

N-Channel MOSFET

Features

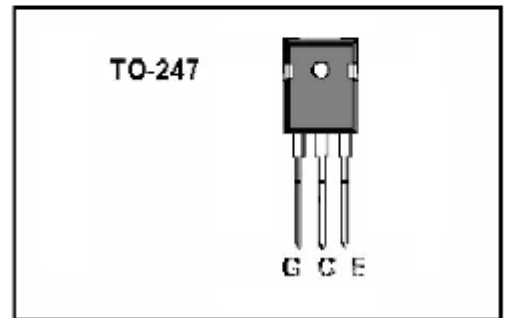
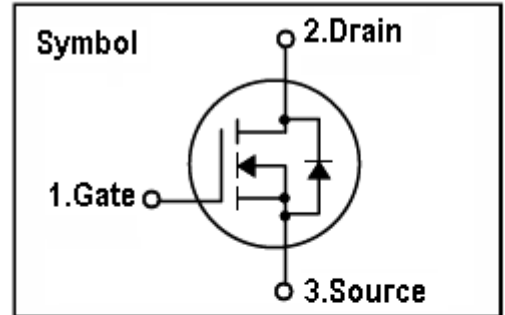
- 1500V,4A,Rds(on) <7Ω@Vgs=10V
- High Ruggedness
- Fast Switching
- 100% Avalanche Tested

General Description

This Power MOSFET is produced using DAXIN's advanced Planar MOS Technology. This latest technology has been especially designed to minimize on-state resistance, have a high rugged avalanche characteristics.

Applications

- Switching application



Absolute Maximum Ratings

Symbol	Parameter	Value	Units
V _{DSS}	Drain-Source Voltage	1500	V
I _D	Continuous Drain Current (T _C =25°C)	4	A
	Continuous Drain Current (T _C =100°C)	2.5	A
I _{DM}	Pulsed Drain Current (Note 1)	12	A
V _{GS}	Gate-Source Voltage	± 20	V
E _{AS}	Single Pulsed Avalanche Energy (Note 2)	400	mJ
P _D	Maximum Power Dissipation (T _C =25°C)	166	W
	Derating Factor above 25°C	1.0	W/°C
T _J	Operating Junction Temperature Range	-55 to +150	°C
T _{STG}	Storage Temperature Range	-55 to +150	°C

Thermal Characteristics

Symbol	Parameter	Max.	Units
R _{thj-c}	Thermal Resistance, Junction to case	0.75	°C/ W
R _{thj-a}	Thermal Resistance, Junction to Ambient	62.5	°C/ W

Electrical Characteristics ($T_C=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	1500	-	-	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=1500V, V_{GS}=0V$	-	-	10	μA
I_{GSS}	Gate Leakage Current, Forward	$V_{GS}=30V, V_{DS}=0V$	-	-	100	nA
	Gate Leakage Current, Reverse	$V_{GS}=-30V, V_{DS}=0V$	-	-	-100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	3	-	5	V
$R_{DS(on)}$	Drain-Source On-State Resistance	$V_{GS}=10V, I_D=2A$	-	5	7	Ω
Q_g	Total Gate Charge	$V_{DD}=600V$ $V_{GS}=10V$ $I_D=4A$ (Note 3)	-	32	50	nC
Q_{gs}	Gate-Source Charge		-	11		nC
Q_{gd}	Gate-Drain Charge		-	9		nC
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=750V, V_{GS}=10V$ $I_D=2A, R_G=4.7\Omega$ $T_C=25^\circ\text{C}$ (Note 3)	-	32	-	ns
t_r	Turn-on Rise Time		-	31	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	42	-	ns
t_f	Turn-off Fall Time		-	43	-	ns
C_{iss}	Input Capacitance	$V_{DS}=25V$ $V_{GS}=0V$ $f = 1\text{MHz}$	-	1700	-	pF
C_{oss}	Output Capacitance		-	99	-	pF
C_{rss}	Reverse Transfer Capacitance		-	45	-	pF

Source-Drain Diode Characteristics ($T_C=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
I_S	Continuous Source Diode Forward Current		-	-	4	A
I_{SM}	Pulsed Source Diode Forward Current (Note 1)		-	-	12	A
V_{SD}	Forward On Voltage	$V_{GS}=0V, I_S=4A$	-	0.77	1.5	V
t_{rr}	Reverse Recovery Time	$I_{SD} = 4 A,$ $di/dt = 100 A/\mu s$ $V_{DD} = 45 V,$	-	490		ns
Q_{rr}	Reverse Recovery Charge		-	3		nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. $L=10\text{mH}$, starting $T_j = 25^\circ\text{C}$, $I_D = 1A$, $V_{DD} = 250V$
3. Pulse Width $\leq 300\ \mu s$; Duty Cycles $\leq 2\%$

Test Circuits and Waveform

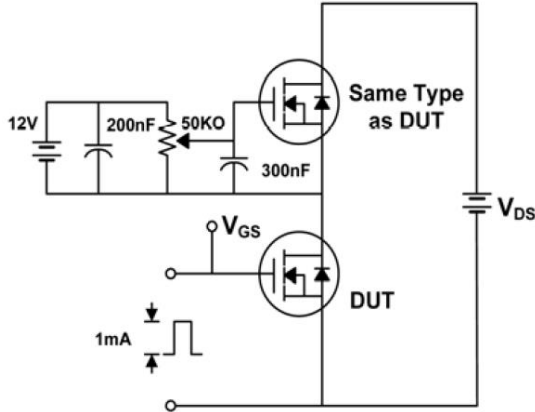


Fig.1 Gate Charge Test Circuit

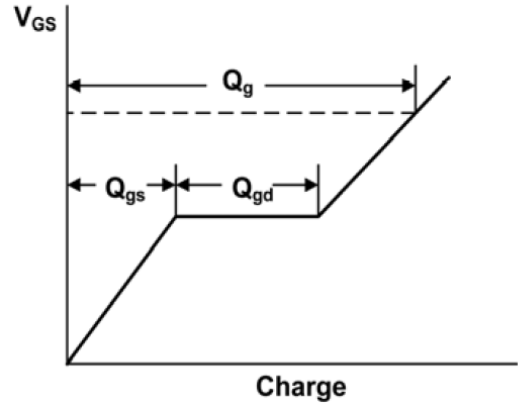


Fig.2 Gate Charge Waveform

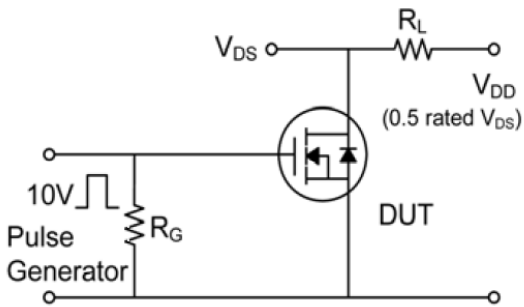


Fig.3 Switching time Test Circuit

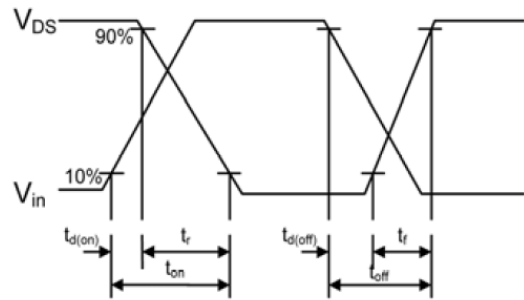


Fig.4 Switching time Waveform

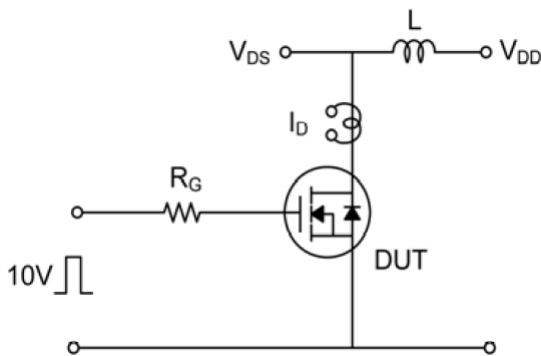


Fig.5 Unclamped Inductive Switching Test Circuit

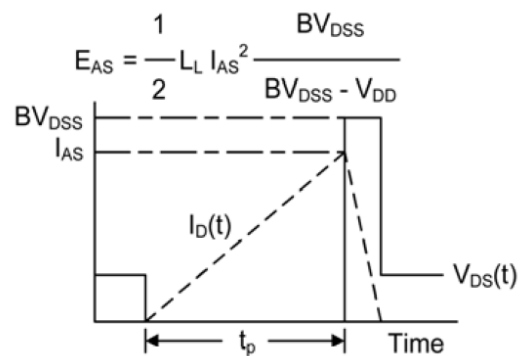


Fig.6 Unclamped Inductive Switching Waveform