

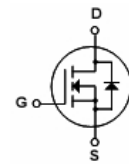
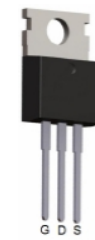
TS12N60

600V N-Channel Mosfet

DRAWING

Features

- ◆ 12A,600V, $R_{DS(on)}=0.7\Omega@V_{GS}=10V$
- ◆ 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:TO-220C
- ◆ 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($T_c=25^\circ C$)	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
T_j	Junction Temperature	+150	$^\circ C$
T_{opr}	Operating Temperature Range	-55 to +150	$^\circ C$
T_{stg}	Storage Temperature	-55 to +150	$^\circ C$

Electrical Characteristics($T_c=25^\circ C$ unless otherwise noted)

Off Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	600	-	-	V
BV_{DSS}/T_j	Breakdown Voltage Temperature Coefficient	$I_D=250\mu A$, Referenced to $25^\circ C$	-	0.7	-	$V/^\circ C$
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=600V, V_{GS}=0V$	-	-	1	μA
		$V_{DS}=480V, T_c=125^\circ C$	-	-	100	μA
I_{GSSF}	Gate-Body Leakage Current, Forward	$V_{GS}=30V, V_{DS}=0V$	-	-	100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	$V_{GS}=-30V, V_{DS}=0V$	-	-	-100	nA

On Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
V _{GSTH}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	2.0	—	4.0	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =6A	—	0.61	0.7	Ω

Dynamic Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
C _{JSS}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	—	1480	1900	pF
C _{OSS}	Output Capacitance		—	200	270	pF
C _{rss}	Reverse Transfer Capacitance		—	25	35	pF

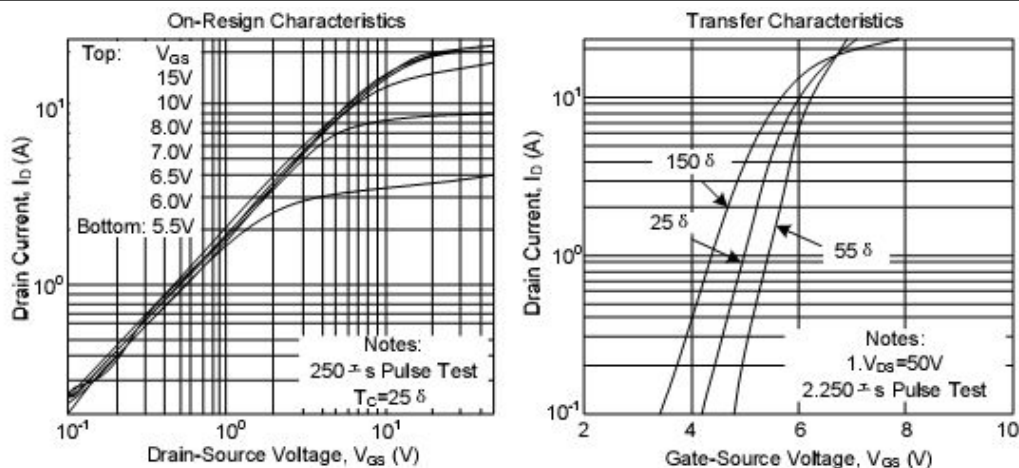
Switching Characteristics

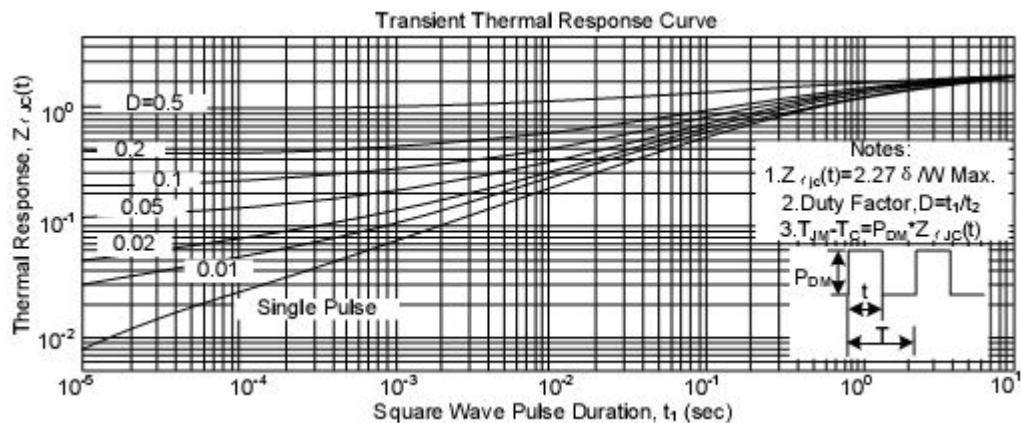
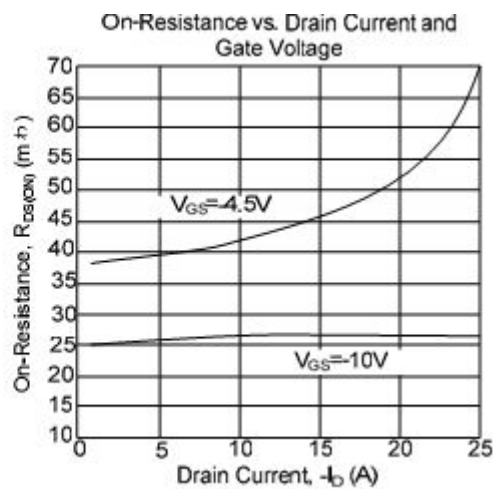
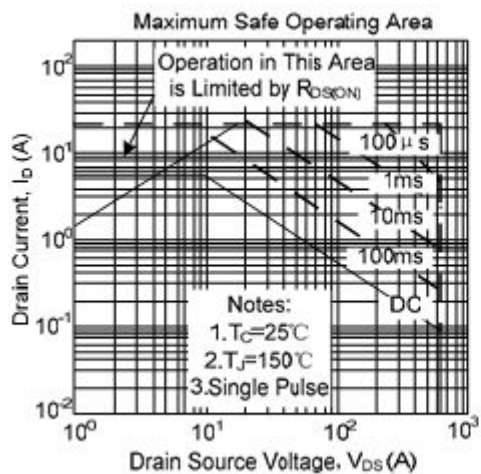
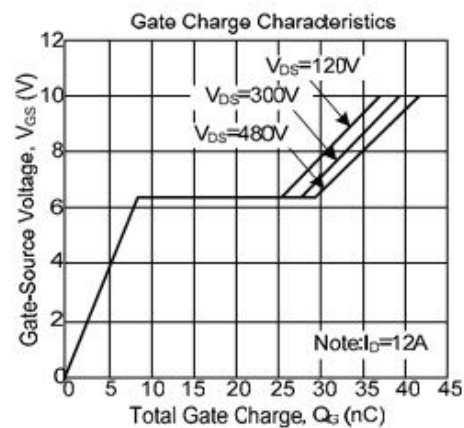
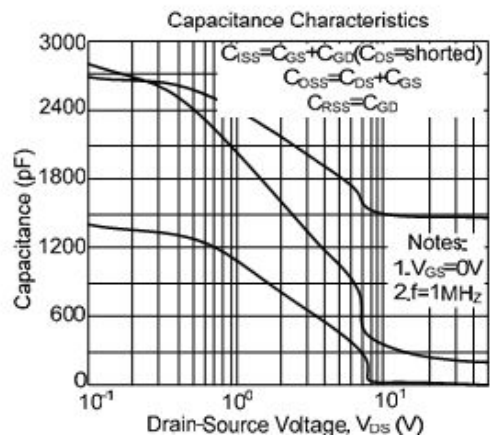
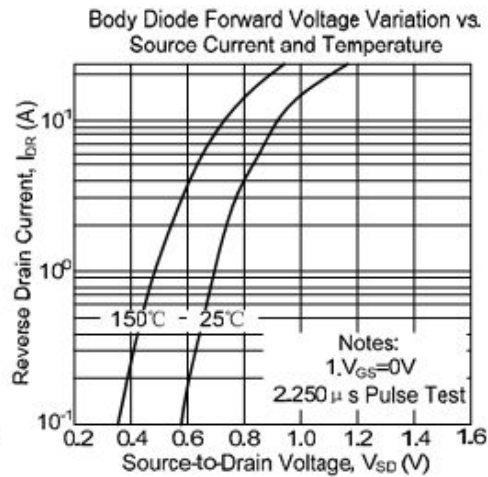
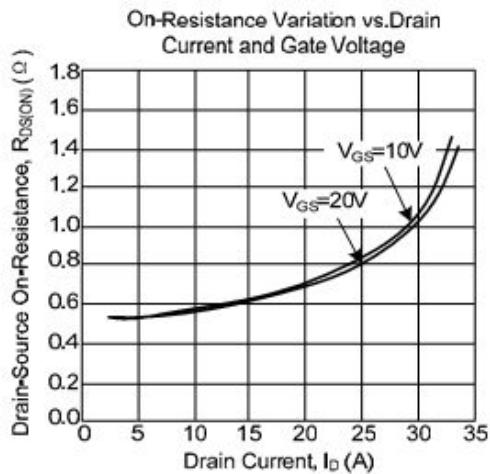
Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
t _{don}	Turn-On Delay Time	V _{DD} =300V I _D =12A R _G =25Ω	—	30	70	ns
t _r	Turn-On Rise Time		—	115	240	ns
t _{doff}	Turn-Off Delay Time		—	95	200	ns
t _f	Turn-Off Fall Time	V _{DS} =480V I _D =12A V _{GS} =10V	—	85	180	ns
Q _g	Total Gate Charge		—	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
I _s	Maximum Continuous Drain-source diode forward current		—	—	12	A
I _{sm}	Maximum pulsed drain-source diode diode forward current		—	—	48	A
V _{sd}	Drain-source diode forward Voltage	V _{GS} =0V, I _S =6.2A	—	—	1.4	V
T _{rr}	Reverse Recovery Time	V _{GS} =0V, I _S =6.2A	—	380	—	ns
Q _{rr}	Reverse Recovery charge	dif/dt=100A/us	—	3.5	—	uc

Typical Characteristics





Test circuits and waveforms

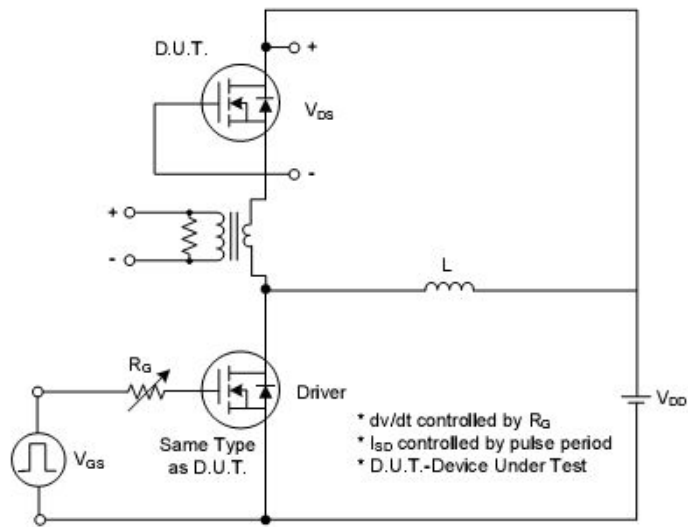


Fig. 1A Peak Diode Recovery dv/dt Test Circuit

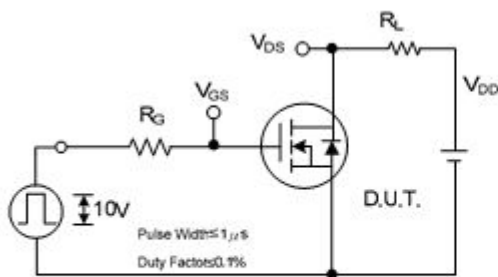
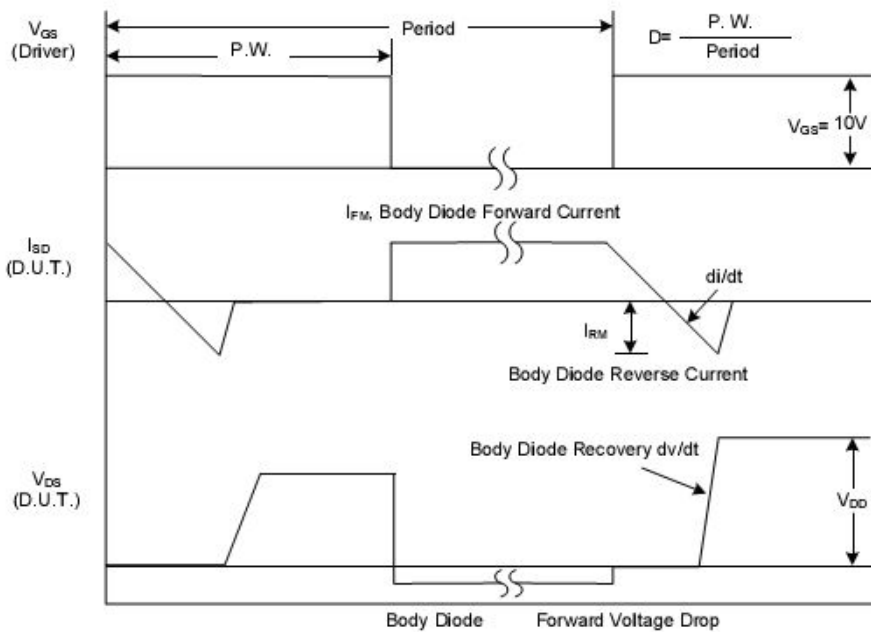


Fig. 2A Switching Test Circuit

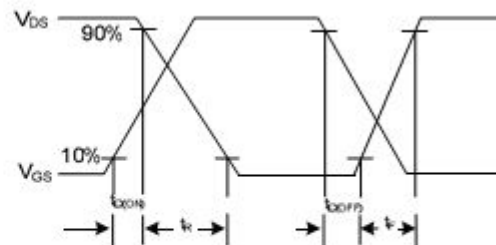


Fig. 2B Switching Waveforms

