

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 LED Lighting and DC/DC Converters.

FEATURES

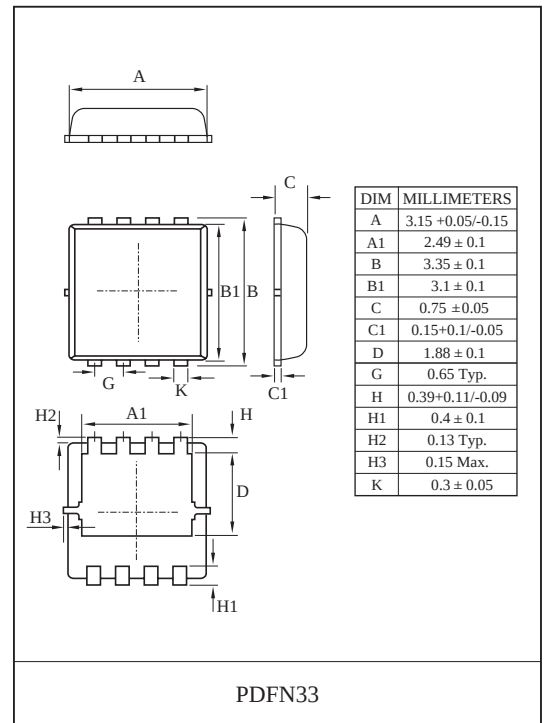
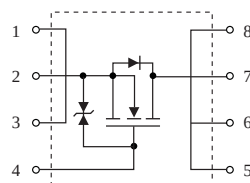
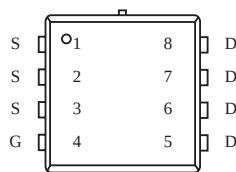
- $V_{DSS(Min.)} = 100V$, $I_D = 5.4A$
- Drain-Source ON Resistance : $R_{DS(ON)} = 0.36 \Omega(max)$ @ $V_{GS} = 10V$
- $Q_g(typ.) = 2.3nC$ (@ $V_{GS} = 4.5V$)

MAXIMUM RATING ($T_C = 25^\circ C$)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	± 16	V
Drain Current	$T_C = 25^\circ C$	I_D	5.4	A
	$T_C = 100^\circ C$		3.4	
	$T_a = 25^\circ C$		2.0	
	Pulsed (Note1)	I_{DP}	9.8	
Peak Diode Recovery dv/dt (Note 2)		dv/dt	4.5	V/ns
Drain Power Dissipation	$T_C = 25^\circ C$	P_D	21.5	W
	Derate above $25^\circ C$		0.17	W/ $^\circ C$
	$T_a = 25^\circ C$		3.1	W
Maximum Junction Temperature		T_j	150	$^\circ C$
Storage Temperature Range		T_{stg}	-55 150	$^\circ C$
Thermal Characteristics				
Thermal Resistance, Junction-to-Case		R_{thJC}	5.8	$^\circ C/W$
Thermal Resistance, Junction-to-Ambient		R_{thJA}	40*	$^\circ C/W$

* : Surface Mounted on $25mm \times 25mm$ FR4 Board , $t \leq 10sec$.

PIN CONNECTION



KU3600N10RZ

ELECTRICAL CHARACTERISTICS (T_C=25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Static							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250 μA, V _{GS} =0V	100	-	-	V
Breakdown Voltage Temperature Coefficient		Δ BV _{DSS} / Δ T _j	I _D =250 μA , Referenced to 25°C	-	0.1	-	V/°C
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 μA	1.0	-	2.5	V
Gate Leakage Current		I _{GSS}	V _{GS} =±10V, V _{DS} =0V	-	-	±10	μA
Drain-Source ON Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =2.7A	-	0.30	0.36	Ω
			V _{GS} =4.5V, I _D =2.7A		-	0.44	
Dynamic							
Total Gate Charge	V _{GS} =10V	Q _g	V _{DS} =50V, I _D =1.7A V _{GS} =10V (Note3,4)	-	4.5	-	nC
	V _{GS} =4.5V			-	2.3	3.0	
Gate-Source Charge		Q _{gs}		-	0.6	-	
Gate-Drain Charge		Q _{gd}		-	1.2	-	
Turn-on Delay time		t _{d(on)}	V _{DD} =50V, I _D =1.7A R _G =6Ω (Note3,4) V _{GS} =10V	-	10	-	ns
Turn-on Rise time		t _r		-	5	-	
Turn-off Delay time		t _{d(off)}		-	35	-	
Turn-off Fall time		t _f		-	6	-	
Input Capacitance		C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	-	210	-	pF
Output Capacitance		C _{oss}		-	30	-	
Reverse Transfer Capacitance		C _{rss}		-	13	-	
Source-Drain Diode Ratings							
Continuous Source Current		I _S	V _{GS} <V _{th}	-	-	1	A
Pulsed Source Current		I _{SP}		-	-	4	
Diode Forward Voltage		V _{SD}	I _S =1A, V _{GS} =0V	-	-	1.4	V
Reverse Recovery Time		t _{rr}	I _S =1.7A, V _{GS} =0V,	-	30	-	ns
Reverse Recovery Charge		Q _{rr}	dIs/dt=100A/μs	-	40	-	nC

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

Note 2) I_S ≤ 1.7A, dI/dt ≤ 100A/μs, V_{DD} ≤ BV_{DSS}, Starting T_j = 25°C.

Note 3) Pulse Test : Pulse width ≤ 300μs, Duty Cycle ≤ 2%.

Note 4) Essentially independent of operating temperature.

Marking

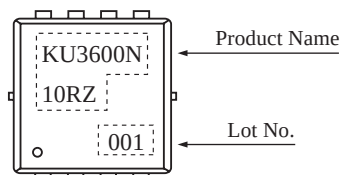


Fig1. $V_{DS} - I_D$

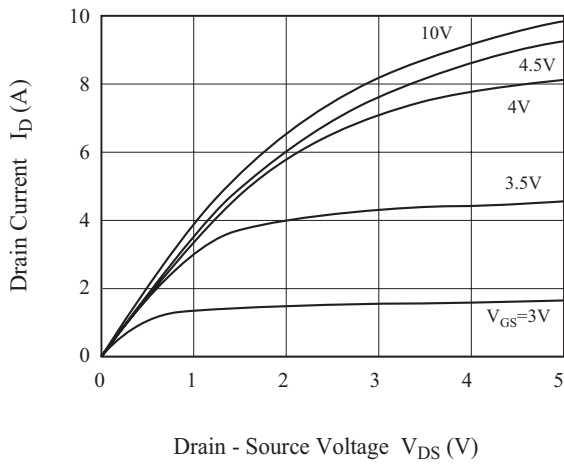


Fig2. $R_{DS(ON)} - I_D$

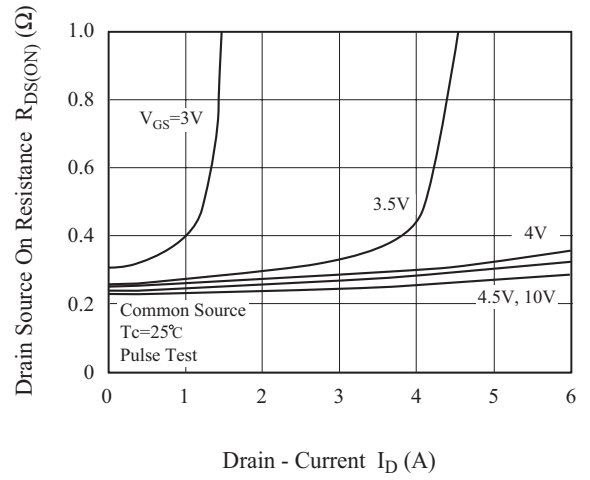


Fig3. $I_D - V_{GS}$

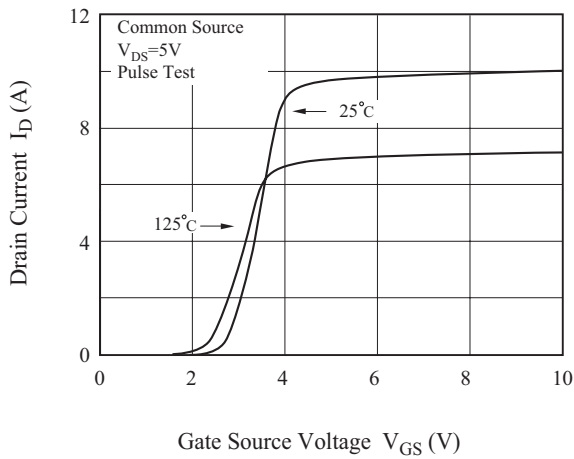


Fig4. $R_{DS(ON)} - T_j$

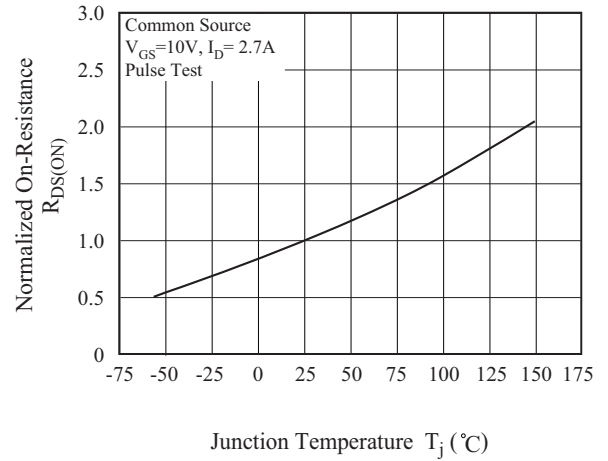


Fig5. $V_{th} - T_j$

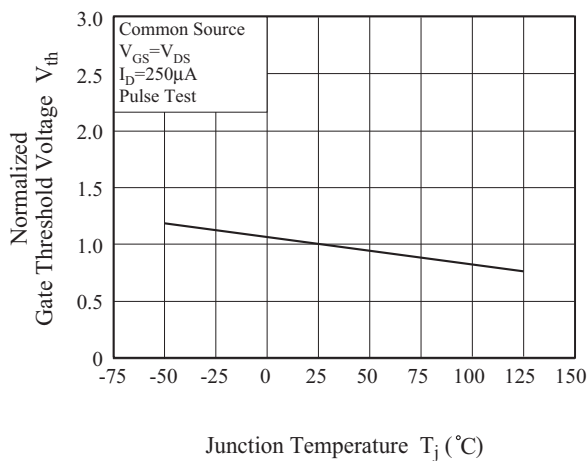


Fig6. $I_S - V_{SDF}$

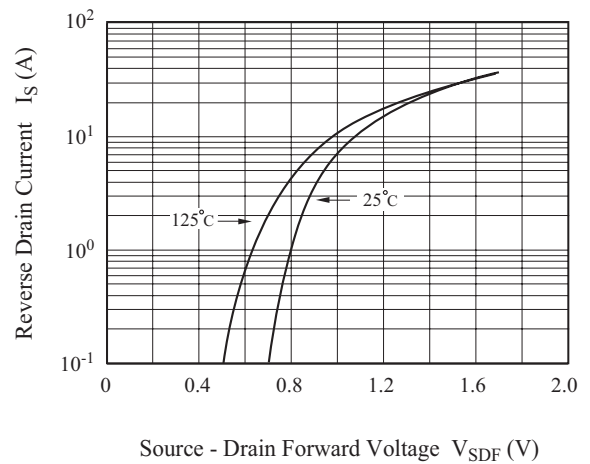


Fig7. $BV_{DSS} - T_j$

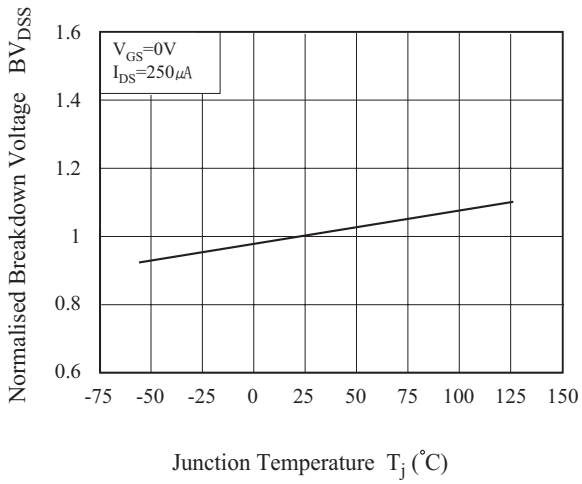


Fig8. $C - V_{DS}$

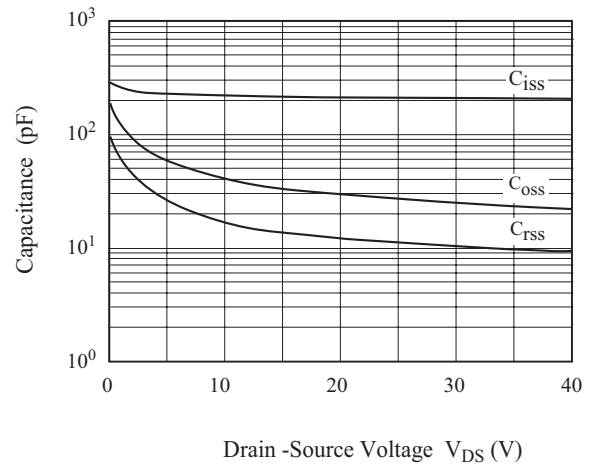


Fig9. $Q_g - V_{GS}$

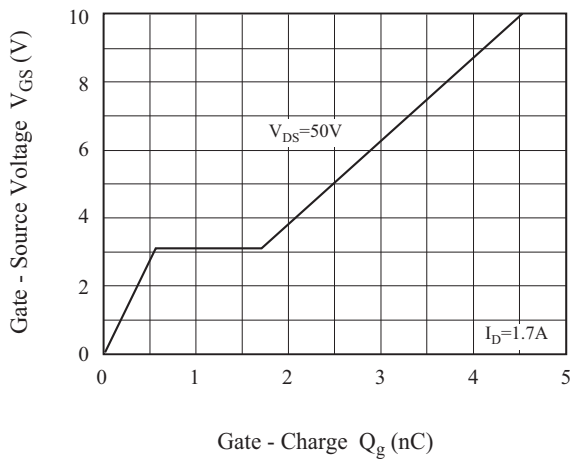


Fig10. Safe Operation Area

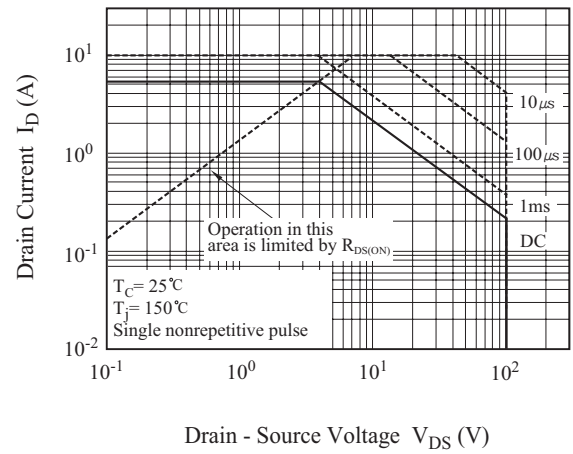


Fig11. Transient Thermal Response Curve

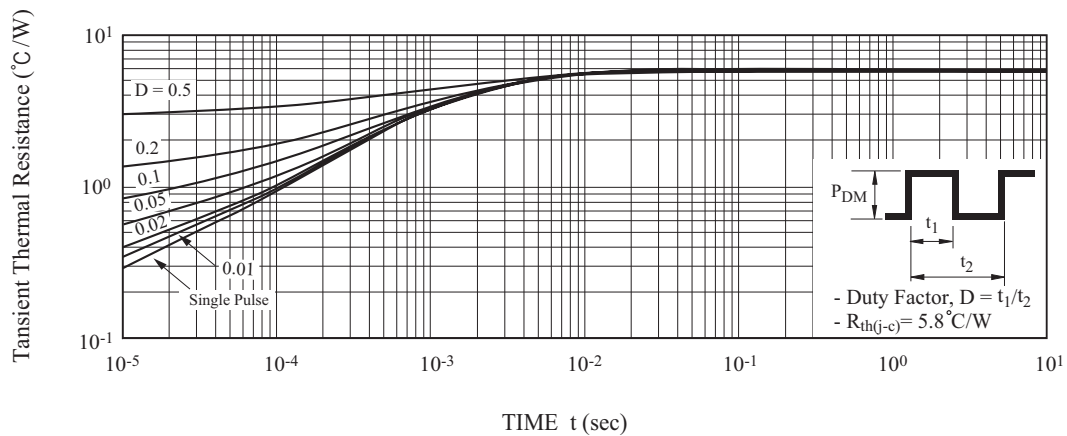


Fig12. Gate Charge

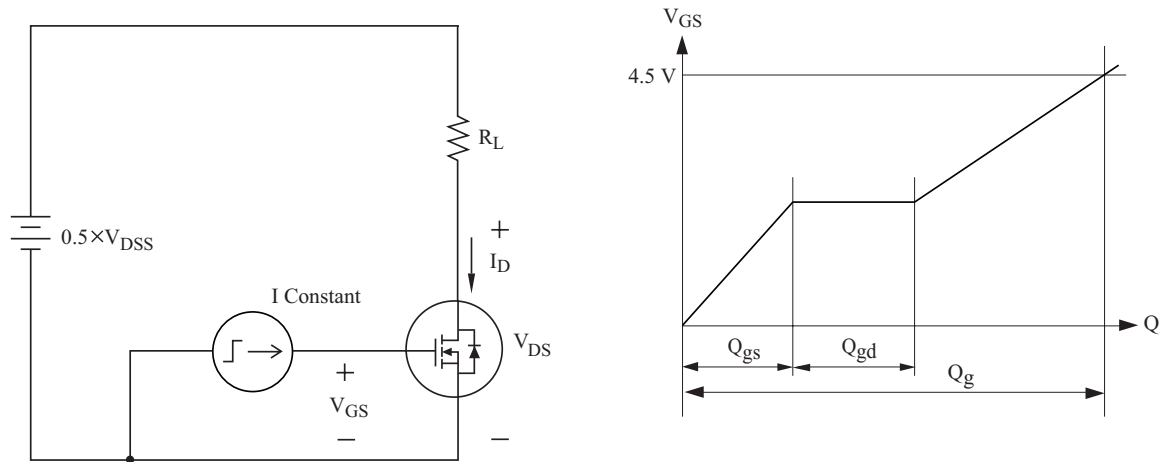


Fig13. Resistive Load Switching

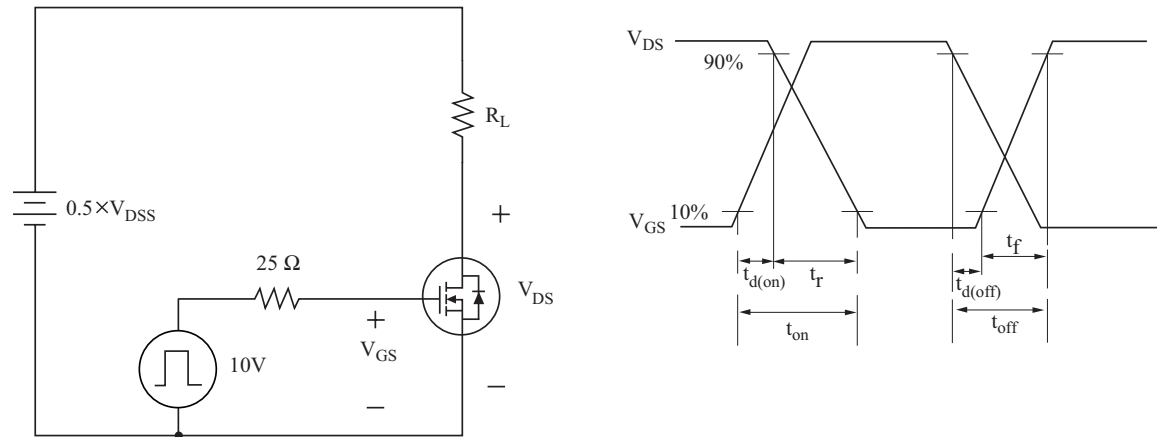


Fig14. Source - Drain Diode Reverse Recovery and dv/dt

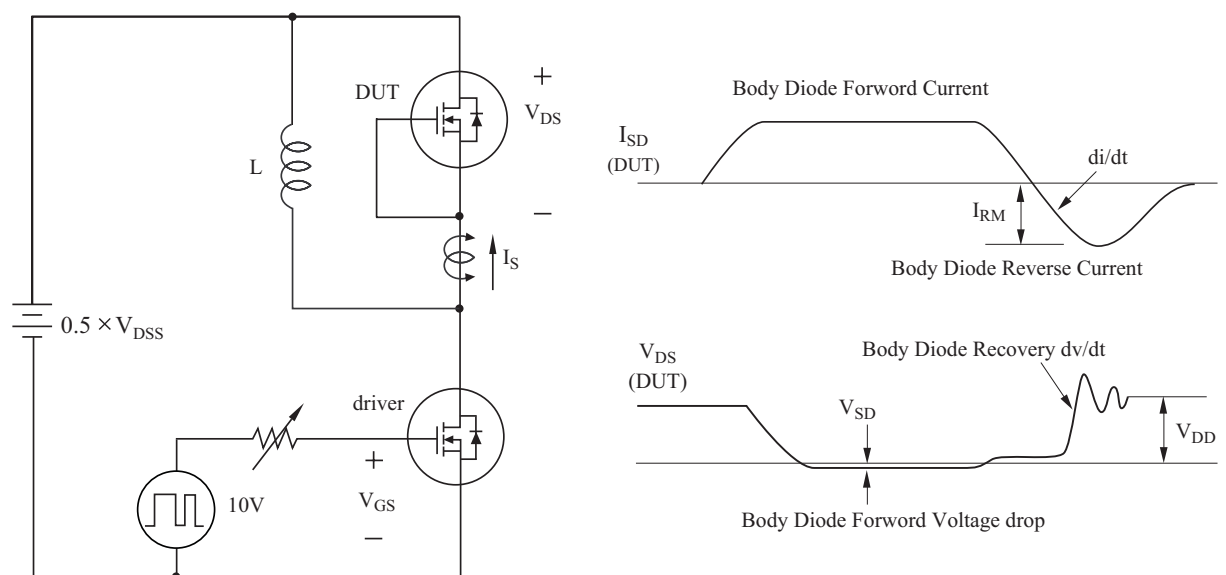


Fig 15. Recommended Pad Dimension

