CMD5N60/CMU5N60

600V 2.2Ω typ., 4.5A N-Channel MOSFET

General Description

This Power MOSFET is produced using Cmos's advanced planar stripe DMOS technology. These devices are well suited for high efficiency switched mode power supplies,active power factor correction, electronic lamp ballasts based on half bridge topology.

Product Summary

BVDSS	$R_{DS(on)}$ max.	ID
600V	2.5Ω	4.5A

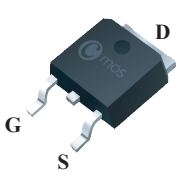
Applications

- Power Supply
- PFC
- Ballast

Features

- 100% Avalanche Tested
- Improved dv/dt capability
- RoHS Compliant

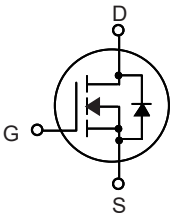
TO-252/251 Pin Configuration



TO-252
(CMD5N60)



TO-251
(CMU5N60)



Absolute Maximum Ratings

T_C = 25℃ unless otherwise noted

Symbol	Parameter	Value	Units
V_{DSS}	Drain-Source Voltage	600	V
I_D	Drain Current - Continuous (T_C = 25℃)	4.5	A
	- Continuous (T_C = 100℃)	2.6	A
I_{DM}	Drain Current - Pulsed [a]	18	A
V_{GSS}	Gate-Source Voltage	± 30	V
E_{AS}	Single Pulsed Avalanche Energy [b]	270	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℃)	54	W
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	℃
T_L	Maximum lead temperature for soldering purposes, 1/8 from case for 5 seconds	300	℃

Thermal Characteristics

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case Max.	2.31	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient Max.	110	℃/W

Electrical Characteristic

T_C = 25℃ 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 μA	600	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 600 V, V_{GS} = 0 V	--	--	1	μA
		V_{DS} = 480 V, T_C = 125℃	--	--	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 μA	3.0	--	5.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	V_{GS} = 10 V, I_D = 2.25A	--	2.2	2.5	Ω
g_{FS}	Forward Transconductance	V_{DS} = 30 V, I_D = 2.5A [d]	--	4.7	--	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = 25 V V_{GS} = 0 V f = 1.0 MHz	--	680	--	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 V I_D = 4.5A [d,e] R_G = 25Ω	--	10	--	ns
t_r	Turn-On Rise Time		--	42	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	40	--	ns
t_f	Turn-Off Fall Time		--	50	--	ns
Q_g	Total Gate Charge	V_{DS} = 480 V I_D = 4.5A [d,e] V_{GS} = 10 V	--	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		--	--	18	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/μs [d]	--	300	--	ns
Q_{rr}	Reverse Recovery Charge		--	2.2	--	μC

Notes:

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

b. The EAS data shows Max. rating . The test condition is V_{DD}=100V , V_{GS}=10V , L=15mH , I_{AS}=6A.

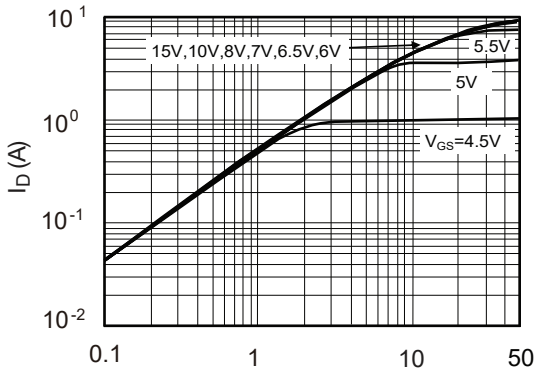
c. I_{SD} ≤ 4.5A, di/dt ≤ 200A/μs, VDD ≤ BVDSS, Starting T_J= 25℃

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

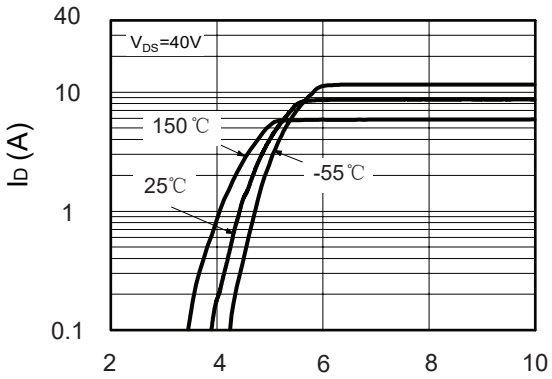
e. Essentially independent of operating temperature

This product has been designed and qualified for the counsumer market.
Cmos assumes no liability for customers' product design or applications.
Cmos reserver the right to improve product design ,functions and reliability wihtout notice.

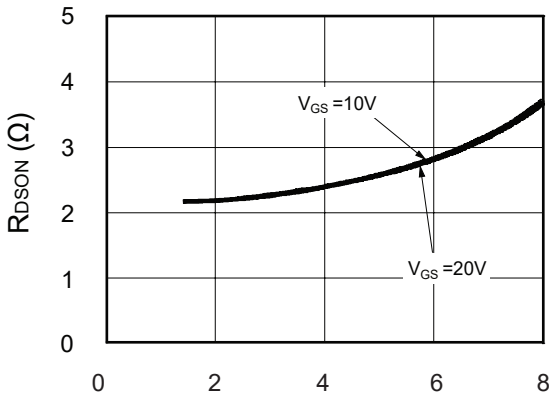
Typical Characteristics



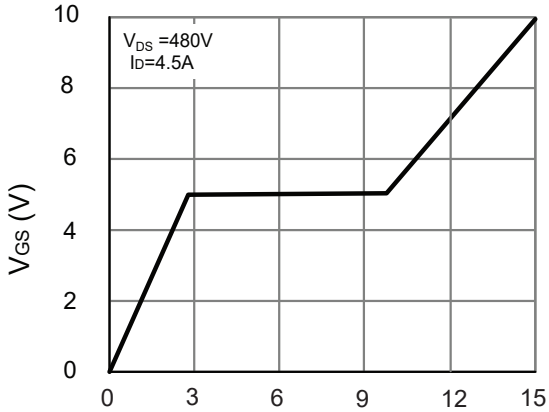
Output Characteristics



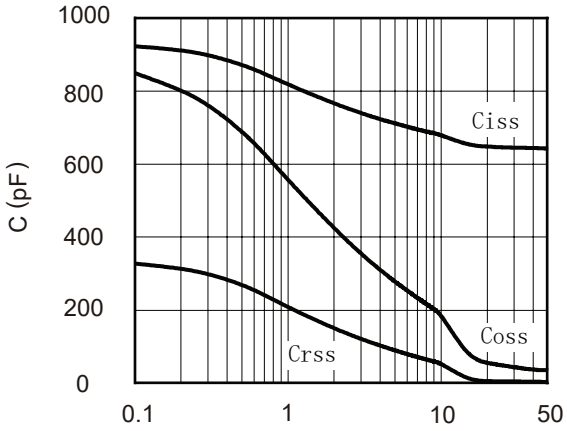
transfer characteristics



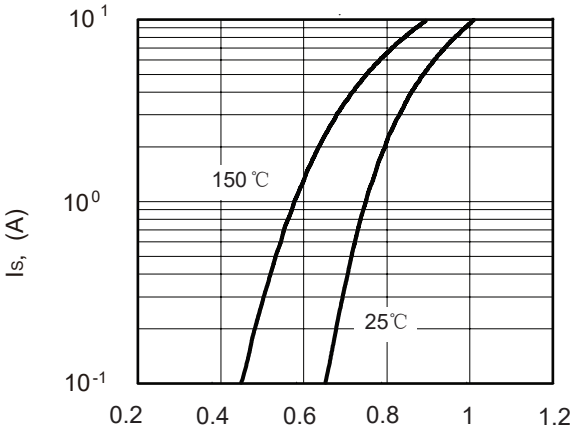
drain-source on-resistance



Gate charge vs gate-source voltage



Capacitance Characteristics



Body-Diode Characteristics