

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

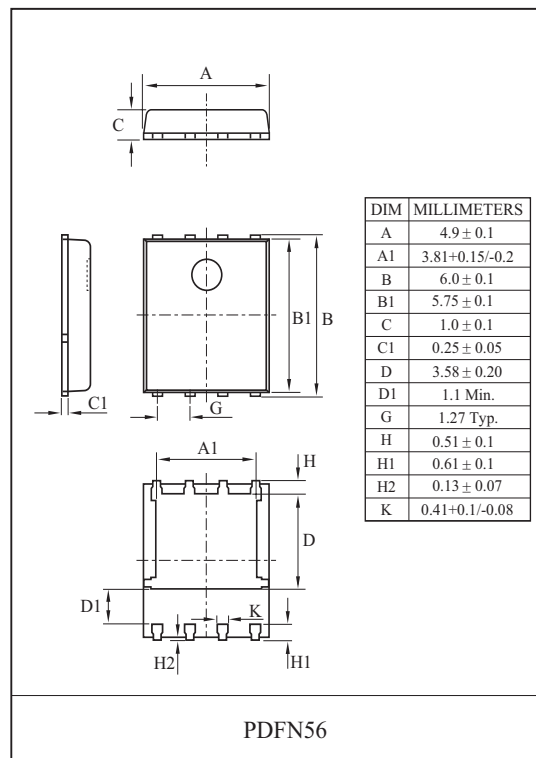
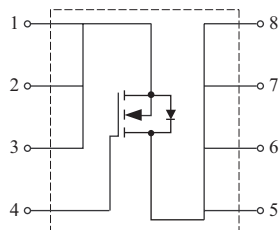
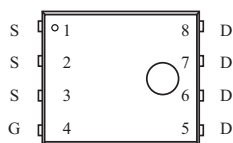
- $V_{DS} = 30V$, $I_D = 100A$
- Drain-Source ON Resistance :
 $R_{DS(ON)} = 2.4m\Omega (Max.) @ V_{GS} = 10V$

MAXIMUM RATING (Tc=25 °C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current (Note 1)	@T _C =25	I_D	100	A
	@T _C =100		63	
	@T _a =25		32	
	Pulsed (Note 4)	I_{DP}	400	
Single Pulsed Avalanche Energy (Note 2)		E_{AS}	288	mJ
Repetitive Avalanche Energy (Note 1,4)		E_{AR}	14	mJ
Peak Diode Recovery dv/dt (Note 3)		dv/dt	4.5	V/ns
Drain Power Dissipation	Tc=25	P_D	40	W
	Derate above 25		0.32	W/
	@T _a =25		4.2	W
Maximum Operating Junction Temperature		T_j	150	
Storage Temperature Range		T_{stg}	-55 ~ 150	
Thermal Characteristics				
Thermal Resistance, Junction-to-Case		R_{thJC}	3.16	/W
Thermal Resistance, Junction-to-Ambient		R_{thJA}	30*	/W

* : Surface mounted on 25mm × 25mm FR4 Board, t ≤ 10 sec.

PIN CONNECTION



KU024N03C

ELECTRICAL CHARACTERISTICS (T_j=25 °C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250 μA, V _{GS} =0V	30	-	-	V
Breakdown Voltage Temperature Coefficient	ΔBV _{DSS} / ΔT _j	I _D =1mA, Referenced to 25	-	0.03	-	V/
Drain Cut-off Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V,	-	-	10	μA
Gate Threshold Voltage	V _{th}	V _{DS} =V _{GS} , I _D =250 μA	1.2	-	2.5	V
Gate Leakage Current	I _{GSS}	V _{GS} = ± 20V, V _{DS} =0V	-	-	± 100	μA
Drain-Source ON Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =30A (Note4)	-	1.95	2.4	mΩ
		V _{GS} =4.5V, I _D =20A (Note4)	-	2.6	3.3	
Dynamic						
Total Gate Charge	Q _g	V _{DS} =15V, I _D =30A V _{GS} =10V (Note4)	-	74	-	nC
Gate-Source Charge	Q _{gs}		-	10	-	
Gate-Drain Charge	Q _{gd}		-	13	-	
Turn-on Delay time	t _{d(on)}	V _{DD} =15V I _D =1A R _G =3.3Ω (Note4)	-	25	-	ns
Turn-on Rise time	t _r		-	17	-	
Turn-off Delay time	t _{d(off)}		-	91	-	
Turn-off Fall time	t _f		-	21	-	
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, f=1.0MHz	-	4000	-	pF
Output Capacitance	C _{oss}		-	590	-	
Reverse Transfer Capacitance	C _{rss}		-	400	-	
Source-Drain Diode Ratings						
Continuous Source Current	I _S	V _{GS} <V _{th}	-	-	23	A
Pulsed Source Current	I _{SP}	V _{GS} <V _{th} (Note4)	-	-	92	
Diode Forward Voltage	V _{SD}	I _S =2.0A, V _{GS} =0V	-	-	1.2	V

Note 1) Limited by junction temperature.

Note 2) L=100 μH, I_S=76A, V_{DD}=25V, R_G=25Ω, Starting T_j=25 °C.

Note 3) I_S ≤ 23A, V_{DD} ≤ BV_{DSS}, Starting T_j=25 °C.

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

Marking

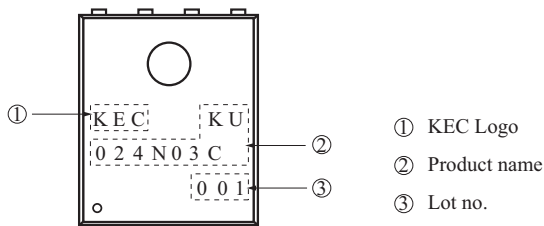


Fig1. $V_{DS} - I_D$

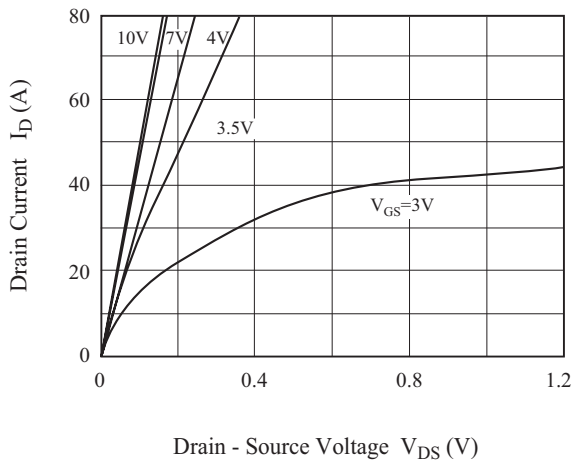


Fig2. $R_{DS(ON)} - I_D$

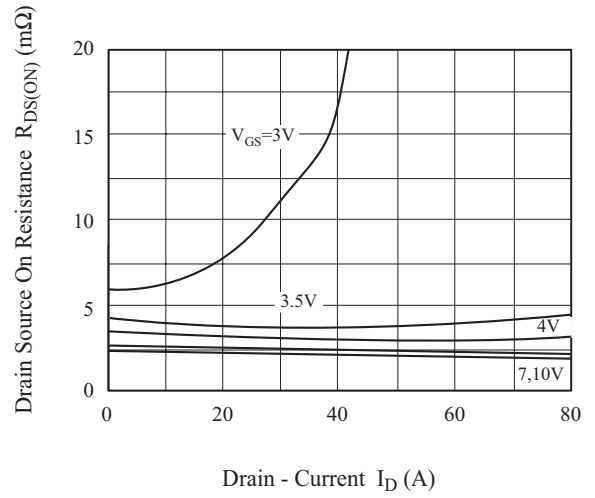


Fig3. $I_D - V_{GS}$

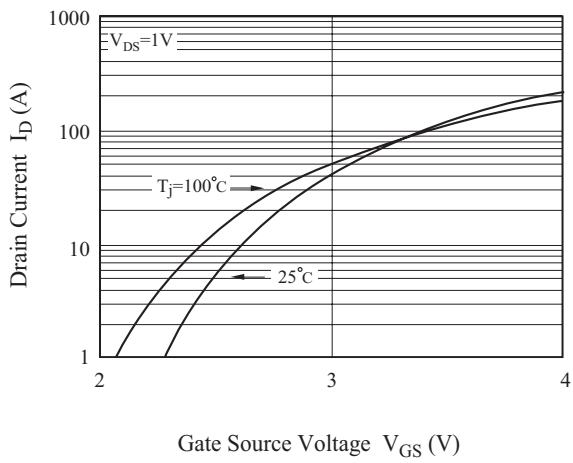


Fig4. $R_{DS(ON)} - T_j$

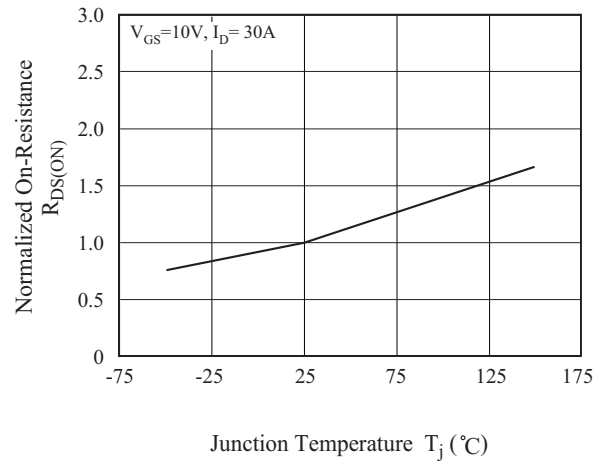


Fig5. $V_{th} - T_j$

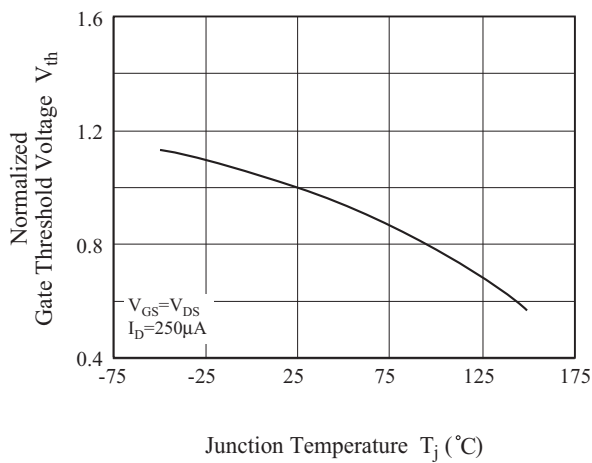


Fig6. $I_S - V_{SDF}$

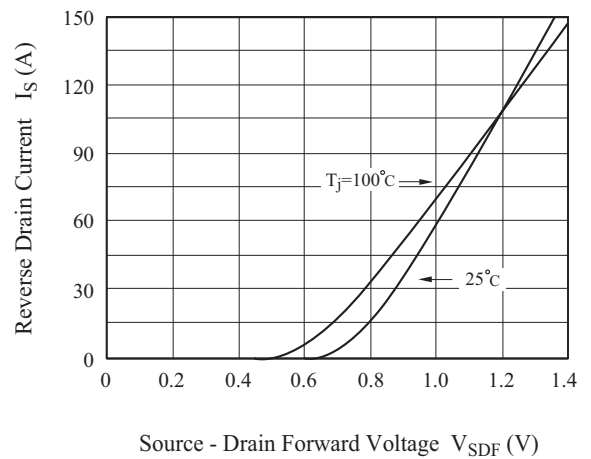


Fig7. $BV_{DSS} - T_j$

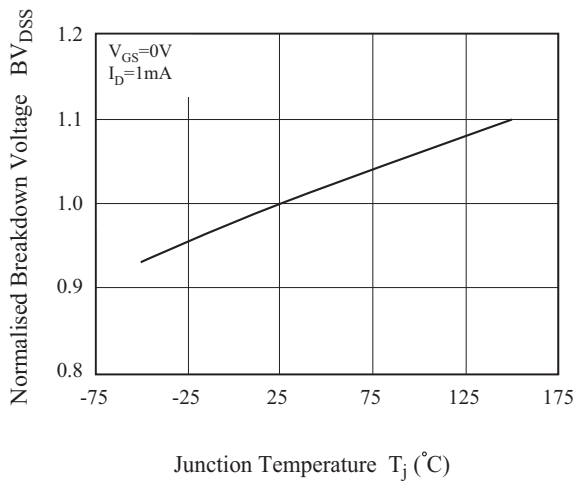


Fig8. $C - V_{DS}$

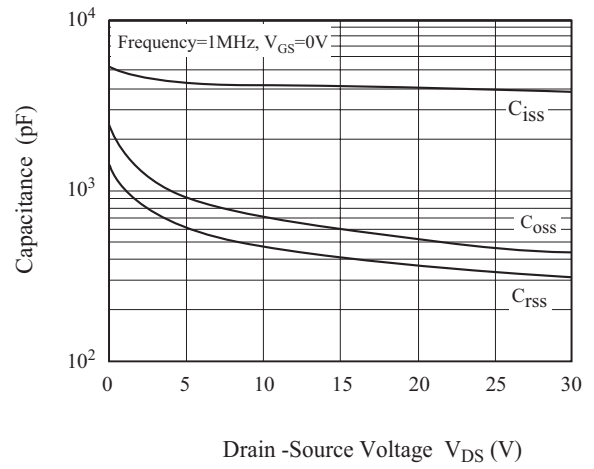


Fig9. $Q_g - V_{GS}$

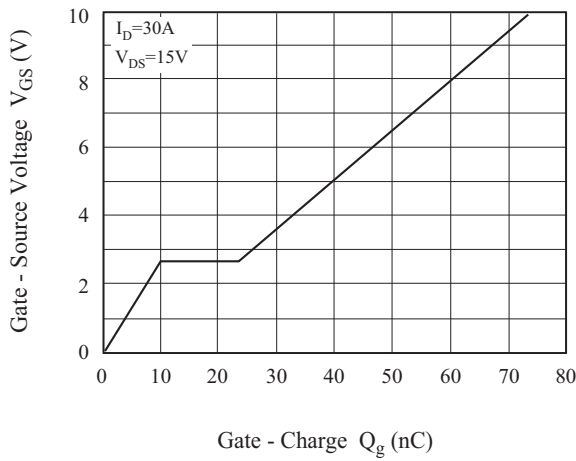


Fig10. Safe Operation Area

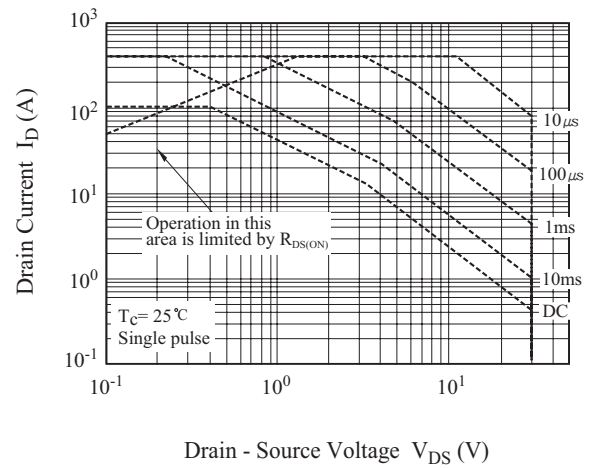


Fig11. Transient Thermal Response Curve

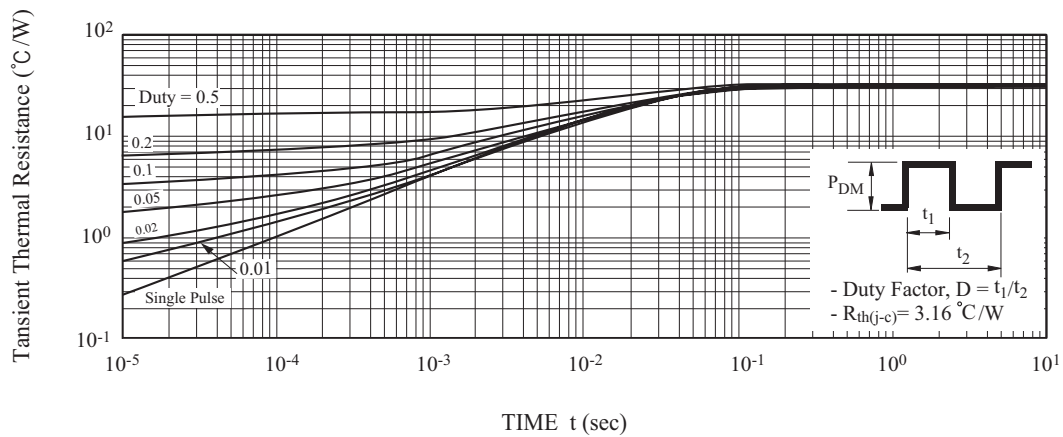


Fig12. Gate Charge

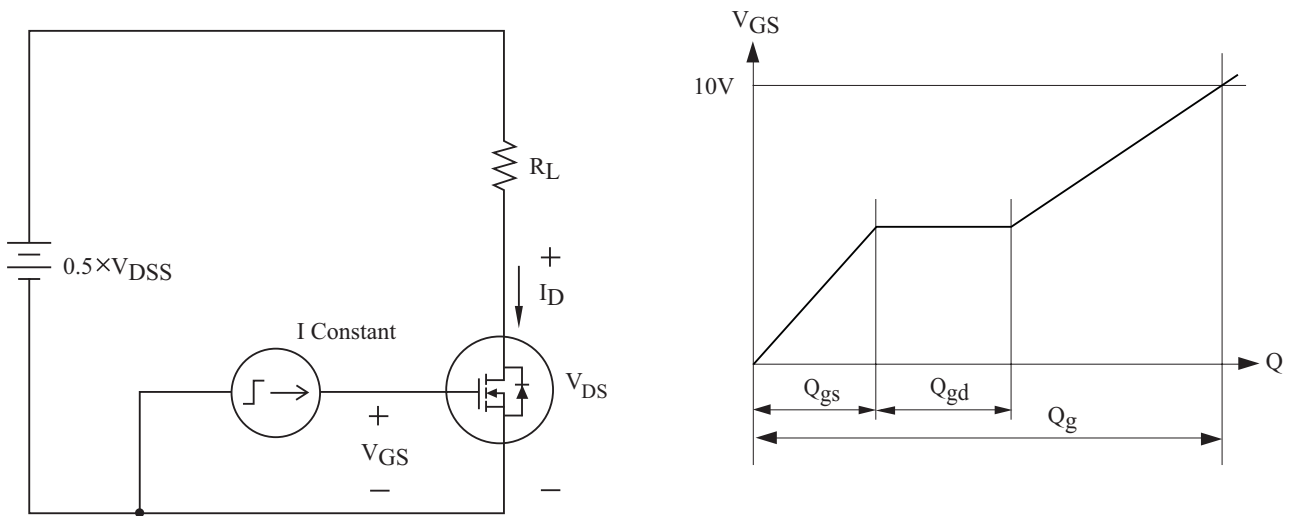


Fig13. Single Pulsed Avalanche Energy

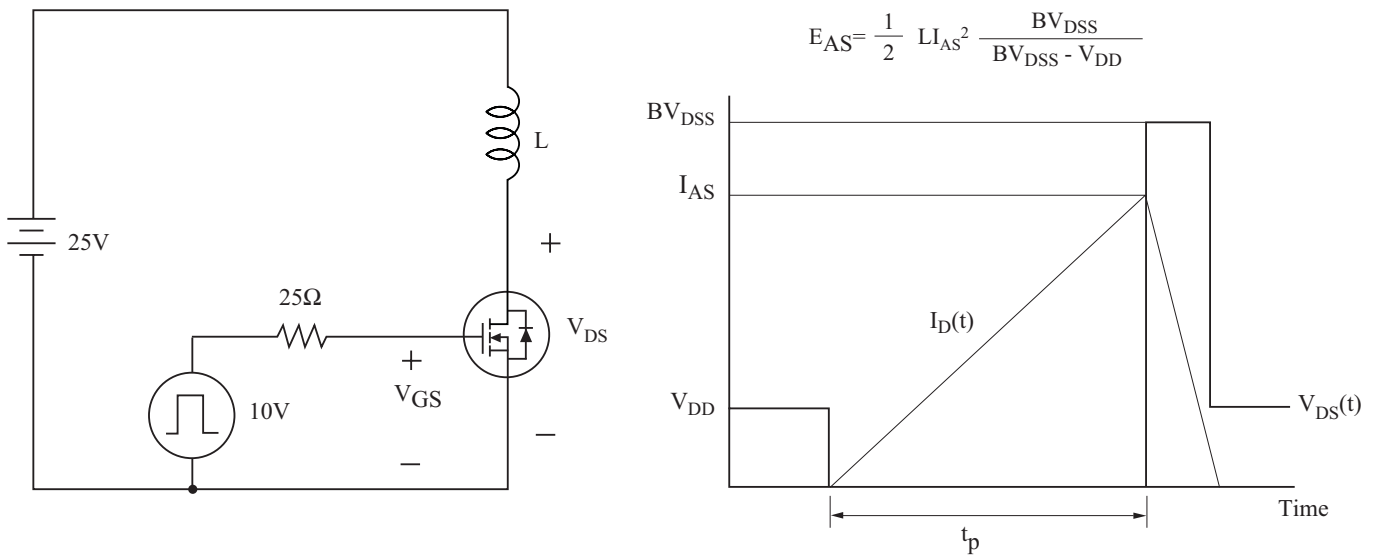


Fig14. Resistive Load Switching

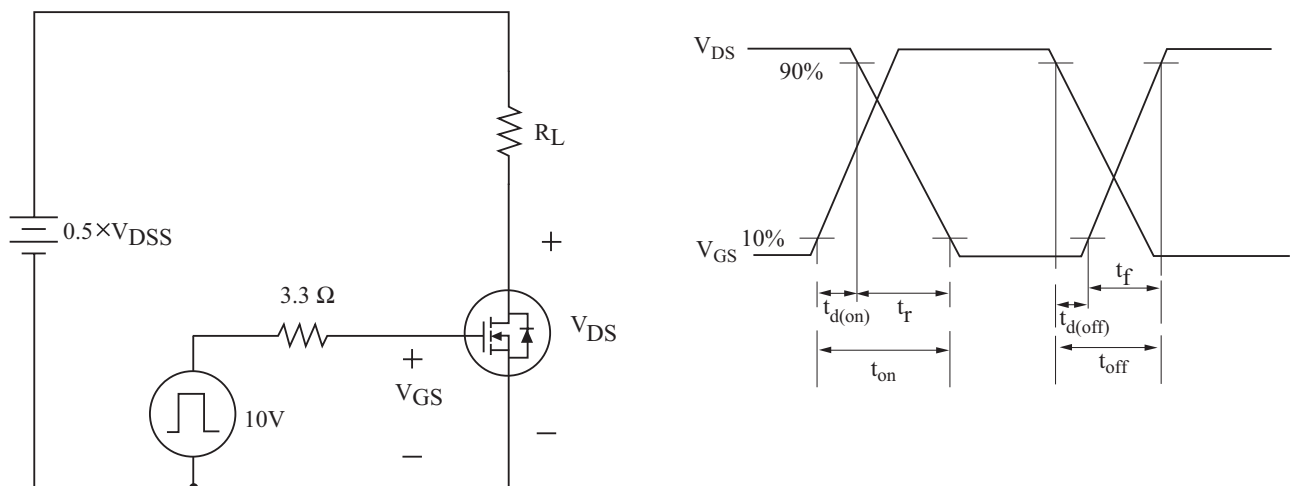


Fig15. Source - Drain Diode Reverse Recovery and dv/dt

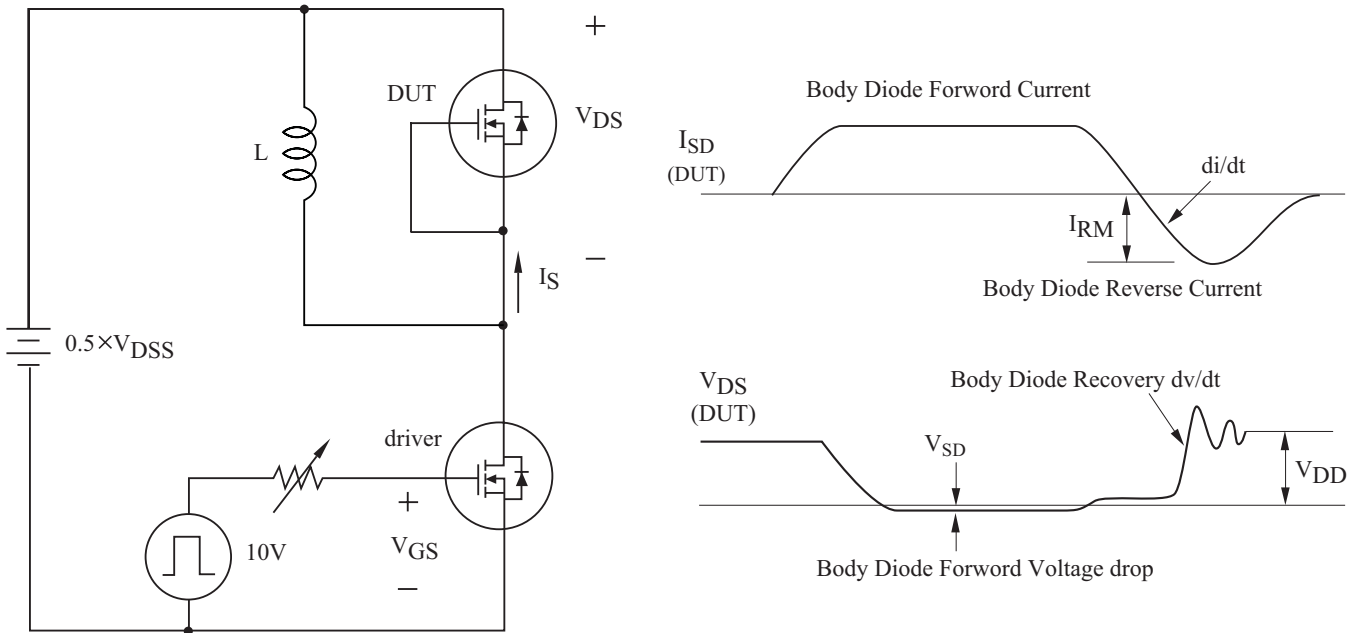


Fig16. Recommended Pad Dimension

