CMD5N60/CMU5N60

600V N-Channel MOSFET

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.

Product Summery

BVDSS	RDSON	ID
600V	2.5Ω	4.5A

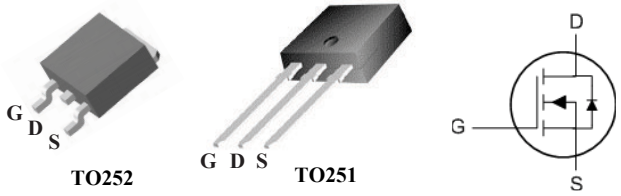
Features

- 4.5A, 600V, RDS (on) = 2.5 Ω @VGS = 10 V
- 100% Avalanche Tested
- Improved dv/dt capability

Applications

- Power Supply
- PFC
- Ballast

TO252 / TO251 Pin Configuration



Absolute Maximum Ratings

T_C = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V_{DSS}	Drain-Source Voltage	600	V
I_D	Drain Current - Continuous (T_C = 25°C)	4.5	A
	- Continuous (T_C = 100°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°C)	54	W
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	°C
T_L	Maximum lead temperature for soldering purposes, 1/8 from case for 5 seconds	300	°C

Thermal Characteristics

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

Electrical Characteristic

T_C = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = 250 A	600	--	--	V
BV_{DSS} / T_J	Breakdown Voltage Temperature Coefficient	I_D = 250 A, Referenced to 25°C	--	0.6	--	V/°C
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 600 V, V_{GS} = 0 V	--	--	1	A
		V_{DS} = 480 V, T_C = 125°C	--	--	10	
I_{GSSF}	Gate-Body Leakage Current, Forward	V_{GS} = 30 V, V_{DS} = 0 V	--	--	100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	V_{GS} = -30 V, V_{DS} = 0 V	--	--	-100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250 A	2.0	--	4.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	V_{GS} = 10 V, I_D = 2.25A	--	--	2.5	Ω
g_{FS}	Forward Transconductance	V_{DS} = 40 V, I_D = 2.25A [d]	--	4.7	--	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = 25 V	--	490	--	pF
C_{oss}	Output Capacitance	V_{GS} = 0 V	--	55	--	pF
C_{rss}	Reverse Transfer Capacitance	f = 1.0 MHz	--	10	--	pF
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 300 V	--	15	--	ns
t_r	Turn-On Rise Time	I_D = 4.5A [d,e]	--	42	--	ns
$t_{d(off)}$	Turn-Off Delay Time	R_G = 25Ω	--	55	--	ns
t_f	Turn-Off Fall Time		--	26	--	ns
Q_g	Total Gate Charge	V_{DS} = 480 V	--	15	--	nC
Q_{gs}	Gate-Source Charge	I_D = 4.5A [d,e]	--	2.8	--	nC
Q_{gd}	Gate-Drain Charge	V_{GS} = 10 V	--	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	--	300	--	ns
Q_{rr}	Reverse Recovery Charge	dI /dt = 100 A/ s [d]	--	2.2	--	C

Notes:

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

b. L = 18.9mH, IAS = 4.5 A, VDD = 50V, RG = 25 Ω, Starting TJ = 25℃

c. I_{SD} ≤ 4.5A, di/dt ≤ 200A/μs, VDD ≤ BVDSS, Starting T_J= 25°C

d. Pulse Test：Pulse width ≤ 300 μs, Duty cycle ≤ 2%

e. Essentially independent of operating temperature