

General Description

The 5N40A 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

- Fast switching
- 100% avalanche tested
- Improved dv/dt capability
- RoHS Compliant

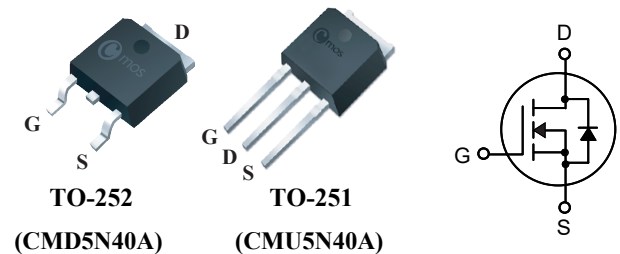
Product Summary

BVDSS	RDSON	ID
400V	1.6Ω	4.2A

Applications

- Power Supply
- PFC

TO-252/251 Pin Configuration



Absolute Maximum Ratings (T_C=25°C unless otherwise noted)

Symbol	Parameter	Rating	Units
V _{DSS}	Drain-Source Voltage	400	V
I _D	Drain Current - Continuous (T _C = 25°C) - Continuous (T _C = 100°C)	4.2	A
		2.8	A
I _{DM}	Drain Current - Pulsed (Note 1)	10	A
V _{GSS}	Gate-Source Voltage	±30	V
E _{AS}	Single Pulsed Avalanche Energy (Note 2)	40	mJ
P _D	Power Dissipation (T _C = 25°C)	75	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	Rating	Units
R _{θJC}	Thermal Resistance, Junction-to-Case Max. (Note 3,4)	1.6	°C/W
R _{θJA}	Thermal Resistance, Junction-to-Ambient Max. (Note 5,6)	55	°C/W

Electrical Characteristic (T_c=25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
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Off Characteristics

BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _D = 250 μA	400	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 400 V, V _{GS} = 0 V	--	--	1	μA
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 μA	3	--	5	V
R _{DS(on)}	Static Drain-Source On-Resistance	V _{GS} = 10 V, I _D = 2.5A	--	--	1.6	Ω
g _{FS}	Forward Transconductance	V _{DS} = 20 V, I _D = 2.5 A	--	3	--	S

Dynamic Characteristics

C _{iss}	Input Capacitance	V _{DS} = 25 V, V _{GS} = 0 V, f = 1.0 MHz	--	330	--	pF
C _{oss}	Output Capacitance		--	42	--	pF
C _{rss}	Reverse Transfer Capacitance		--	3	--	pF

Switching Characteristics

t _{d(on)}	Turn-On Delay Time	V _{DS} = 200 V, I _D = 4.2 A, R _G = 25 Ω, V _{GS} =10V	--	17	--	ns
t _r	Turn-On Rise Time		--	15	--	ns
t _{d(off)}	Turn-Off Delay Time		--	25	--	ns
t _f	Turn-Off Fall Time		--	12	--	ns
Q _g	Total Gate Charge	V _{DS} = 320 V, I _D = 4.2 A, V _{GS} = 10 V	--	7	--	nC
Q _{gs}	Gate-Source Charge		--	2	--	nC
Q _{gd}	Gate-Drain Charge		--	2.5	--	nC

Drain-Source Diode Characteristics and Maximum Ratings

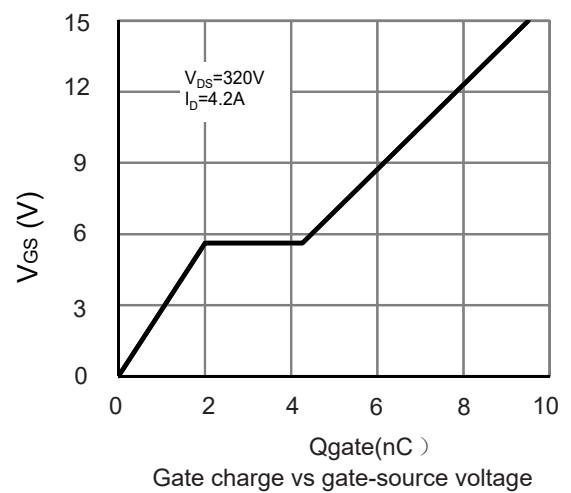
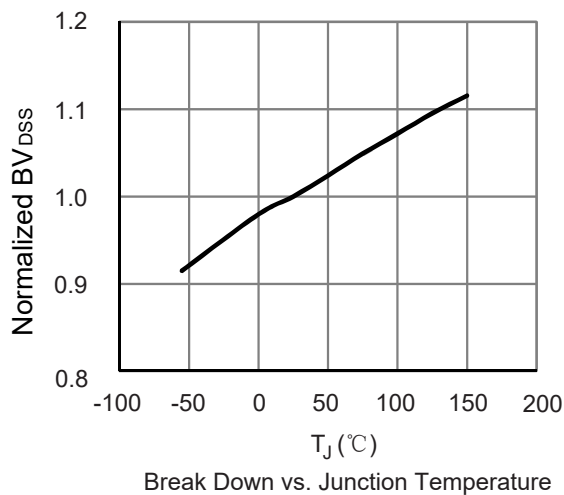
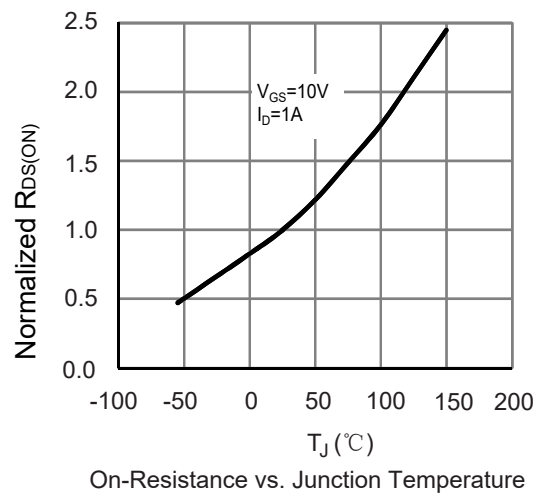
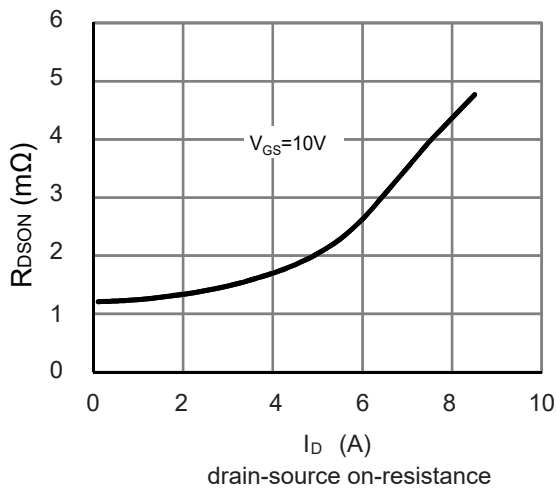
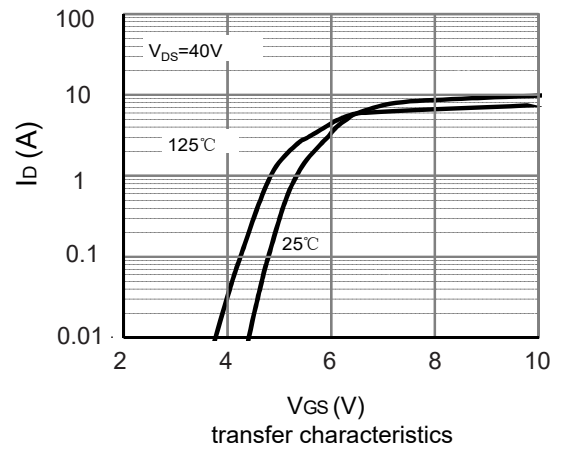
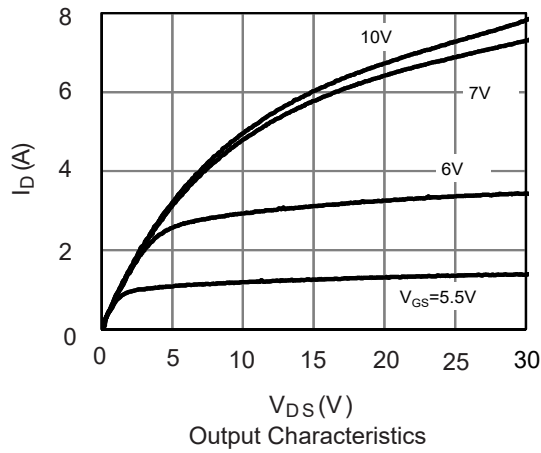
I _S	Maximum Continuous Drain-Source Diode Forward Current	--	--	4.2	A
I _{SM}	Maximum Pulsed Drain-Source Diode Forward Current	--	--	10	A
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} = 0 V, I _S = 1 A	--	--	1.2 V
t _{rr}	Reverse Recovery Time	V _{DS} = 100 V, I _F = 4.2 A, dI _F / dt = 100 A/μs	--	160	ns
Q _{rr}	Reverse Recovery Charge		--	0.93	μC

Notes:

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. L=5mH , I_{AS}=4A , V_{DD}=50V , Starting T_J=25 °C
3. The R_{θJA} is the sum of the thermal impedance from junction to case R_{θJC} and case to ambient.
4. These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of T_{J(MAX)}=150 °C.
5. The value of R_{θJA} is measured with the device in a still air environment with T_A=25 °C.
6. These tests are performed with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C.

This product has been designed and qualified for the consumer market.
Cmos assumes no liability for customers' product design or applications.
Cmos reserves the right to improve product design, functions and reliability without notice.

Typical Characteristics



Typical Characteristics

