

General Description

The 5N60 have been fabricated using an advanced high voltage MOSFET process that is designed to deliver high levels of performance and robustness in popular AC-DC applications.

Features

- 4.5A, 600V, $R_{DS(on)} = 2.5 \Omega$
@ $V_{GS} = 10 V$
- 100% Avalanche Tested
- Improved dv/dt capability

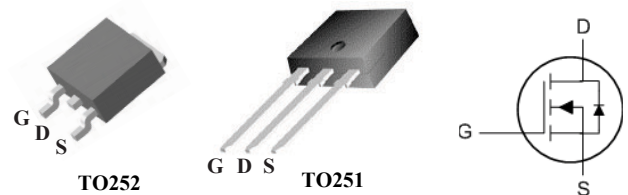
Product Summary

BVDSS	RDSON	ID
600V	2.5 Ω	4.5A

Applications

- Power Supply
- PFC
- Ballast

TO252 / TO251 Pin Configuration



Absolute Maximum Ratings

$T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Value	Units
V_{DSS}	Drain-Source Voltage	600	V
I_D	Drain Current - Continuous ($T_C = 25^\circ\text{C}$)	4.5	A
	- Continuous ($T_C = 100^\circ\text{C}$)	2.6	A
I_{DM}	Drain Current - Pulsed ^a	13.5	A
V_{GSS}	Gate-Source Voltage	± 30	V
E_{AS}	Single Pulsed Avalanche Energy ^b	220	mJ
I_{AR}	Avalanche Current ^a	4.5	A
E_{AR}	Repetitive Avalanche Energy ^a	4.9	mJ
dv/dt	Peak Diode Recovery dv/dt ^c	4.5	V/ns
P_D	Power Dissipation ($T_C = 25^\circ\text{C}$)	54	W
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ\text{C}$
T_L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	300	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case Max.	2.56	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient Max.	110	$^\circ\text{C/W}$

Electrical Characteristic

 $T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
--------	-----------	-----------------	-----	-----	-----	-------

Off Characteristics

BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\text{ A}$	600	--	--	V
BV_{DSS} / T_J	Breakdown Voltage Temperature Coefficient	$I_D = 250\text{ A}$, Referenced to 25°C	--	0.6	--	V/ $^\circ\text{C}$
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 600\text{ V}, V_{GS} = 0\text{ V}$	--	--	1	A
		$V_{DS} = 480\text{ V}, T_C = 125^\circ\text{C}$	--	--	10	
I_{GSSF}	Gate-Body Leakage Current, Forward	$V_{GS} = 30\text{ V}, V_{DS} = 0\text{ V}$	--	--	100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	$V_{GS} = -30\text{ V}, V_{DS} = 0\text{ V}$	--	--	-100	nA

On Characteristics

$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\text{ A}$	2.0	--	4.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS} = 10\text{ V}, I_D = 2.25\text{ A}$	--	--	2.5	Ω
g_{FS}	Forward Transconductance	$V_{DS} = 40\text{ V}, I_D = 2.25\text{ A}^d$	--	4.7	--	S

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{DS} = 25\text{ V}$ $V_{GS} = 0\text{ V}$ $f = 1.0\text{ MHz}$	--	490	--	pF
C_{oss}	Output Capacitance		--	55	--	pF
C_{rss}	Reverse Transfer Capacitance		--	10	--	pF

Switching Characteristics

$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 300\text{ V}$ $I_D = 4.5\text{ A}$ $R_G = 25\Omega$ d,e	--	15	--	ns
t_r	Turn-On Rise Time		--	42	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	55	--	ns
t_f	Turn-Off Fall Time		--	26	--	ns
Q_g	Total Gate Charge	$V_{DS} = 480\text{ V}$ $I_D = 4.5\text{ A}$ $V_{GS} = 10\text{ V}$ d,e	--	15	--	nC
Q_{gs}	Gate-Source Charge		--	2.8	--	nC
Q_{gd}	Gate-Drain Charge		--	7	--	nC

Drain-Source Diode Characteristics and Maximum Ratings

I _S	Maximum Continuous Drain-Source Diode Forward Current		--	--	4.5	A
I _{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	13.5	A
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} = 0 V, I _S = 4.5A	--	--	1.4	V
t _{rr}	Reverse Recovery Time	V _{GS} = 0 V, I _S = 4.5A dI /dt = 100 A/ s d	--	300	--	ns
Q _{rr}	Reverse Recovery Charge		--	2.2	--	C

Notes:

- Repetitive Rating: Pulse width limited by maximum junction temperature
- $L = 18.9\text{ mH}$, $I_{AS} = 4.5\text{ A}$, $V_{DD} = 50\text{ V}$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$
- $I_{SD} \leq 4.5\text{ A}$, $di/dt \leq 200\text{ A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$
- Pulse Test: Pulse width $\leq 300\text{ }\mu\text{s}$, Duty cycle $\leq 2\%$
- Essentially independent of operating temperature