

CMD05N03D/CMU05N03D

30V, 4.2mΩ typ., 80A N-Channel MOSFET

General Description

The 05N03D uses advanced trench technology to provide excellent $R_{DS(on)}$, low gate charge. It is ESD protected. These devices are particularly suited for low voltage application such as cellular phone and notebook computer power management and other battery powered circuits where high-side switching.

Features

- ESD Protected
- Low On-Resistance
- RoHS Compliant

Product Summary

BVDSS	$R_{DS(on)}$ max.	ID
30V	4.9mΩ	80A

Applications

- DC/DC Converter
- Load Switch
- Power Management in Note book

TO-252/251 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±16	V
$I_D@T_C=25^{\circ}C$	Continuous Drain Current	80	A
$I_D@T_C=100^{\circ}C$	Continuous Drain Current	56	A
I_{DM}	Pulsed Drain Current	320	A
EAS	Single Pulse Avalanche Energy ¹	612	mJ
$P_D@T_C=25^{\circ}C$	Total Power Dissipation	65	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient(Steady-State) ^{2,3}	---	55	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-case	---	1.92	°C/W

Electrical Characteristics(T_J=25°C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =25A	---	4.2	4.9	mΩ
		V _{GS} =4.5V, I _D =20A	---	4.7	5.6	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250μA	1.0	---	2.5	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =30V, V _{GS} =0V	---	---	1	μA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±16V, V _{DS} =0V	---	---	±10	μA
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =20A	---	43	---	S
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	1.9	---	Ω
Q _g	Total Gate Charge	I _D =20A	---	71	---	nC
Q _{gs}	Gate-Source Charge	V _{DS} =15V	---	10	---	
Q _{gd}	Gate-Drain Charge	V _{GS} =10V	---	16	---	
T _{d(on)}	Turn-On Delay Time	V _{DS} =15V V _{GS} =10V R _L =0.75Ω, R _{GEN} =3Ω	---	10	---	ns
T _r	Rise Time		---	7	---	
T _{d(off)}	Turn-Off Delay Time		---	76	---	
T _f	Fall Time		---	18	---	
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	---	4000	---	pF
C _{oss}	Output Capacitance		---	550	---	
C _{rss}	Reverse Transfer Capacitance		---	340	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V, Force Current	---	---	80	A
I _{SM}	Pulsed Source Current		---	---	320	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =20A, T _J =25°C	---	0.83	1.2	V

Note:

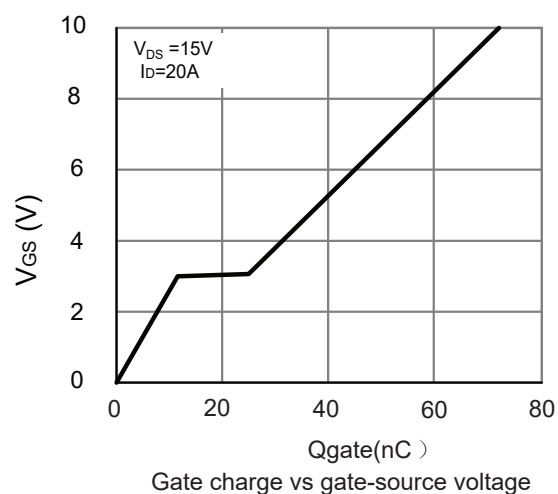
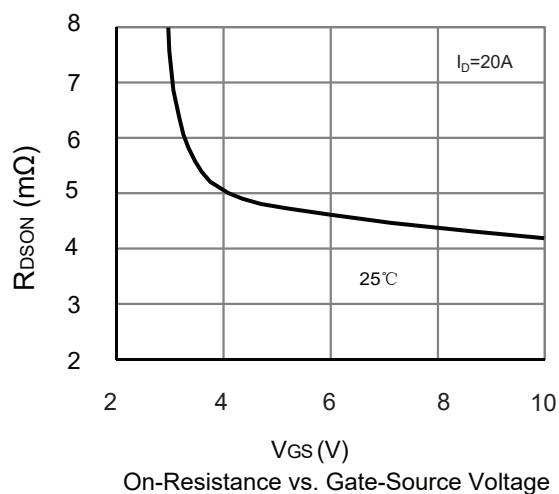
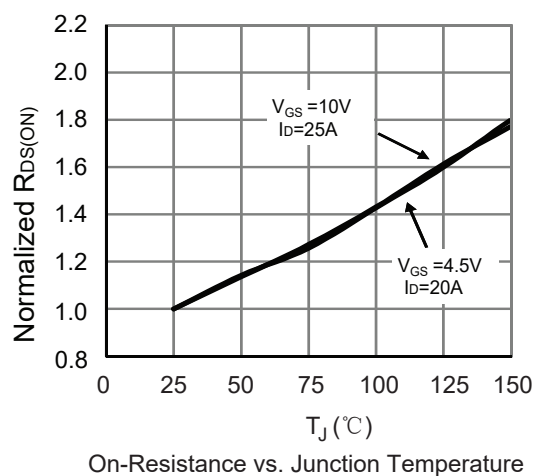
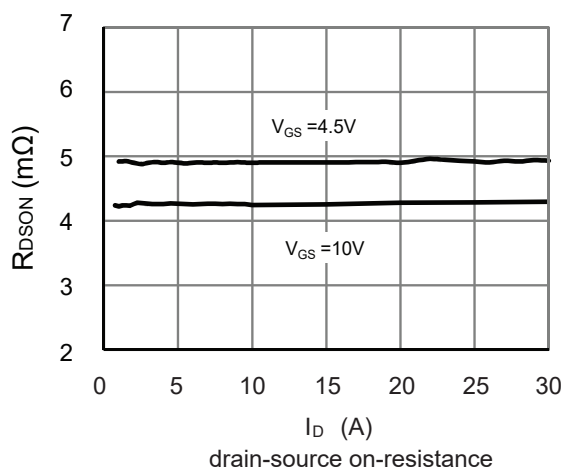
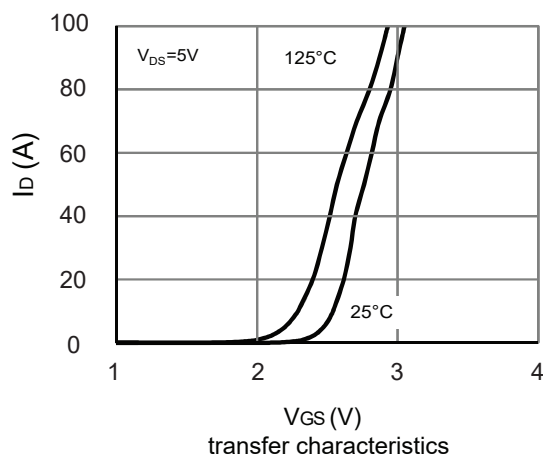
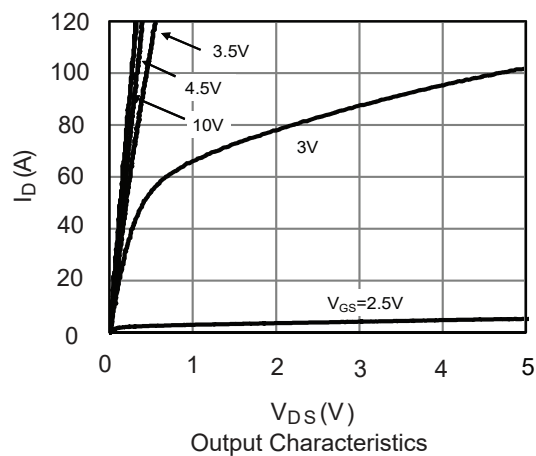
- The EAS data shows Max. rating. The test condition is V_{DD}=30V, V_{GS}=10V, L=1mH, I_{AS}=35A.
- The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The Power dissipation P_{DSM} is based on R_{θJA} and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design, and the maximum temperature of 150°C may be used if the PCB allows it.
- The R_{θJA} is the sum of the thermal impedance from junction to case R_{θJC} and case to ambient.

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.

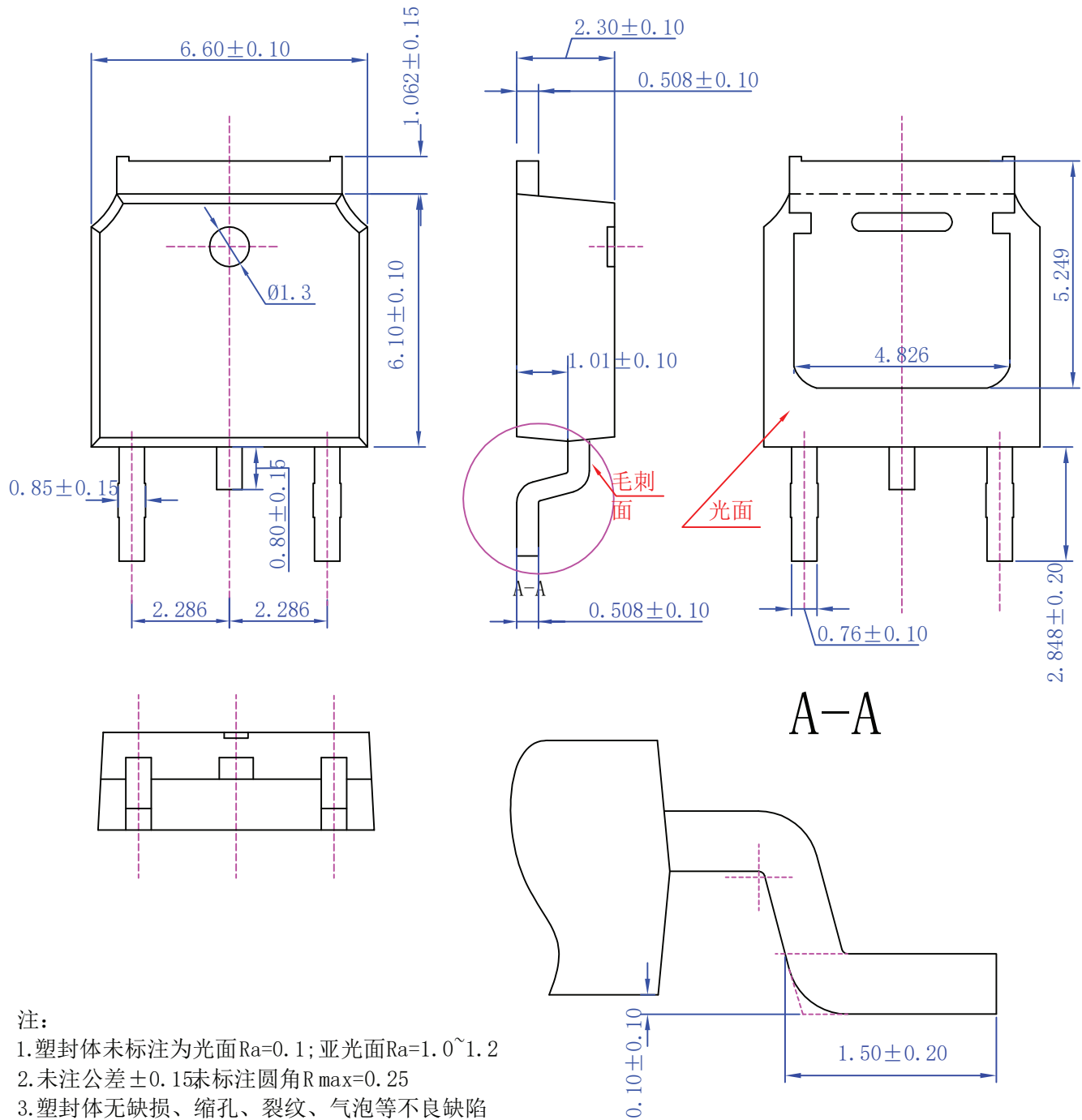
Typical Characteristics



Package Dimension

TO-252

Unit :mm



Package Dimension

TO-251A

Unit :mm

