

General Description

The CMD510B uses advanced trench technology MOSFETs to provide excellent RDS(ON) and low gate charge.

The complementary MOSFETs may be used in H-bridge, Inverters and other applications.

Features

- 100V 14A RDS(ON)≤110mΩ @ VGS=10V
RDS(ON)≤130mΩ @ VGS=4.5V
- -100V -10A RDS(ON)≤200mΩ @ VGS=-10V
- High Density Cell Design For Ultra Low On Resistance

Absolute Maximum Ratings

Symbol	Parameter	Max n-channel	Max p-channel	Units
V _{DS}	Drain-Source Voltage	100	-100	V
V _{GS}	Gate-Source Voltage	±20	±20	V
I _D @T _C =25°C	Continuous Drain Current	14	-10	A
I _{DM}	Pulsed Drain Current	42	-30	A
EAS	Single Pulse Avalanche Energy	30	42	mJ
P _D @T _C =25°C	Power Dissipation	35	32	W
T _{STG}	Storage Temperature Range	-55 to 150	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	-55 to 150	°C

Thermal Characteristics: n-channel

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Maximum Junction-to-Ambient (Steady-State)	---	60	°C/W
R _{θJc}	Maximum Junction-to-Case (Steady-State)	---	3.5	°C/W

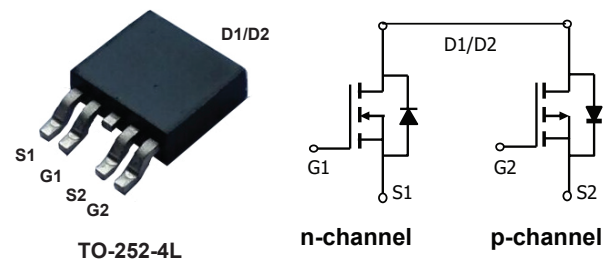
Product Summary

	BVDSS	RDS(ON)	ID
N-Channel	100V	110mΩ	14A
P-Channel	-100V	200mΩ	-10A

Applications

- Power Management
- Load Switch
- DC/DC Converter

TO-252-4L Pin Configuration



Type	Package	Marking
CMD510B	TO-252-4L	CMD510B

Thermal Characteristics: p-channel

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Maximum Junction-to-Ambient (Steady-State)	---	60	$^{\circ}C/W$
$R_{\theta JC}$	Maximum Junction-to-Case (Steady-State)	---	3.9	$^{\circ}C/W$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	100	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=10A$	---	---	110	mΩ
		$V_{GS}=4.5V, I_D=10A$	---	---	130	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	1	---	2.5	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=100V, V_{GS}=0V$	---	---	1	uA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	±100	nA
g_{fs}	Forward Transconductance	$V_{DS}=5V, I_D=10A$	---	12	---	S
Q_g	Total Gate Charge	$V_{DD}=40V, V_{GS}=10V, I_D=4.3A$	---	14	---	nC
Q_{gs}	Gate-Source Charge		---	2	---	
Q_{gd}	Gate-Drain Charge		---	3	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=40V, V_{GS}=10V, I_D=4.3A$ $R_{GEN}=6\Omega$	---	8	---	ns
T_r	Rise Time		---	3	---	
$T_{d(off)}$	Turn-Off Delay Time		---	17	---	
T_f	Fall Time		---	3	---	
C_{iss}	Input Capacitance	$V_{DS}=20V, V_{GS}=0V, f=1MHz$	---	1200	---	pF
C_{oss}	Output Capacitance		---	56	---	
C_{rss}	Reverse Transfer Capacitance		---	27	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V, \text{ Force Current}$	---	---	14	A
I_{SM}	Pulsed Source Current		---	---	42	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=10A, T_J=25^{\circ}C$	---	---	1.2	V

P Channel 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	-100	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =-10V, I _D =-10A	---	---	200	mΩ
		V _{GS} =-4.5V, I _D =-10A	---	---	240	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250μA	-1	---	-3	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-100V , V _{GS} =0V	---	---	-1	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} = ±20V , V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} = -5V, I _D =-10A	---	15	---	S
Q _g	Total Gate Charge (10V)	V _{DD} =-40V, V _{GS} =-10V, I _D =-2.8A	---	15	---	nC
Q _{gs}	Gate-Source Charge		---	2	---	
Q _{gd}	Gate-Drain Charge		---	3	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =-40V, V _{GS} =-10V, I _D =-2.8A R _{GEN} =6Ω	---	7	---	ns
T _r	Rise Time		---	4	---	
T _{d(off)}	Turn-Off Delay Time		---	26	---	
T _f	Fall Time		---	6	---	
C _{iss}	Input Capacitance	V _{DS} =-40V , V _{GS} =0V , f=1MHz	---	1400	---	pF
C _{oss}	Output Capacitance		---	50	---	
C _{rss}	Reverse Transfer Capacitance		---	25	---	

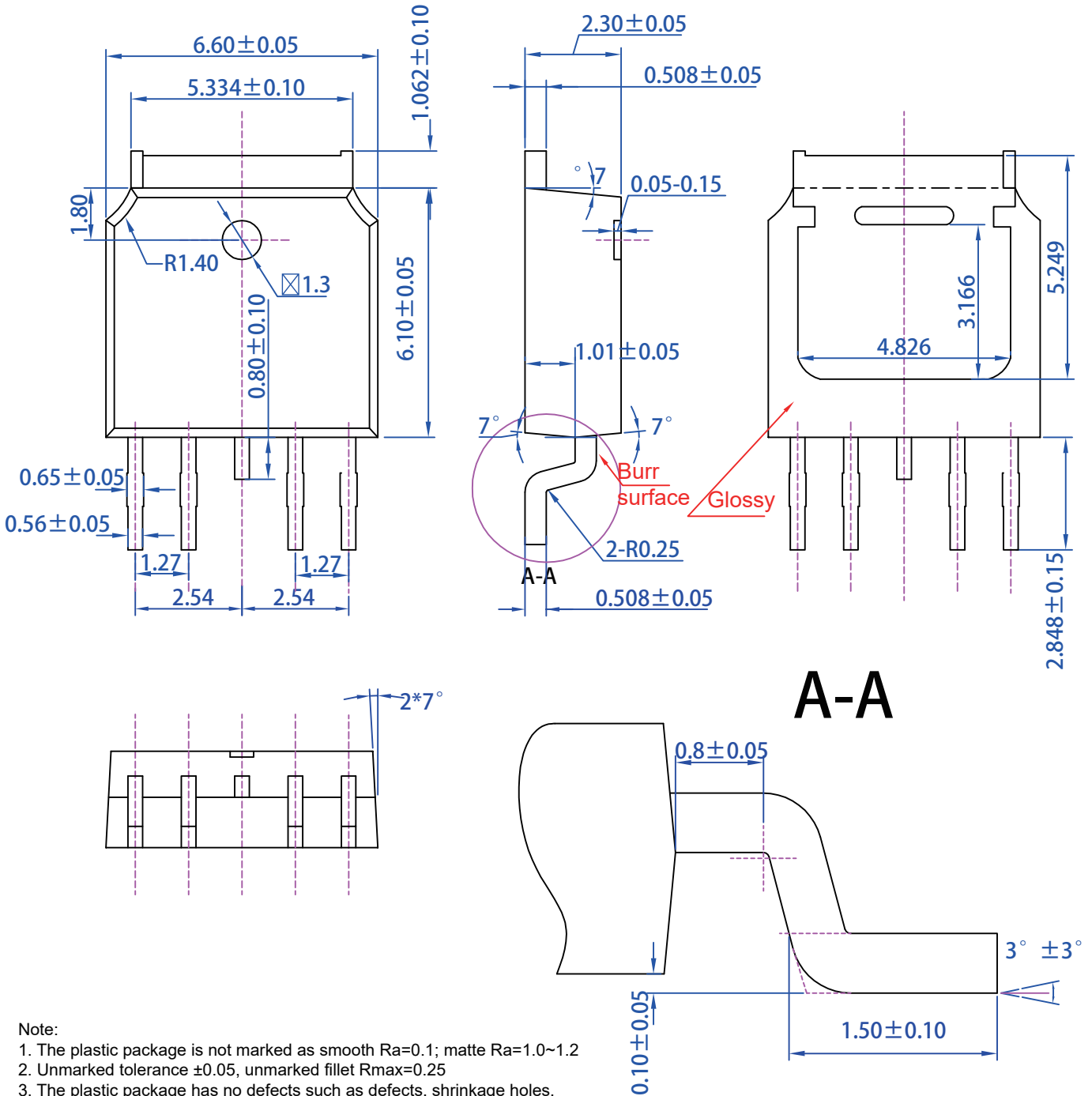
Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V , Force Current	---	---	-10	A
I _{SM}	Pulsed Source Current		---	---	-30	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V , I _S =-10A, T _J =25°C	---	---	-1.2	V

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.

Package Dimensions

N- and P-Channel Enhancement Mode MOSFET



Note:

1. The plastic package is not marked as smooth $Ra=0.1$; matte $Ra=1.0 \sim 1.2$
2. Unmarked tolerance ± 0.05 , unmarked fillet $R_{max}=0.25$
3. The plastic package has no defects such as defects, shrinkage holes, cracks, bubbles, etc.
4. Marking unit mm
5. The thimble hole is not allowed to protrude from the surface of the plastic package
6. Dislocation of upper and lower plastic package ≤ 0.05 ; plastic package center and lead Center misalignment of wire frames ≤ 0.05