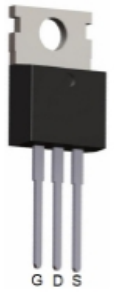
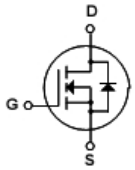
TS01N100

N-Channel Enhancement Mode Power Mosfet

DRAWING





Features

- V_{DS}=100V,I_D=100A,
  $R_{DS(ON)}$<11mΩ @V_{GS}=10V(TYPE:9.9mΩ)
- Special process technology for high ESD capability
- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation

Description

- Package:TO-220C
- The TS01N100 uses advanced trench technology and design to provide excellent RDS(ON) with low gate charge. It can be used in a wide variety of applications.

Absolute Maximum Ratings

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current -Continuous(Tc=25℃)	100	A
I_D(100℃)	Drain Current -Continuous(Tc=100℃)	80	A
I_{DM}	Pulsed Drain Current	380	A
P_D	Maximum Power Dissipation	200	W
	Derating factor	1.33	W/℃
E_{AS}	Single pulse Avalanche Energy(Note5)	800	mJ
T_J T_{STG}	Operating and Storage Temperature Range	-55 to +175	℃

Thermal Characteristics

Symbol	Parameter	Typ	Max	Units
$R_{\theta JC}$	Thermal Resistance,Junction-to-Ambient(Note2)	_	0.75	℃/W

Electrical Characteristics(Tc=25℃ unless otherwise noted)

Off Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=250uA	100	110	_	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=100V,V_{GS}=0V	_	_	1	uA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V,V_{DS}=0V	_	_	±100	nA

On Characteristics(Note 3)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250uA	2	3	4	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=10V,I_D=40A	_	9.9	13	mΩ
g_{FS}	Forward Transconductance	V_{DS}=50V，I_D=40A	100	-	-	S

Dynamic Characteristics(Note 4)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Ciss	Input Capacitance	V_{DS}=50V,V_{GS}=0V,F=1.0MHz	_	4800	_	PF
Coss	Output Capacitance		_	340	_	
Crss	Reverse Transfer Capacitance		_	150	_	

Switching Characteristics(Note 4)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=50V,I_D=40A V_{GS}=10V,R_{GEN}=2.5Ω	_	15	_	ns
t_r	Turn-On Rise Time		_	50	_	ns
t_{doff}	Turn-Off Delay Time		_	40	_	ns
t_f	Turn-Off Fall Time		_	55	_	ns
Q_g	Total Gate Charge	V_{DS}=80V I_D=40A V_{GS}=10V	_	85	_	nc
Q_{gs}	Gate-Source Charge		_	18	_	nc
Q_{gd}	Gate-Drain Charge		_	28	_	nc

Drain-Source Diode Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Is	Diode forward current(Note 2)		_	_	57	A
V_{SD}	Diode Forward Voltage(Note 3)	V_{GS}=0V,I_S=40A	_	_	1.2	V
trr	Reverse Recovery Time	TJ=25℃,IF=40A dif/dt=100A/us(Note 3)	_	38	80	ns
Qrr	Reverse Recovery charge		_	53	100	nc
ton	Forward Turn-on Time	Intrinsic turn-on time is negligible(Turn-on is dominated by LS+LD)				

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2. Surface Mounted on FR4 Board, t ≤ 10 sec.

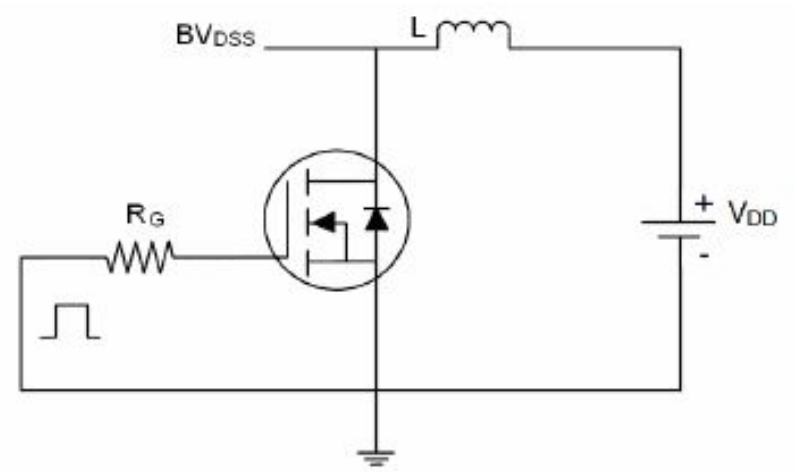
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

4. Guaranteed by design, not subject to production

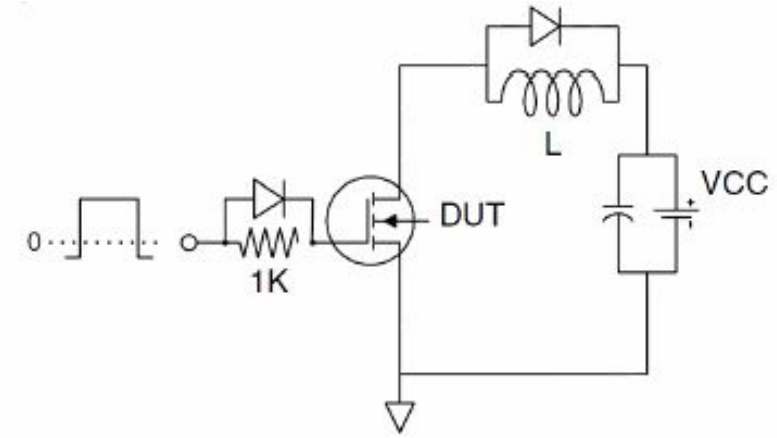
5. EAS condition：Tj=25℃,VDD=50V,VG=10V,L=0.5mH,Rg=25Ω

Test circuits

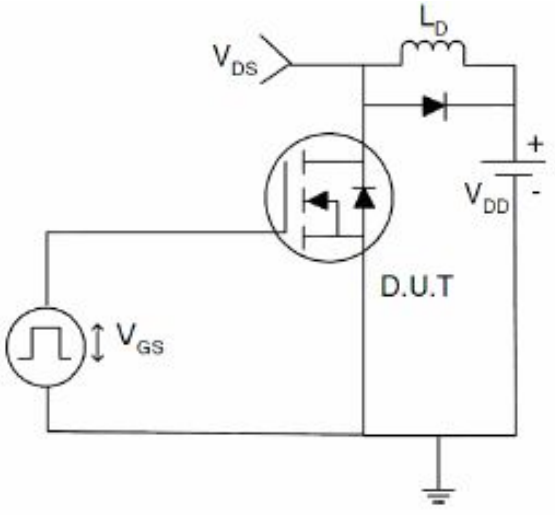
1)EAS Test Circuits



2)Cate Charge Test Circuit



3）Switch Time Test Circuit



Typical Electrical And Thermal Characteristics(Curves)

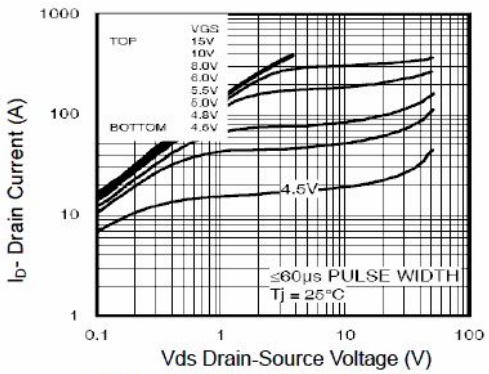


Figure 1 Output Characteristics

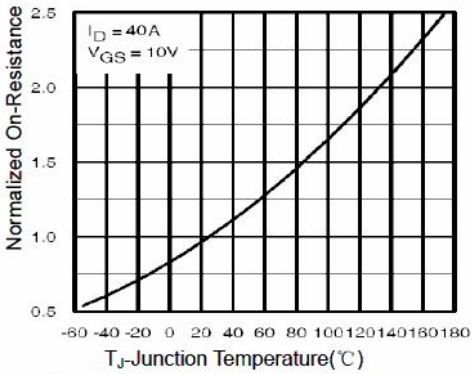


Figure 4 Rdson-JunctionTemperature

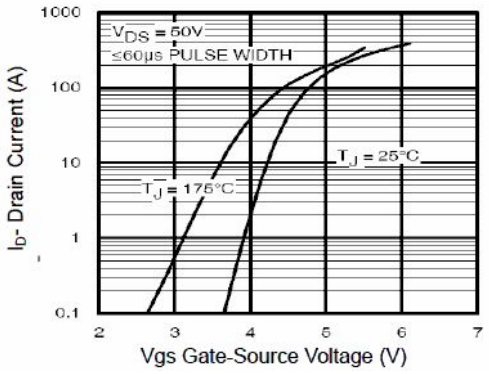


Figure 2 Transfer Characteristics

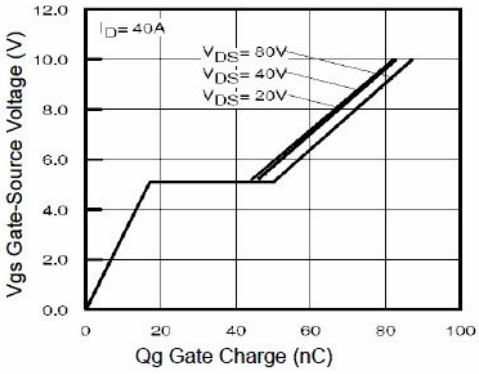


Figure 5 Gate Charge

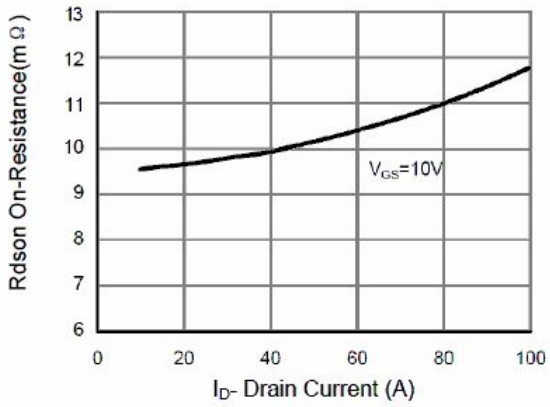


Figure 3 Rdson- Drain Current

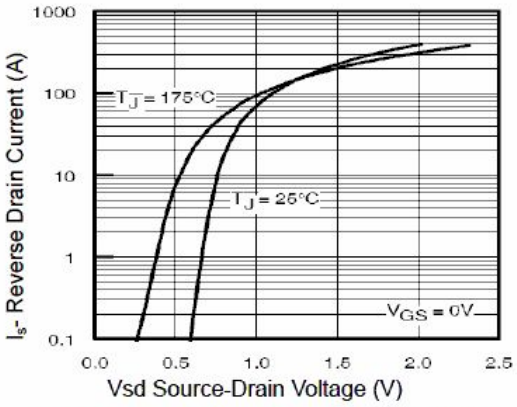


Figure 6 Source- Drain Diode Forward

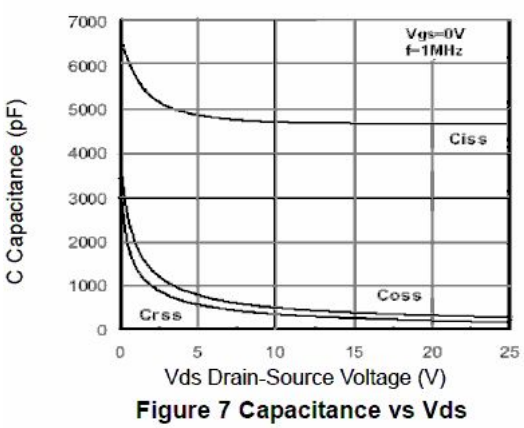


Figure 7 Capacitance vs Vds

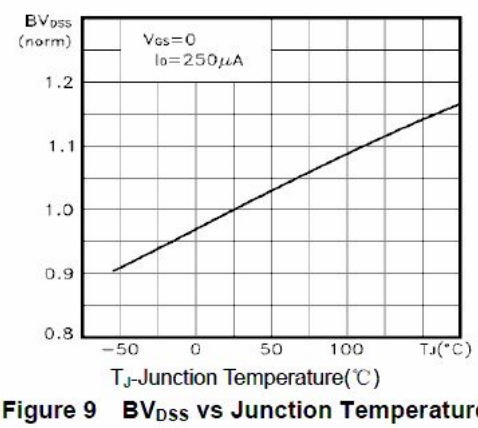


Figure 9 BV_{DSS} vs Junction Temperature

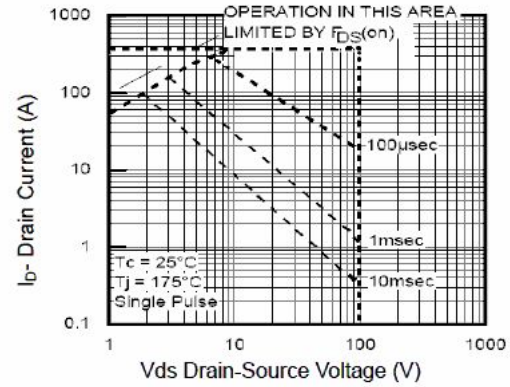


Figure 8 Safe Operation Area

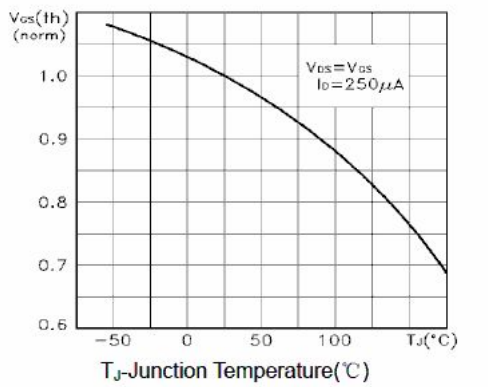


Figure 10 $V_{GS(th)}$ vs Junction Temperature

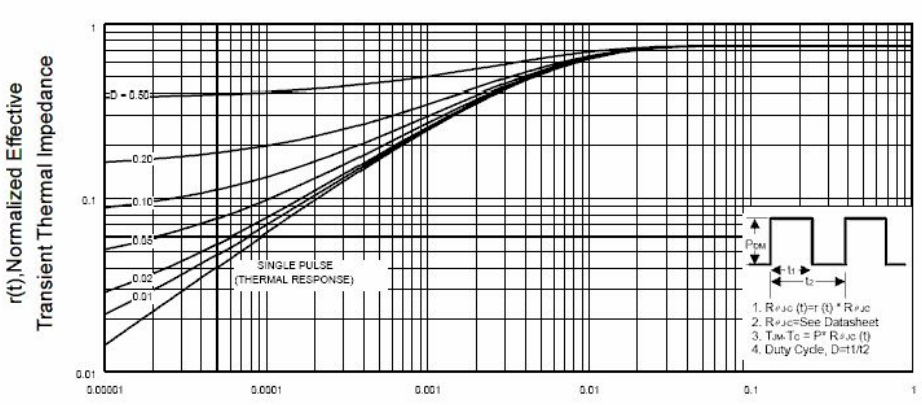


Figure 11 Normalized Maximum Transient Thermal Impedance

Mechanical Dimensions