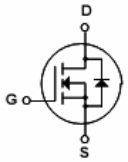
TS12N60

600V N-Channel Mosfet

DRAWING

G D S



Features

- 12A,600V,R_{DSON}=0.7Ω@V_{GS}=10V
- Ultra low gate charge(typical 42nc)
- Low Reverse transfer capacitance (Crsstypical25PF)
- Fast switching capability
- 100%avalanche energy specified
- Improved dv/dt capability，high ruggedness

General Description

- Package:ITO-220AB
- This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and with stand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency switch mode power supply.

Absolute Maximum Ratings

Symbol	Parameter	Spec	Units
V_{DSS}	Drain-Source Voltage	600	V
I_D	Drain Current -Continuous(Tc=25℃)	12	A
I_{DM}	Drain Current -Pulsed	48	A
V_{GSS}	Gate-Source Voltage	±30	V
E_{AS}	Single Pulsed Avalanche Energy	790	mJ
I_{AR}	Avalanche Current	12	A
E_{AR}	Repetitive Avalanche Energy	24	mJ
dv/dt	Peak Diode Recovery dv/dt	4.5	V/ns
Tj	Junction Temperature	+150	℃
Topr	Operating Temperature Range	-55 to +150	℃
T_{stg}	Storage Temperature	-55 to +150	℃

Electrical Characteristics(Tc=25℃ unless otherwise noted)

Off Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=250uA	600	_	_	V
BV_{DSS}/T_J	Breakdown Voltage Temperature Coefficient	ID=250uA,Referenced to 25℃	_	0.7	_	V/℃
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=600V,V_{GS}=0V	_	_	1	uA
		V_{DS}=480V,Tc=125℃	_	_	100	uA
I_{GSSF}	Gate-Body Leakage Current,Forward	Vgs=30V,Vds=0V	_	_	100	nA
I_{GSSR}	Gate-Body Leakage Current,Reverse	Vgs=-30V,Vds=0V	_	_	-100	nA

On Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
V_{GSTH}	Gate Threshold Voltage	VDS=VGS,ID=250uA	2.0	_	4.0	V
R_{DSON}	Static Drain-Source On-Resistance	VGS=10V,ID=6A	_	0.61	0.7	Ω

Dynamic Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Cjss	Input Capacitance	VDS=25V,VGS=0V,f=1.0MHz	_	1480	1900	pF
Coss	Output Capacitance		_	200	270	pF
Crss	Reverse Transfer Capacitance		_	25	35	pF

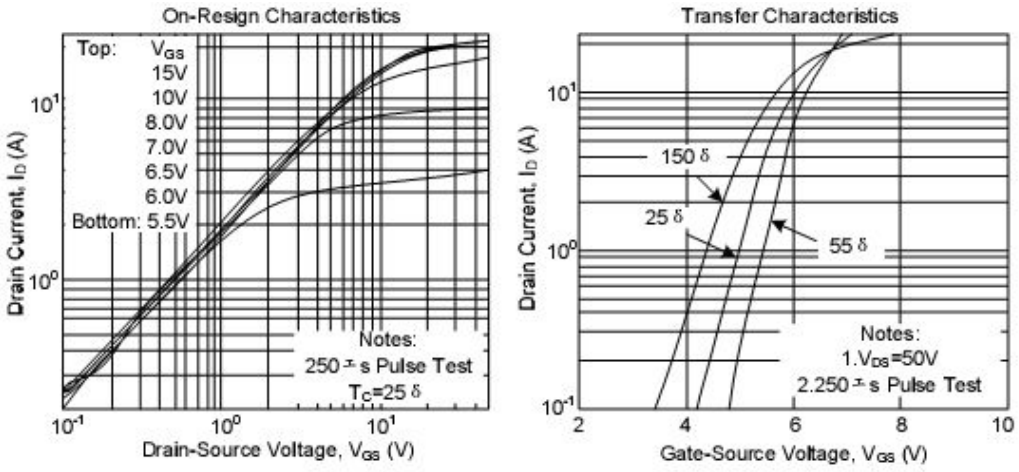
Switching Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
t_{don}	Turn-On Delay Time	V_{DD}=300V I_D=12A R_G=25Ω	_	30	70	ns
t_r	Turn-On Rise Time		_	115	240	ns
t_{doff}	Turn-Off Delay Time		_	95	200	ns
t_f	Turn-Off Fall Time		_	85	180	ns
Q_g	Total Gate Charge	V_{DS}=480V I_D=12A V_{GS}=10V	_	42	54	nc
Q_{gs}	Gate-Source Charge		_	8.6	_	nc
Q_{gd}	Gate-Drain Charge		_	21	_	nc

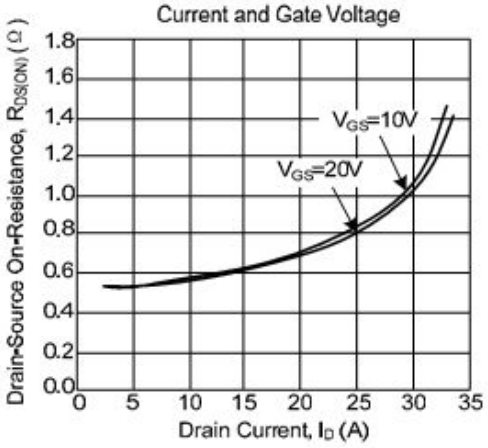
Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Is	Maximum Continuous Drain-source diode forward current		_	_	12	A
Ism	Maximum pulsed drain-source diode diode forward current		_	_	48	A
Vsd	Drain-source diode forward Voltage	VGS=0V,IS=6.2A	_	_	1.4	V
Trr	Reverse Recovery Time	VGS=0V,IS=6.2A dif/dt=100A/us	_	380	_	ns
Qrr	Reverse Recovery charge		_	3.5	_	uc

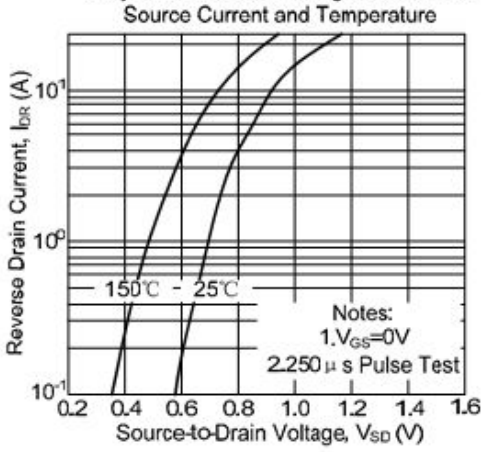
Typical Characteristics



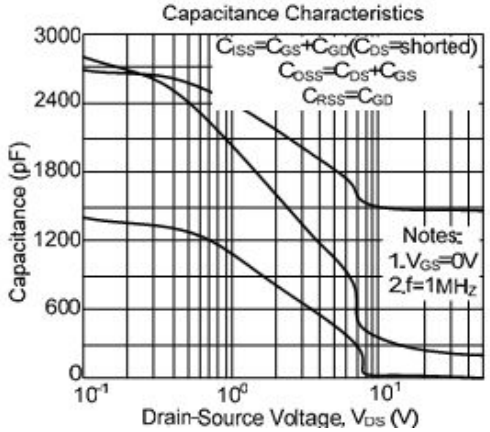
On-Resistance Variation vs.Drain Current and Gate Voltage



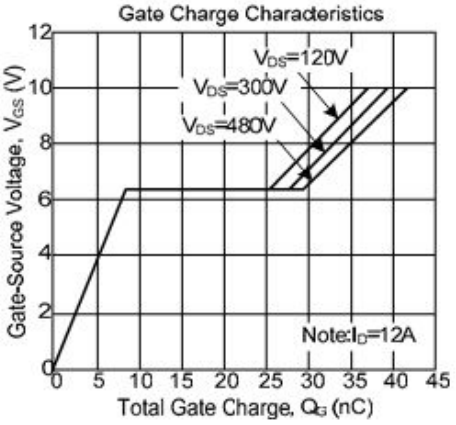
Body Diode Forward Voltage Variation vs. Source Current and Temperature



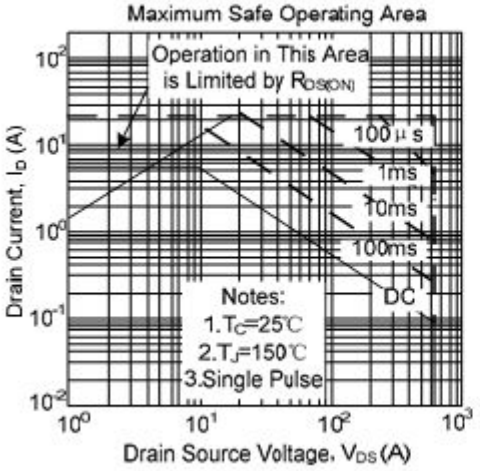
Capacitance Characteristics



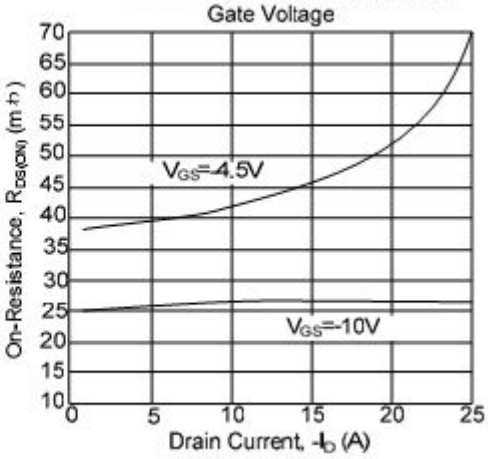
Gate Charge Characteristics



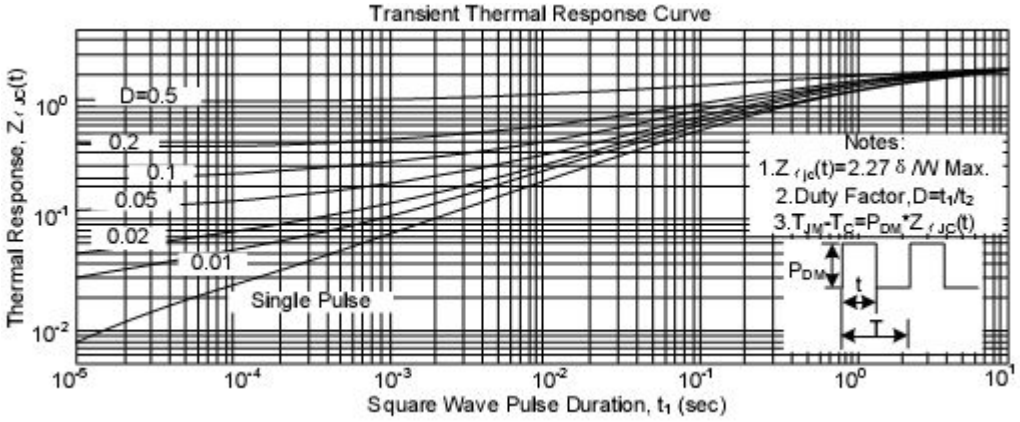
Maximum Safe Operating Area



On-Resistance vs. Drain Current and Gate Voltage



Transient Thermal Response Curve



Test circuits and waveforms

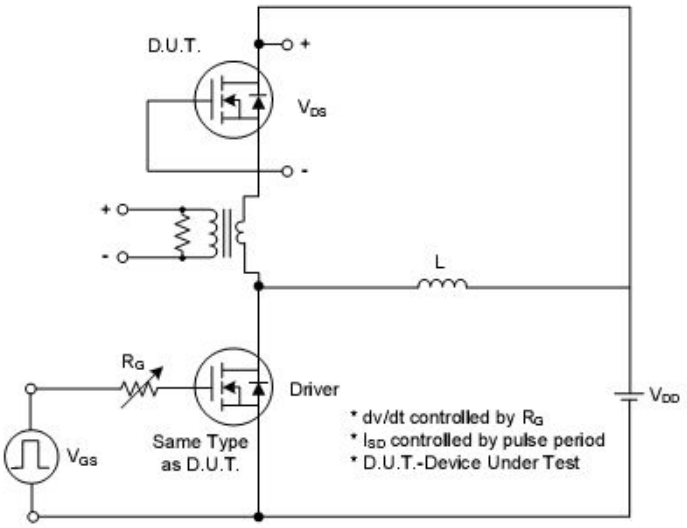
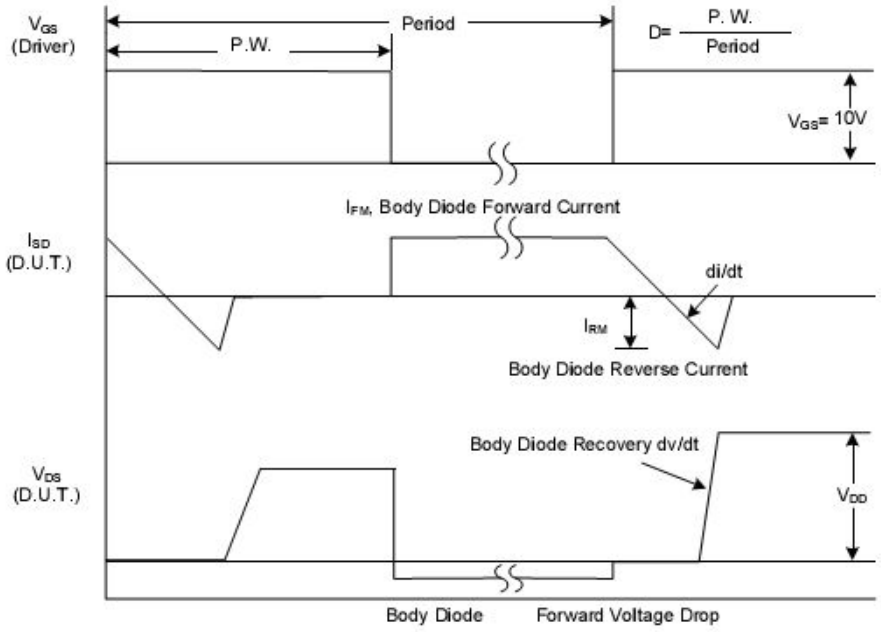


Fig. 1A Peak Diode Recovery dv/dt Test Circuit



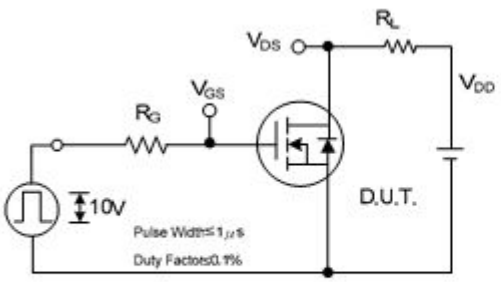


Fig. 2A Switching Test Circuit

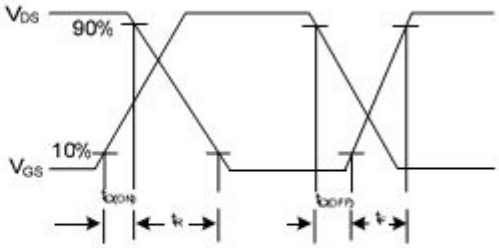


Fig. 2B Switching Waveforms

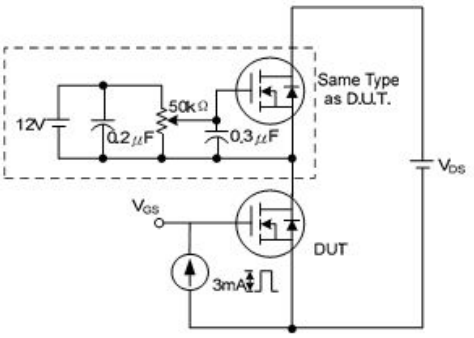


Fig. 3A Gate Charge Test Circuit

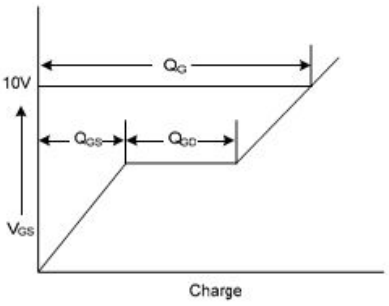


Fig. 3B Gate Charge Waveform

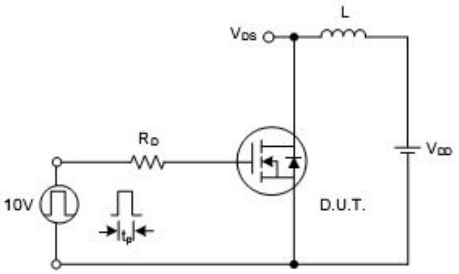


Fig. 4A Unclamped Inductive Switching Test Circuit

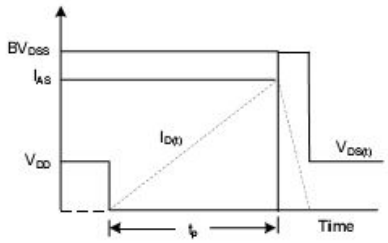


Fig. 4B Unclamped Inductive Switching Waveforms

Mechanical Dimensions