

N-Ch Trench MOSFET

KU400N10BT2

This Trench MOSFET has better characteristics, such as fast switching time, low on resistance, low gate charge and excellent avalanche characteristics.

This product has been designed and qualified to the appropriate AEC standard for use in automotive critical applications.

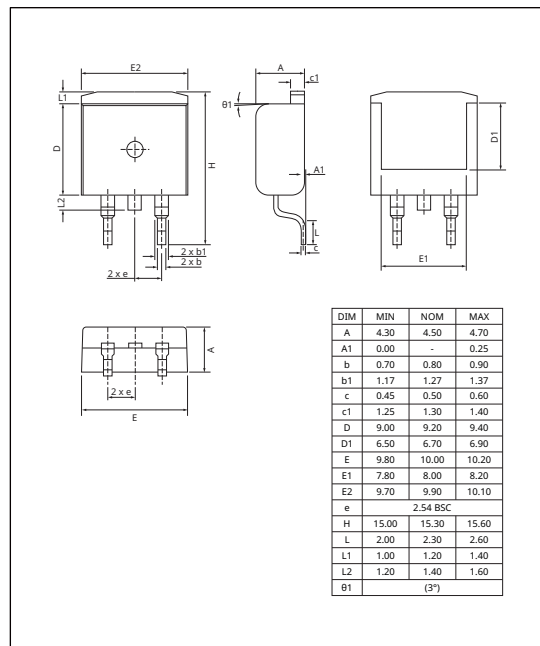
FEATURES

- $V_{DS}=100V$, $I_D=35A$
- Drain-Source ON Resistance :
 $R_{DS(ON)}(typ)=28m\Omega @V_{GS}=10V$

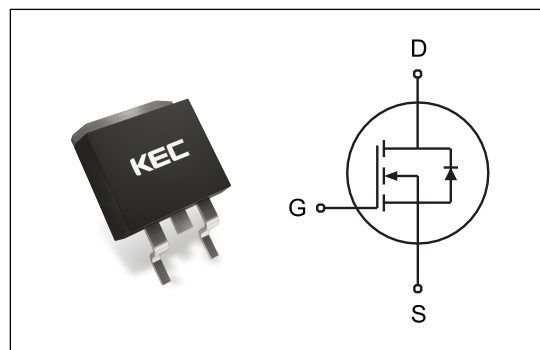
APPLICATION

- Automotive and General Purpose
- Power Switching

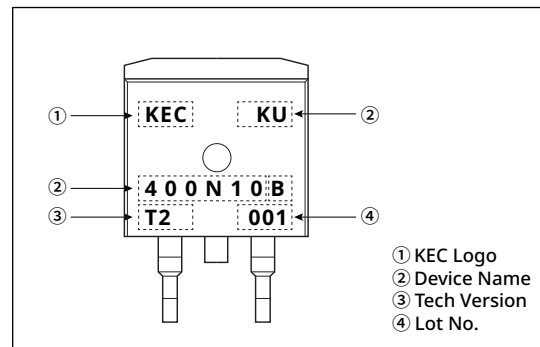
PACKAGE DIMENSION (D²PAK(2))



PIN CONFIGURATION



MARKING CODE



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N-Ch Trench MOSFET - KU400N10BT2

MAXIMUM RATING (T_J=25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V _{DSS}	100	V
Gate-Source Voltage		V _{GSS}	±20	V
Drain Current (Note 1,2)	@T _C =25°C	I _D	35	A
	@T _C =100°C	I _D	24.6	
	Pulsed	I _{DP}	100	
Single Pulsed Avalanche Energy (Note 3)		E _{AS}	31	mJ
Drain Power Dissipation	T _C =25°C	P _D	107	W
Maximum Junction Temperature		T _J	175	°C
Operation and Storage Temperature Range		T _{opr} , T _{stg}	-55 ~ 175	°C
Thermal Characteristics				
Thermal Resistance, Junction-to-Case		R _{thJC}	1.4	°C/W
Thermal Resistance, Junction-to-Ambient		R _{thJA}	62.5	°C/W

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ELECTRICAL CHARACTERISTICS(Tj=25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	100	-	-	V
Drain Cut-off Current	I _{DSS}	V _{DS} =100V, V _{GS} =0V, T _J =25°C	-	0.05	10	μA
		V _{DS} =100V, V _{GS} =0V, T _J =175°C	-	-	500	μA
Gate Threshold Voltage	V _{th}	V _{DS} =V _{GS} , I _D =1mA, T _J =25°C	2.0	3.0	4.0	V
		V _{DS} =V _{GS} , I _D =1mA, T _J =-55°C	-	-	4.4	V
		V _{DS} =V _{GS} , I _D =1mA, T _J =175°C	1.0	-	-	V
Gate Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	±2	±100	nA
Drain-Source ON Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =25A, T _J =25°C	-	-	40	mΩ
		V _{GS} =10V, I _D =25A, T _J =175°C	-	-	108	
Dynamic						
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1MHz (Note 4)	-	1960	2610	pF
Output Capacitance	C _{oss}		-	160	-	
Reverse Transfer Capacitance	C _{rss}		-	80	-	
Turn-on Delay time	t _{d(on)}	V _{DD} =30V, R _L =1.2Ω, V _{GS} =10V R _G =10Ω, T _J =25°C (Note 4)	-	22	-	ns
Turn-on Rise time	t _r		-	11	-	
Turn-off Delay time	t _{d(off)}		-	41	-	
Turn-off Fall time	t _f		-	11	-	
Total Gate Charge	Q _g	V _{DD} =30V, I _D =20A, V _{GS} =10V	-	35	-	nC
Gate-Source Charge	Q _{gs}		-	10	-	
Gate-Drain Charge	Q _{gd}		-	10	-	
Source-Drain Diode Ratings						
Continuous Source Current	I _S	V _{GS} < V _{th} , T _C =25°C	-	-	37	A
Diode Forward Voltage	V _{SD}	I _S =25A, V _{GS} =0V	-	0.9	1.2	V
Reverse Recovery Time	t _{rr}	I _S =25A, V _{GS} =0V, V _{DS} =30V, dI/dt=100A/μs	-	60	-	ns
Reverse Recovery Charge	Q _{rr}		-	0.15	-	μC

Note 1) Repetitive Rating : Pulse width limited by maximum junction temperature
Note 2) Pulse Test : Pulse width≤300μs, Duty cycle≤2%.
Note 3) I_D=26A, V_DS=30V, R_G=25Ω, V_GS=10V, L=70μH Starting T_J=25°C
Note 4) Essentially independent of operating temperature.

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Fig1. $I_D - V_{DS}$

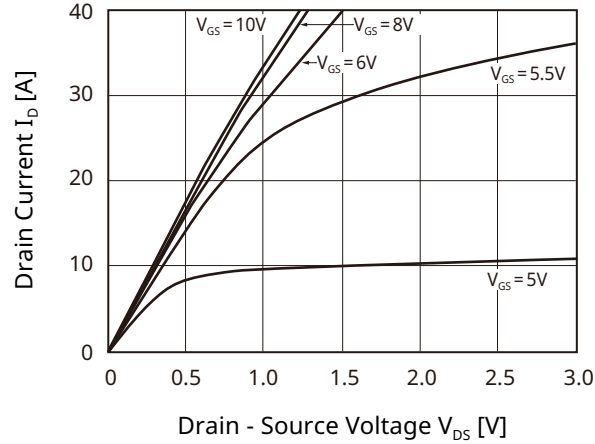


Fig2. $I_D - V_{DS}$

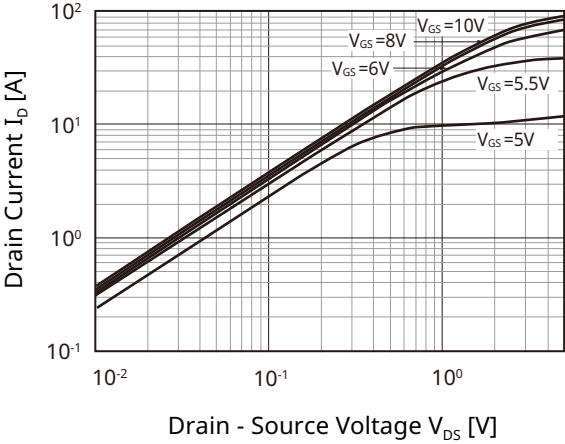


Fig3. $I_D - V_{GS}$

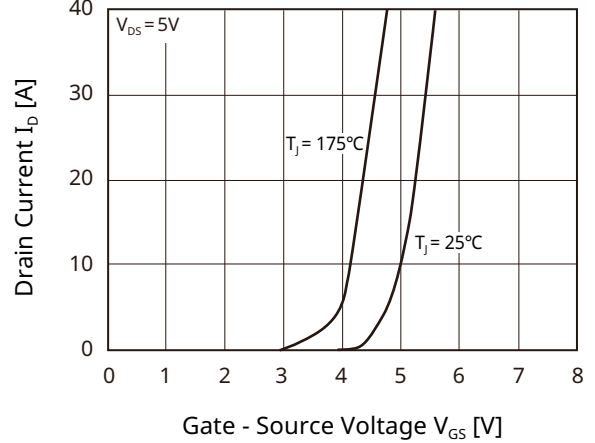


Fig4. $R_{DS(ON)} - I_D$

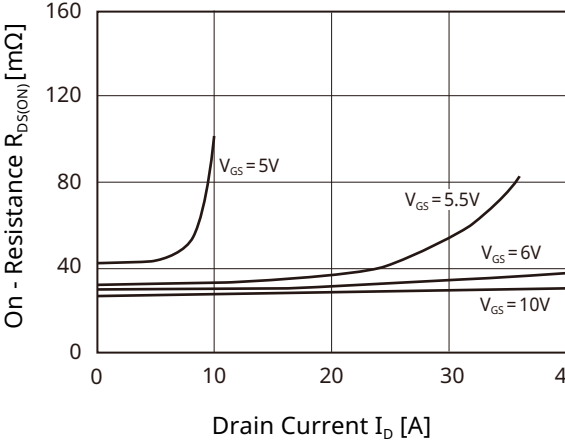


Fig5. $R_{DS(ON)} - V_{GS}$

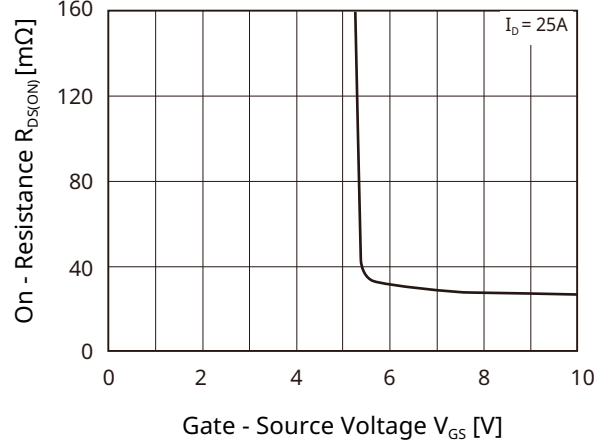
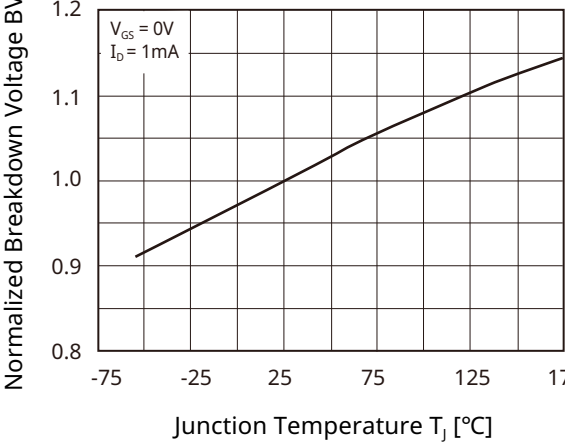
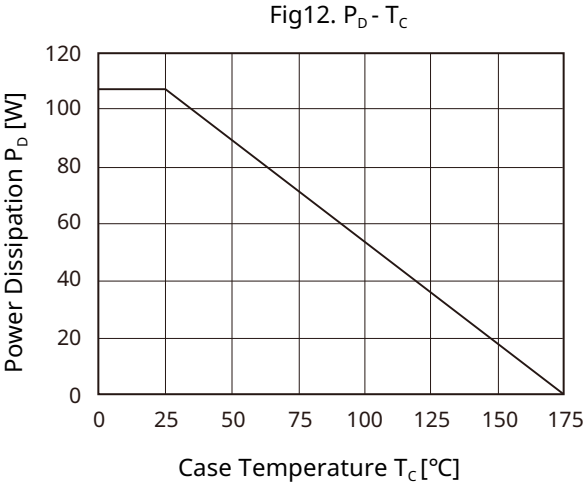
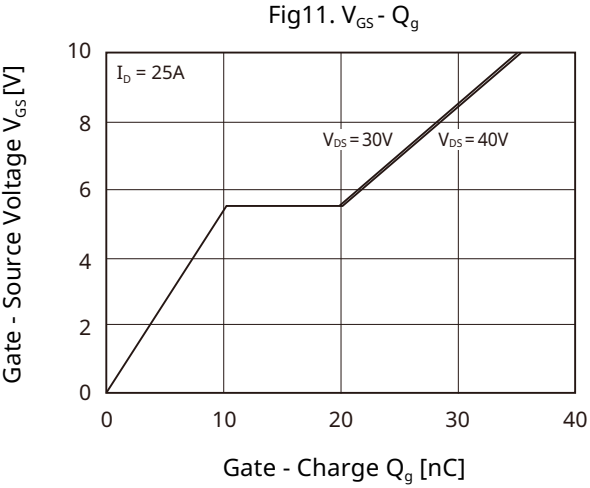
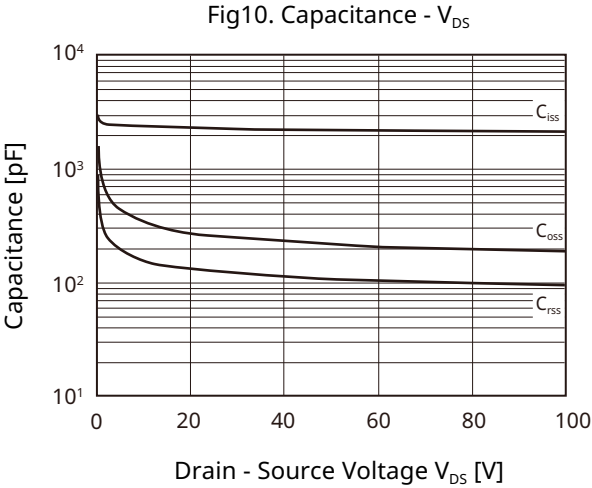
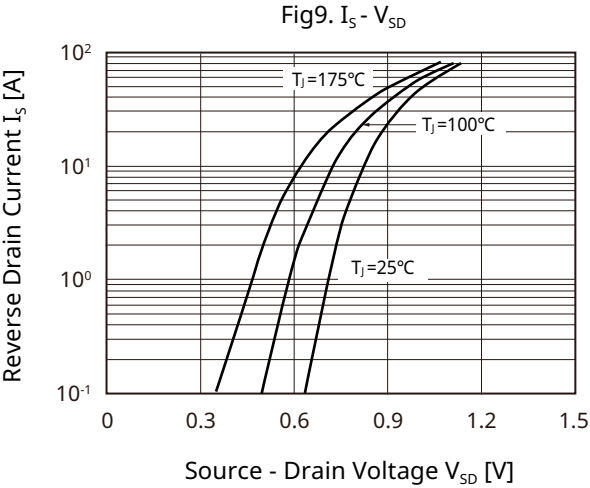
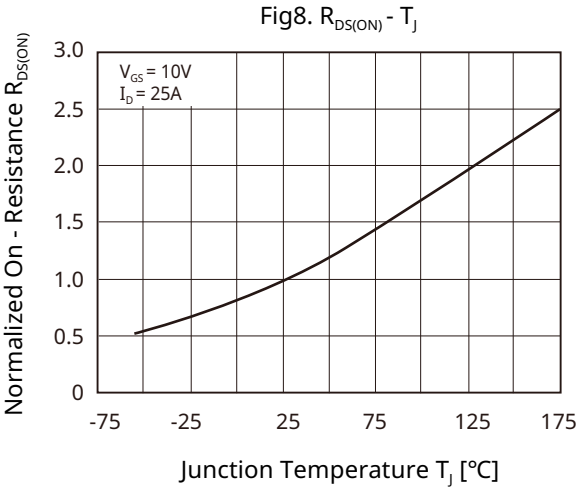
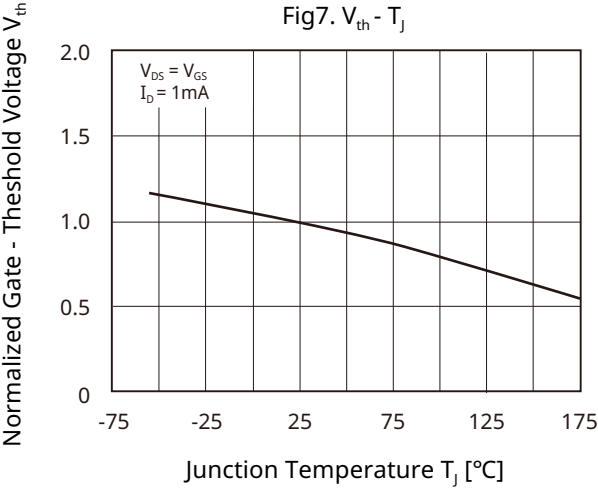


Fig6. $BV_{DSS} - T_J$



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Fig13. $I_D - T_J$

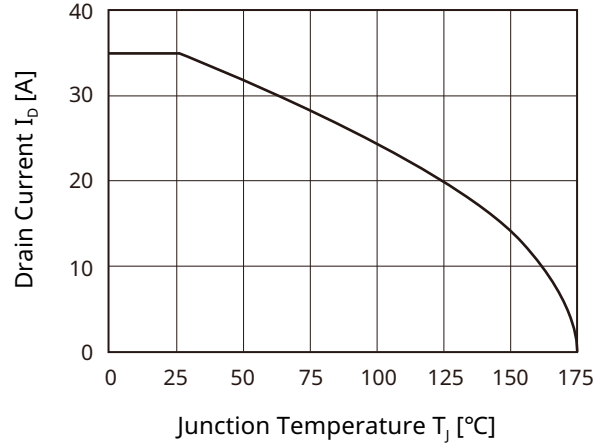


Fig14. Safe Opretation Area

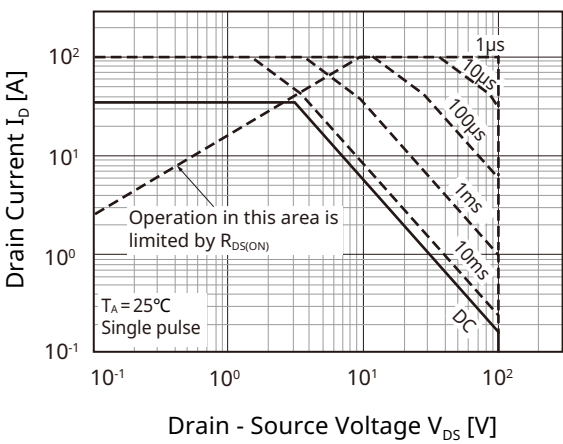
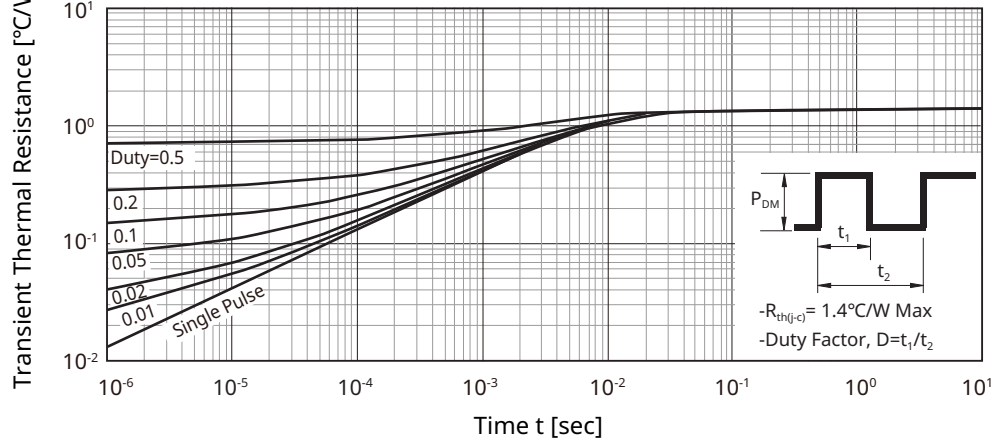


Fig15. Transient Rth Curve(J-C)



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Fig16. Gate Charge

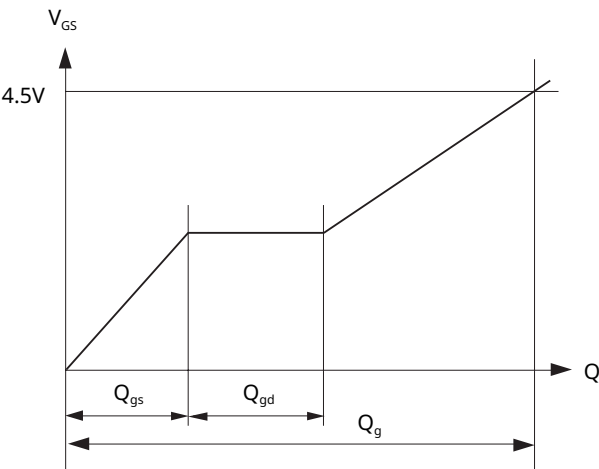
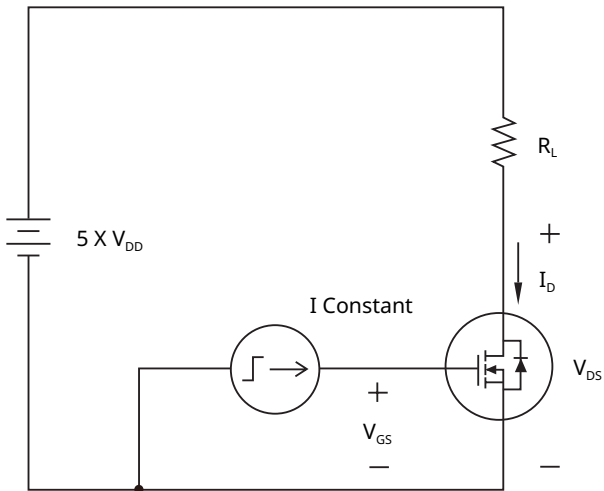
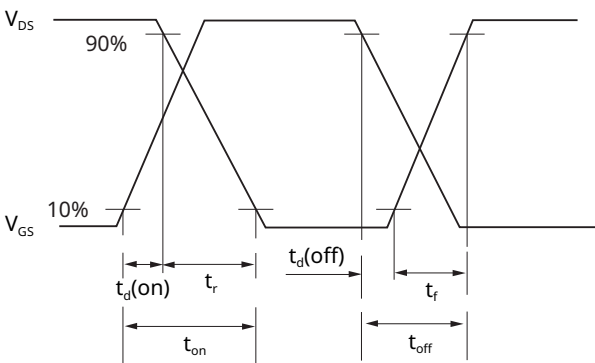
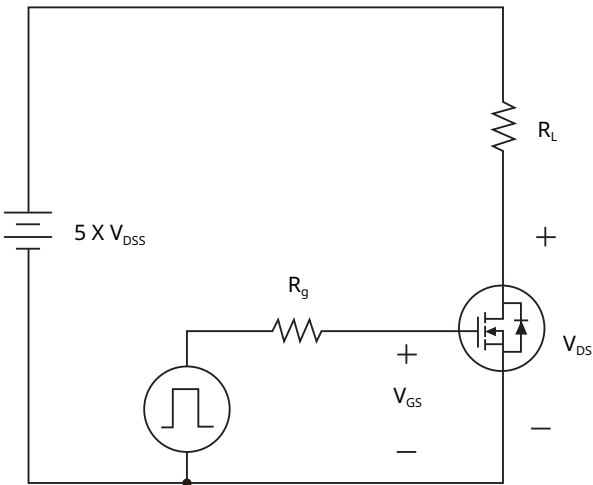


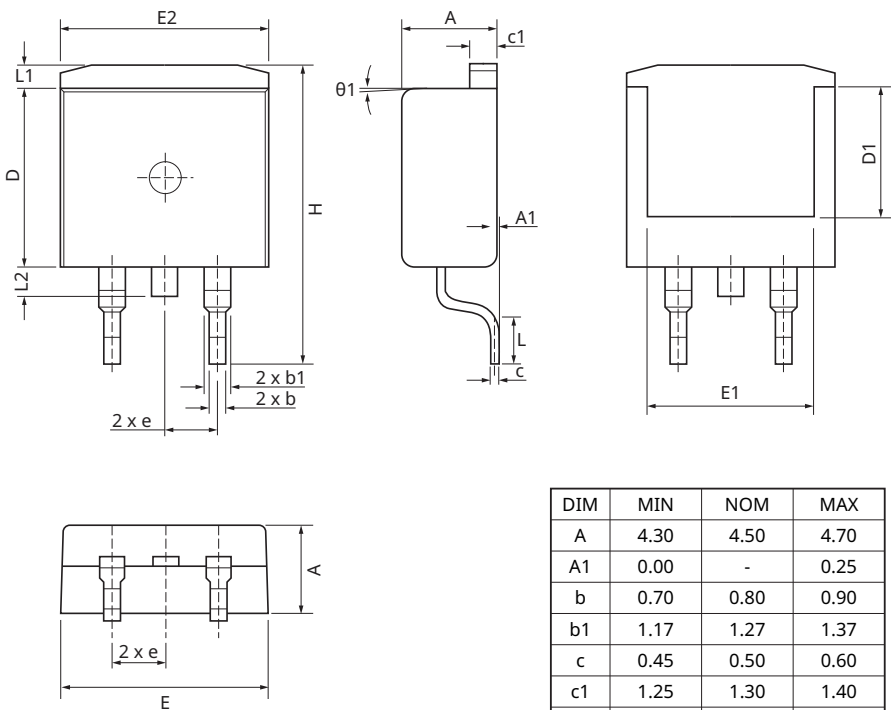
Fig17. Resistive Load Switching



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PACKAGE DIMENSION (D²PAK(2))



DIM	MIN	NOM	MAX
A	4.30	4.50	4.70
A1	0.00	-	0.25
b	0.70	0.80	0.90
b1	1.17	1.27	1.37
c	0.45	0.50	0.60
c1	1.25	1.30	1.40
D	9.00	9.20	9.40
D1	6.50	6.70	6.90
E	9.80	10.00	10.20
E1	7.80	8.00	8.20
E2	9.70	9.90	10.10
e	2.54 BSC		
H	15.00	15.30	15.60
L	2.00	2.30	2.60
L1	1.00	1.20	1.40
L2	1.20	1.40	1.60
$\theta 1$	(3°)		

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ORDERING INFORMATION

Part Number	Status	Compliance			Packing Type	Packing Qty
		AEC-Q	Pb-Free	Halogen Free		
KU400N10BT2-RTH/HU	Active	Y	Y	Y	Reel	800

PRECAUTION ON USING KEC PRODUCTS

1. The products described in this data are intended to be used in general-purpose electronic equipment.
(Office equipment, telecommunication equipment, measuring equipment, home appliances)
2. When you intend to use these products with equipment or device which require an extremely high of reliability and special applications (such as automobile, air travel aerospace, transportation equipment, life support, system and safety devices) in which special quality and reliability and the failure or malfunction of products may directly jeopardize or harm the human body or damage to property and any application other than the standard application intended, please be sure to consult with our sales representative in advance.
3. On designing your application, please use product within the ranges guaranteed by KEC for maximum rating, operating supply voltage range, heat radiation characteristics and other characteristics. User shall be responsible for failure or damage when used beyond the guaranteed ranges.
4. The technical information described in this data is limited to showing representative characteristics and applied circuit examples of the products and it does not constitute the warranting of industrial property, the granting of relative rights, or the granting of any license.
5. What are described in the data may be changed without any prior notice to reflect new technical development. Please confirm that you have received the latest product standards or specification before final design, purchase or use.
6. Although KEC is continuously working to improve product reliability and quality, semiconductors can break down and malfunction due to various factors. Therefore, in order to prevent personal injury or fire arising from failure, please take safety measures such as complying with the derating characteristics, implementing redundant and fire prevention designs, and utilizing backups and fail-safe procedures. KEC shall have no responsibility for any damages arising out of the use of our Products beyond the rating specified by KEC.

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