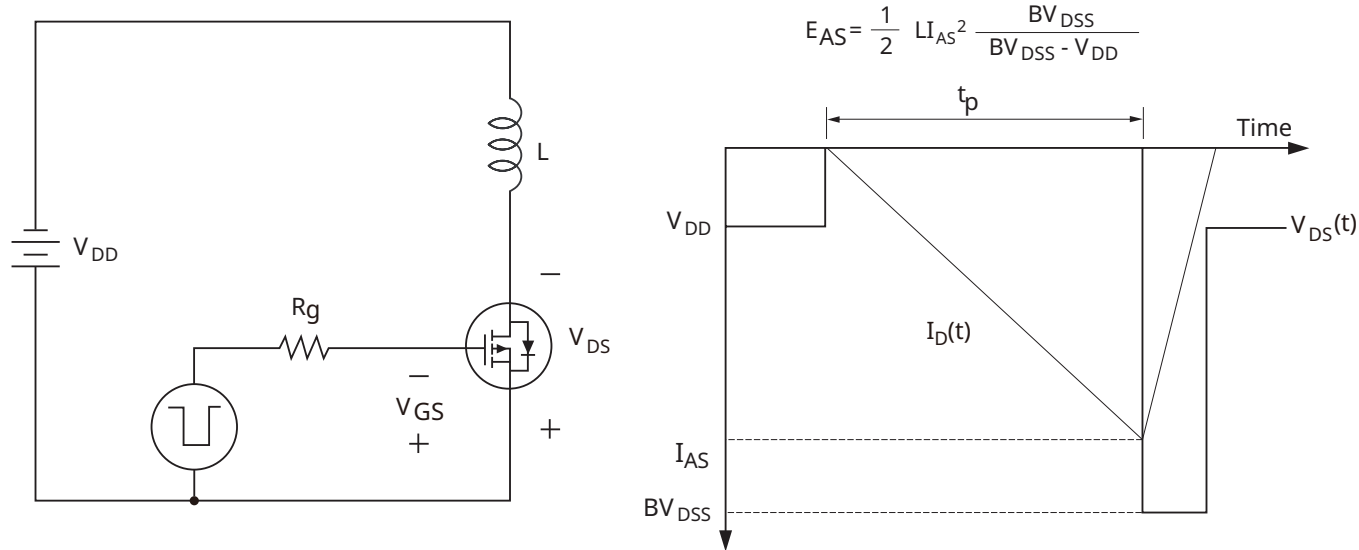


Fig18. Resistive Load Switching

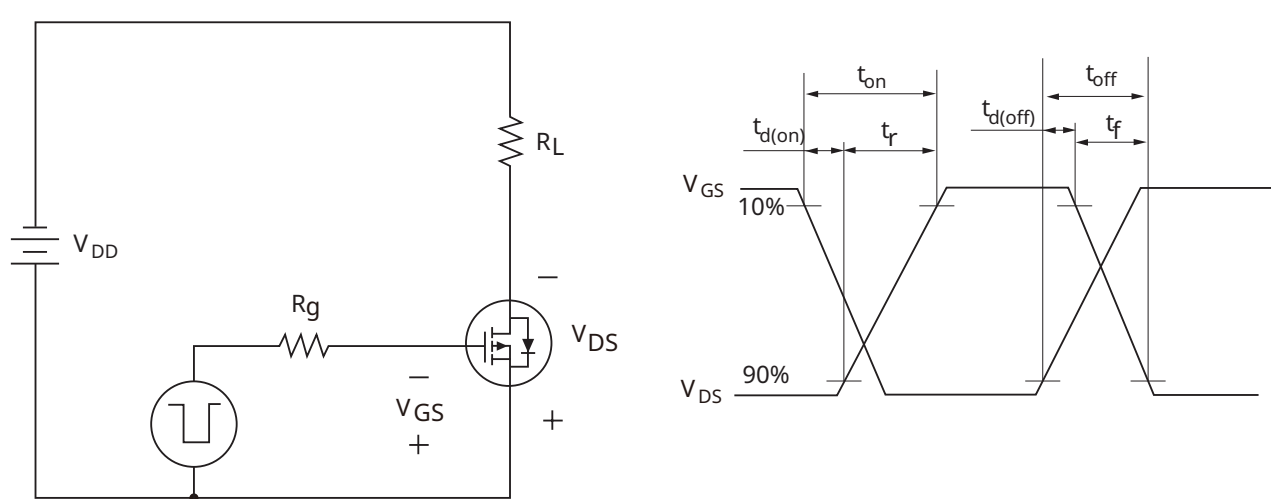
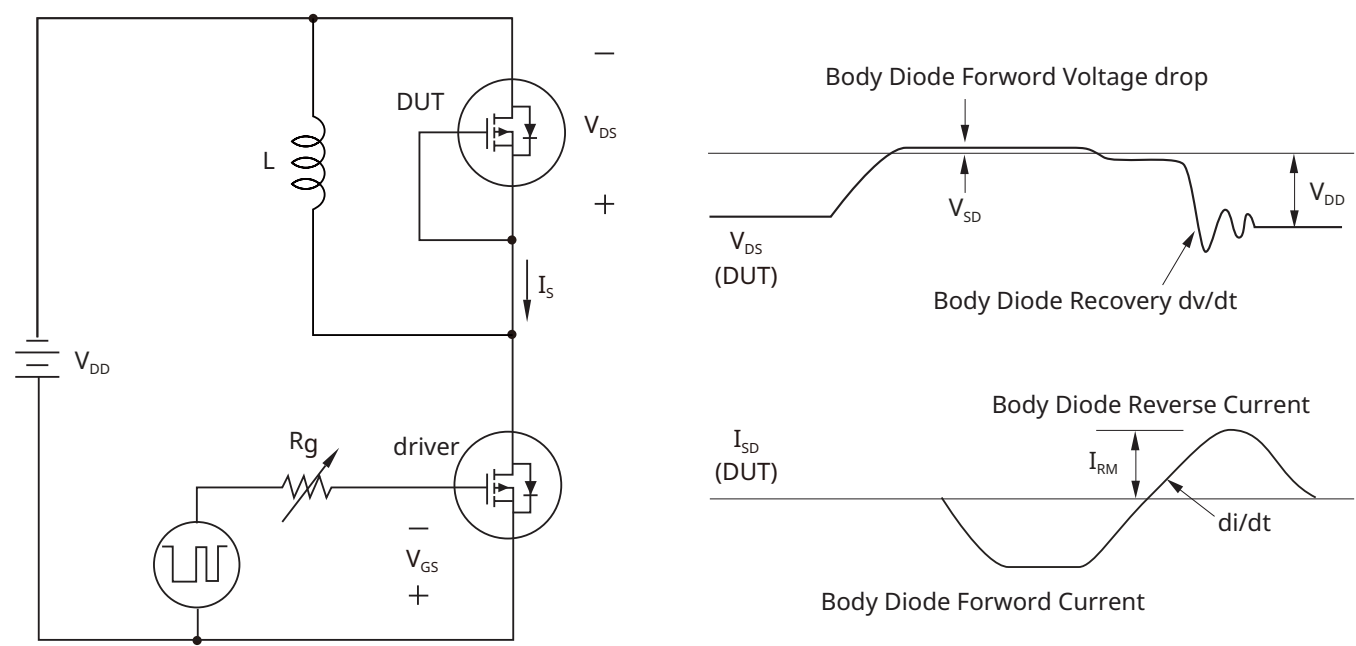
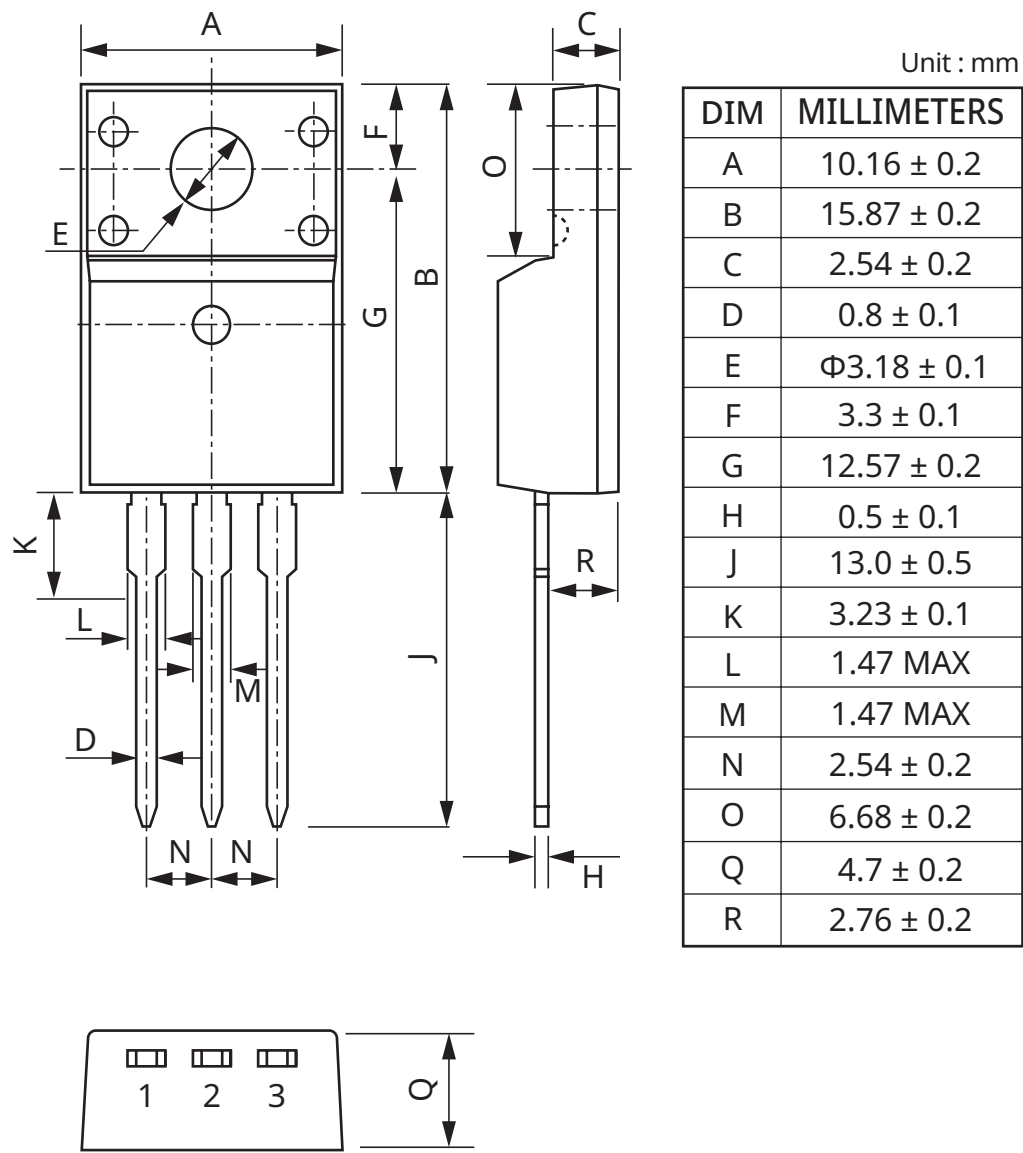


Fig19. Source - Drain Diode Reverse Recovery and dv/dt



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PACKAGE INFORMATION(TO-220IS(1))



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ORDERING INFORMATION

Part Number	Status	Compliance			Packing Type	Packing Qty
		AEC-Q	Pb-Free	Halogen Free		
KU170P04FT2-U/PF	Active	-	Y	-	Tube	50pcs

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