CMSC1653

Cmos

N-Channel Enhancement Mode MOSET

General Description

The CMSC1653 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

- 30V,40A, RDS(ON) =7.7mΩ @VGS = 10V
- Low Gate Charge
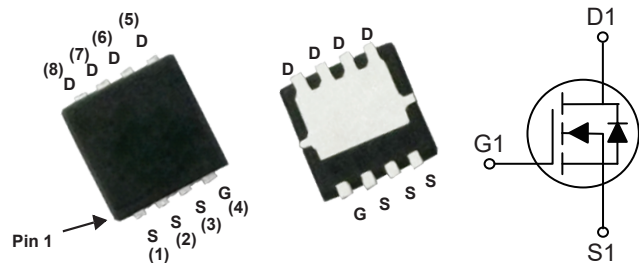- High Current Capability
- RoHS Compliant

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
CMSC1653	DFN-8 3.3*3.3	1653

Maximum Ratings and Thermal Characteristics (T$_A$ = 25℃ 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℃	Continuous Drain Current	40	A
I$_D$@T$_C$=100℃		22	A
I$_{DM}$	Pulsed Drain Current	160	A
EAS	Single Pulse Avalanche Energy[1]	65	mJ
P$_D$@T$_C$=25℃	Total Power Dissipation	25	W
T$_{STG}$	Storage Temperature Range	-55 to 150	℃
T$_J$	Operating Junction Temperature Range	-55 to 150	℃

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R$_{θJA}$	Thermal Resistance Junction-ambient(Steady-State)	---	90	℃/W
R$_{θJC}$	Thermal Resistance Junction -Case(Steady-State)	---	5.4	℃/W

Electrical Characteristics (T$_J$=25 ℃ 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	---	---	7.7	mΩ
		V$_{GS}$=4.5V , I$_D$=20A	---	---	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
gfs	Forward Transconductance	V$_{DS}$=10V , I$_D$=5A	---	18	---	S
R$_g$	Gate Resistance	V$_{DS}$=0V , V$_{GS}$=0V , f=1MHz	---	1.3	---	Ω
Q$_g$	Total Gate Charge	V$_{DS}$=15V , V$_{GS}$=10V , I$_D$=13A	---	8	---	nC
Q$_{gs}$	Gate-Source Charge		---	1	---	
Q$_{gd}$	Gate-Drain Charge		---	2	---	
T$_{d(on)}$	Turn-On Delay Time	V$_{DS}$=15V , V$_{GS}$=10V , R$_L$ =1.2Ω R$_{GEN}$=3Ω	---	3.5	---	ns
T$_r$	Rise Time		---	2.8	---	
T$_{d(off)}$	Turn-Off Delay Time		---	16.5	---	
T$_f$	Fall Time		---	3	---	
C$_{iss}$	Input Capacitance	V$_{DS}$=15V , V$_{GS}$=0V , f=1MHz	---	1400	---	pF
C$_{oss}$	Output Capacitance		---	230	---	
C$_{rss}$	Reverse Transfer Capacitance		---	28	---	

Diode Characteristics

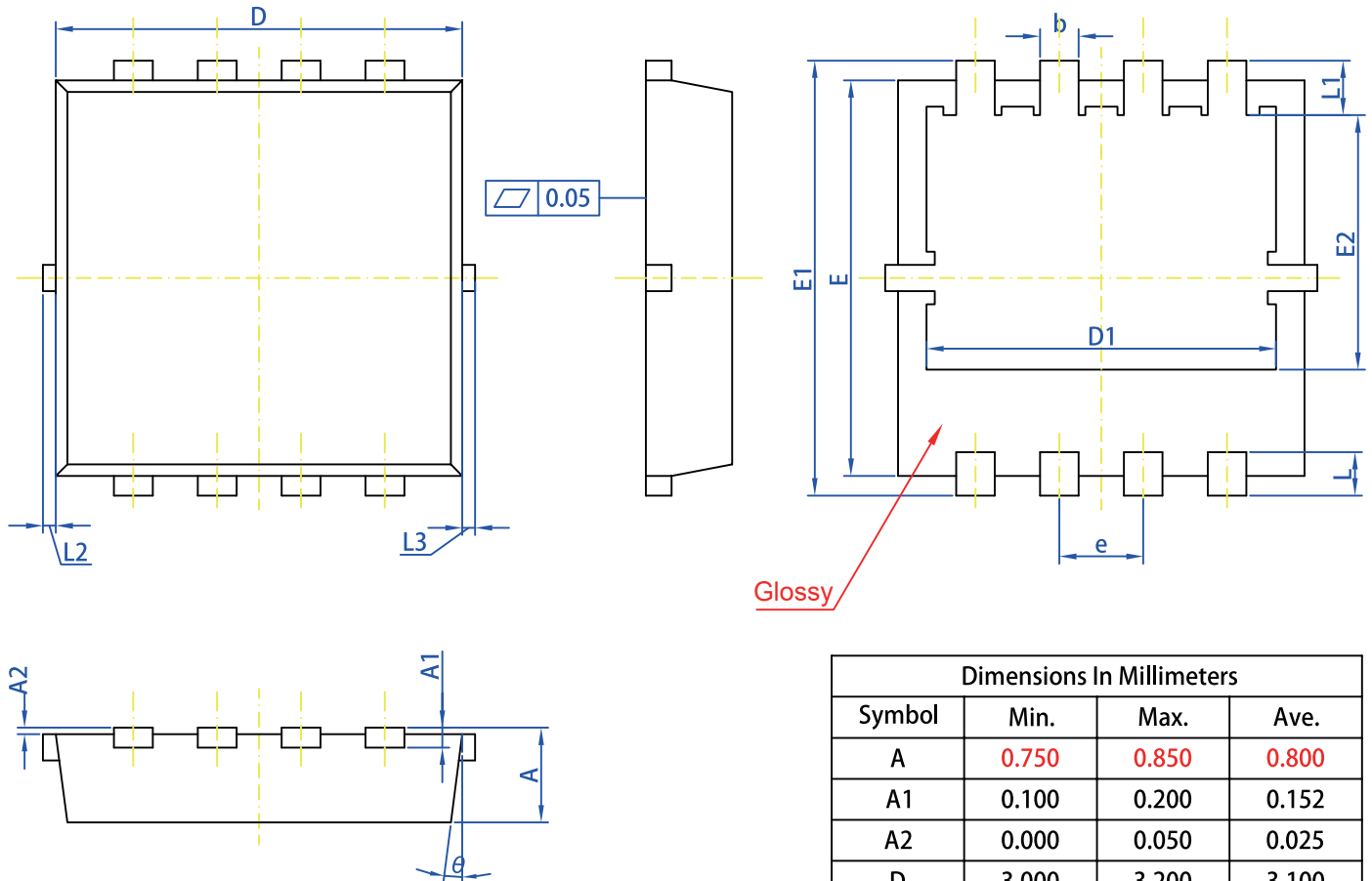| Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I$_S$	Continuous Source Current	V$_G$=V$_D$=0V , Force Current	---	---	40	A
V$_{SD}$	Diode Forward Voltage	V$_{GS}$=0V , I$_S$=20A	---	---	1	V

Notes:

1. L=1.3mH , I$_{AS}$=10A ,V$_D$=15V, Starting T$_J$=25℃.

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.

Package Dimensions

DFN-8 3.3*3.3 Package Outline Drawing

0.05

Glossy

Note:

1. Smooth surface Ra=0.1; unmarked surface is matte surface Ra=1.0~1.2
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 frame≤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°