

General Description

The CMSC1653B is designed to provide a high efficiency synchronous buck power stage with optimal layout and board space utilization. This device is well suited for use in compact DC/DC converter applications.

Features

- Low On-Resistance
- Low Gate Charge
- High Current Capability
- RoHS Compliant

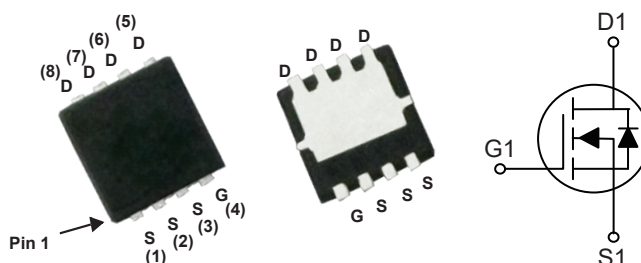
Product Summary

BVDSS	RDSON	ID
30V	7.7mΩ	40A

Applications

- DC/DC Converters in Computing, Servers, and POL
- Isolated DC/DC Converters in Telecom and Industrial

DFN-8 3.3x3.3 Pin Configuration



Type	Package	Marking
CMSC1653B	DFN-8 3.3*3.3	1653B

Maximum Ratings and Thermal Characteristics (T_A = 25 °C unless otherwise noted)

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	30	V
V _{GS}	Gate-Source Voltage	±20	V
I _D @T _C =25 °C	Continuous Drain Current	40	A
I _D @T _C =100 °C		28	A
I _{DM}	Pulsed Drain Current	120	A
EAS	Single Pulse Avalanche Energy ¹	68	mJ
P _D @T _C =25 °C	Total Power Dissipation	25	W
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction-ambient(Steady-State)	---	55	°C/W
R _{θJC}	Thermal Resistance Junction -Case(Steady-State)	---	5	°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 =20A	---	6.8	7.7	mΩ
		V _{GS} =4.5V , I _D =15A	---	9.2	12	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250μA	1	---	2.5	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =30V , 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 =20A	---	16	---	S
R _g	Gate Resistance	V _{DS} =0V , V _{GS} =0V , f=1MHz	---	1.7	---	Ω
Q _g	Total Gate Charge	V _{DS} =15V , V _{GS} =4.5V , I _D =12A	---	8	---	nC
Q _{gs}	Gate-Source Charge		---	1.7	---	
Q _{gd}	Gate-Drain Charge		---	2.5	---	
T _{d(on)}	Turn-On Delay Time	V _{DS} =15V , V _{GS} =4.5V , I _D =12A R _G =1.8Ω	---	7	---	ns
T _r	Rise Time		---	13	---	
T _{d(off)}	Turn-Off Delay Time		---	6.5	---	
T _f	Fall Time		---	5	---	
C _{iss}	Input Capacitance	V _{DS} =25V , V _{GS} =0V , f=1MHz	---	1000	---	pF
C _{oss}	Output Capacitance		---	100	---	
C _{rss}	Reverse Transfer Capacitance		---	90	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V , Force Current	---	---	40	A
I _{SM}	Pulsed Source Current		---	---	120	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V , I _S =20A	---	0.88	1.2	V

Notes:

1.The EAS data shows Max. rating .The test condition is V_{DS}=25V , V_{GS}=10V , L=0.5mH , I_{AS}=16.6A.

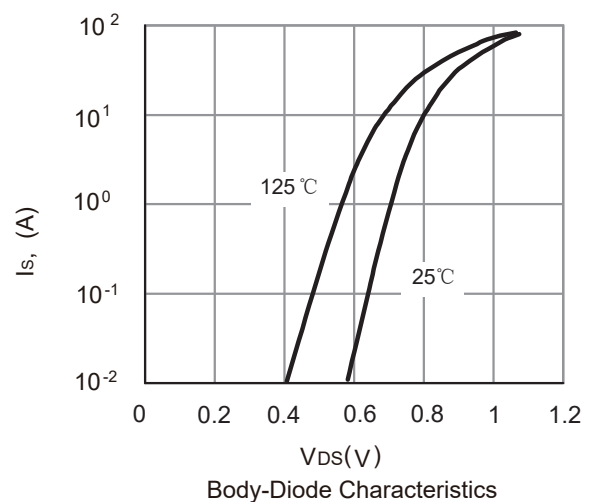
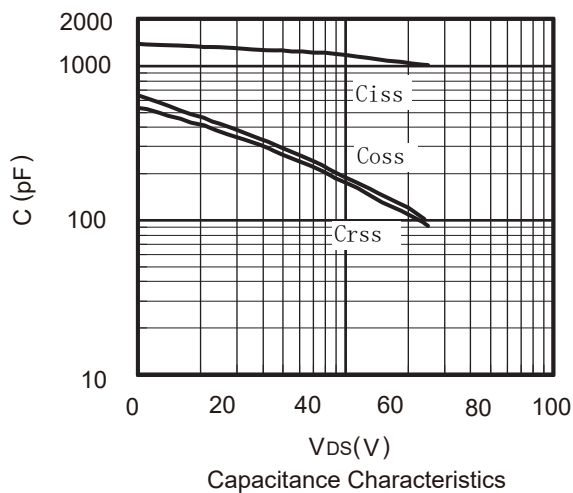
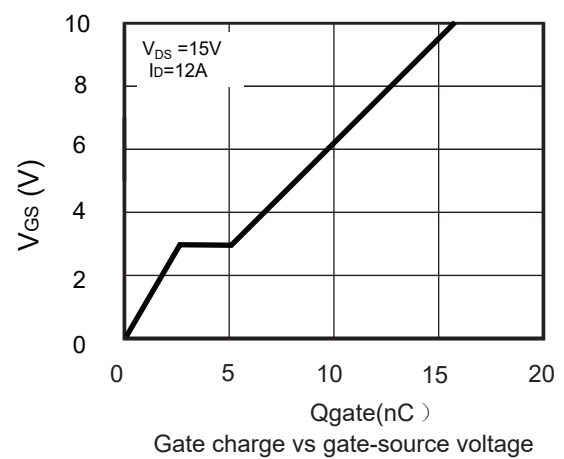
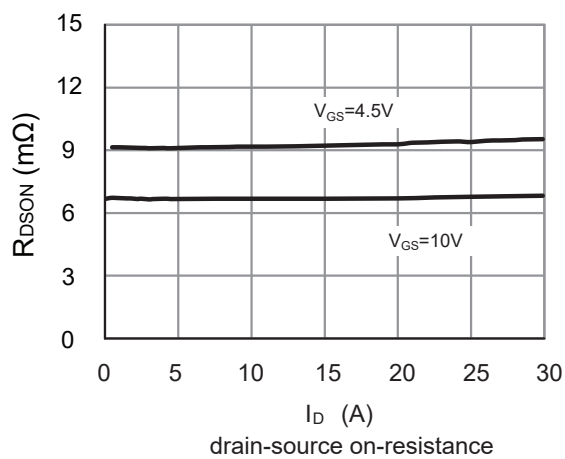
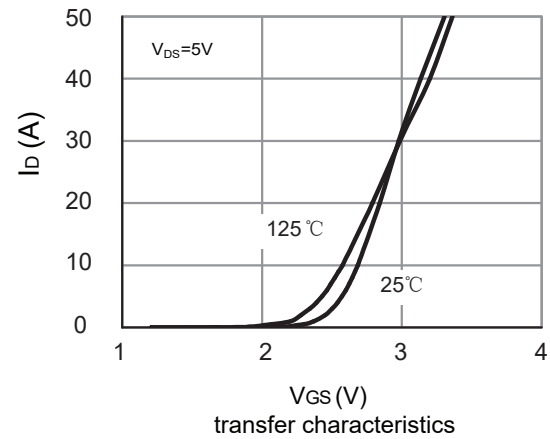
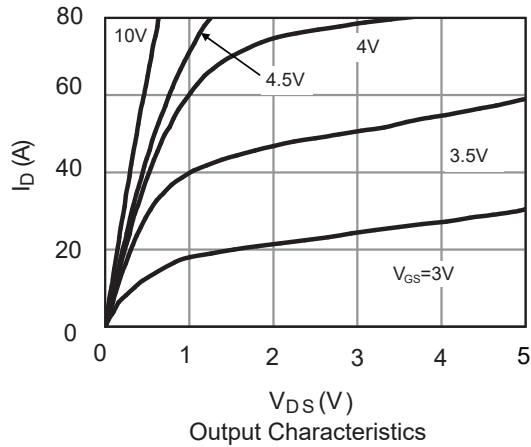
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Cmos reserves the right to improve product design ,functions and reliability without notice.

N-Channel Enhancement Mode MOSFET

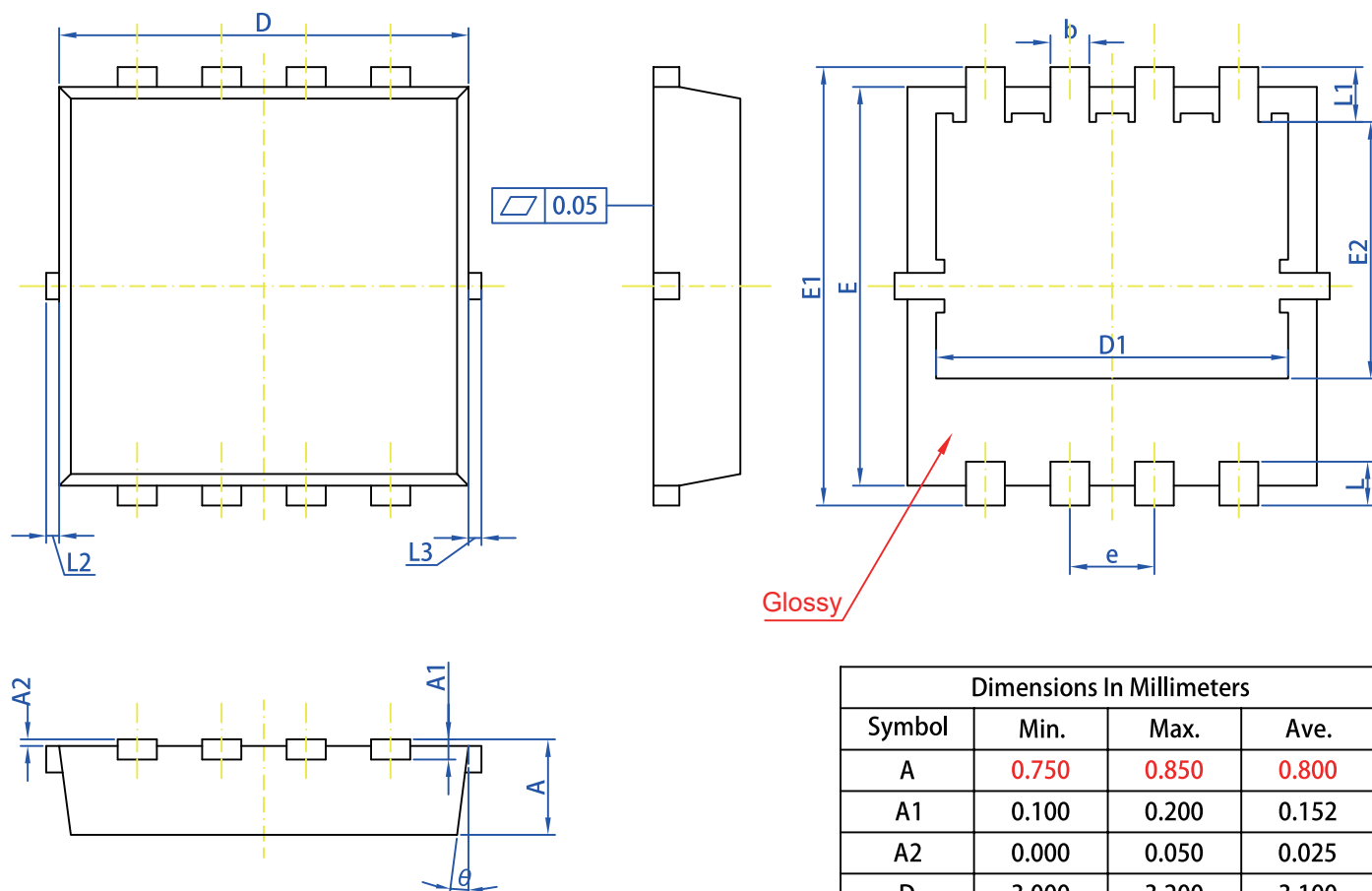
Typical Characteristics



Package Dimensions

N-Channel Enhancement Mode MOSFET

DFN-8 3.3*3.3 Package Outline Drawing



Glossy

Note:

1. Smooth surface $R_a=0.1$; unmarked surface is matte surface $R_a=1.0\sim 1.2$
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. Misalignment between the center of the plastic package and the center of the lead frames ≤ 0.05

Dimensions In Millimeters			
Symbol	Min.	Max.	Ave.
A	0.750	0.850	0.800
A1	0.100	0.200	0.152
A2	0.000	0.050	0.025
D	3.000	3.200	3.100
D1	2.610	2.810	2.710
E	3.000	3.200	3.100
E1	3.300	3.500	3.400
E2	1.830	2.030	1.930
b	0.200	0.400	0.300
e	0.550	0.750	0.650
L	0.350	0.550	0.450
L1	0.365	0.565	0.455
L2	0~0.100		
L3	0~0.100		
θ	6°	12°	9°