

### General Description

The CMSL005N04 uses advanced SGT technology to provide excellent RDS(ON). It can be used in a wide variety of applications.

### Features

- Low On-Resistance
- 100% avalanche tested
- Surface Mount Package
- RoHS Compliant

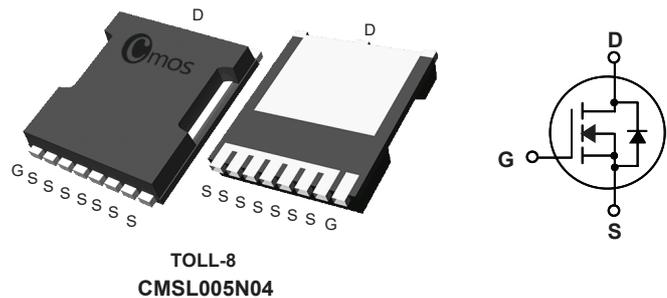
### Product Summary

BVDSS	R <sub>DS(on)</sub> max.	ID
40V	0.5mΩ	500A

### Applications

- Motor Driver
- Battery Protection
- Power Distribution

### TOLL-8 Pin Configuration



### Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V <sub>DS</sub>	Drain-Source Voltage	40	V
V <sub>GS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub> @T <sub>C</sub> =25°C	Continuous Drain Current	500	A
I <sub>D</sub> @T <sub>C</sub> =100°C	Continuous Drain Current	350	A
I <sub>DM</sub>	Pulsed Drain Current	2000	A
EAS	Single Pulse Avalanche Energy <sup>1</sup>	4605	mJ
P <sub>D</sub> @T <sub>C</sub> =25°C	Total Power Dissipation	500	W
T <sub>STG</sub>	Storage Temperature Range	-55 to 150	°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to 150	°C

### Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
R <sub>θJA</sub>	Thermal Resistance Junction-ambient <sup>2</sup>	---	50	°C/W
R <sub>θJC</sub>	Thermal Resistance Junction-case	---	0.25	°C/W

**Electrical Characteristics ( $T_J=25^{\circ}\text{C}$  , unless otherwise noted)**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V$ , $I_D=250\mu A$	40	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V$ , $I_D=30A$	---	0.38	0.5	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$ , $I_D=250\mu A$	2.0	---	4.0	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=40V$ , $V_{GS}=0V$	---	---	1	μA
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V$ , $V_{DS}=0V$	---	---	±100	nA
$g_{fs}$	Forward Transconductance	$V_{DS}=10V$ , $I_D=20A$	---	72	---	S
$R_g$	Gate Resistance	$V_{DS}=0V$ , $V_{GS}=0V$ , $f=1\text{MHz}$	---	1.0	---	Ω
$Q_g$	Total Gate Charge	$I_D=64A$	---	240	---	nC
$Q_{gs}$	Gate-Source Charge	$V_{DD}=20V$	---	76	---	
$Q_{gd}$	Gate-Drain Charge	$V_{GS}=0$ to 10V	---	35	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=20V$ $V_{GS}=10V$ $R_{GEN}=6\Omega$ , $I_D=64A$	---	63	---	ns
$T_r$	Rise Time		---	62	---	
$T_{d(off)}$	Turn-Off Delay Time		---	101	---	
$T_f$	Fall Time		---	43	---	
$C_{iss}$	Input Capacitance	$V_{DS}=25V$ , $V_{GS}=0V$ , $f=1\text{MHz}$	---	23350	---	pF
$C_{oss}$	Output Capacitance		---	4250	---	
$C_{rss}$	Reverse Transfer Capacitance		---	3980	---	

**Diode Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Continuous Source Current	$V_G=V_D=0V$ , Force Current	---	---	500	A
$I_{SM}$	Pulsed Source Current		---	---	2000	A
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V$ , $I_S=30A$ , $T_J=25^{\circ}\text{C}$	---	0.72	1.3	V

Note :

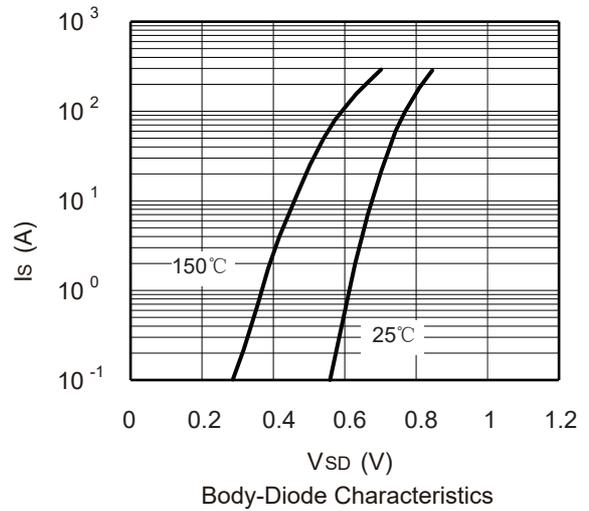
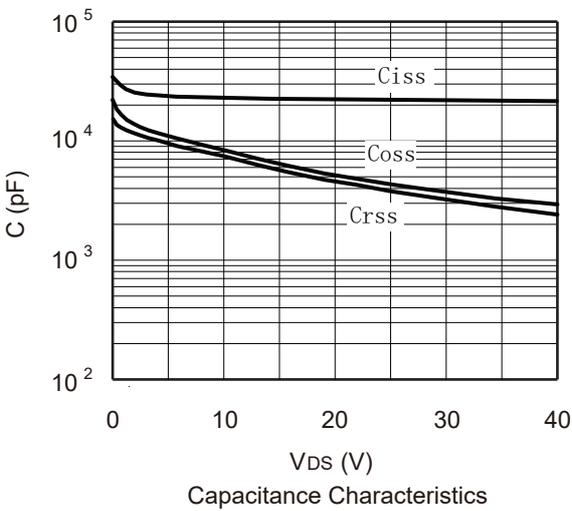
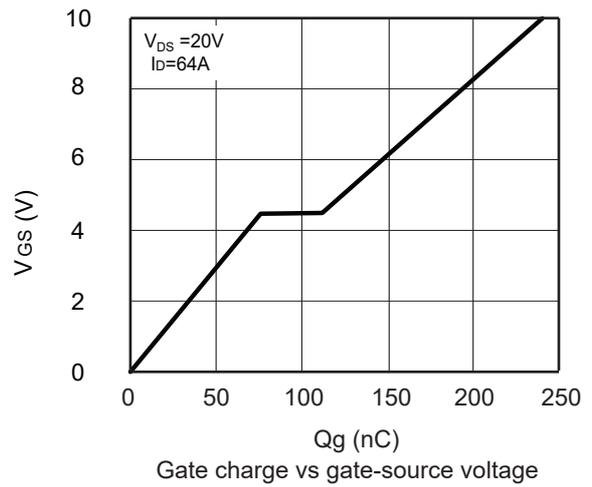
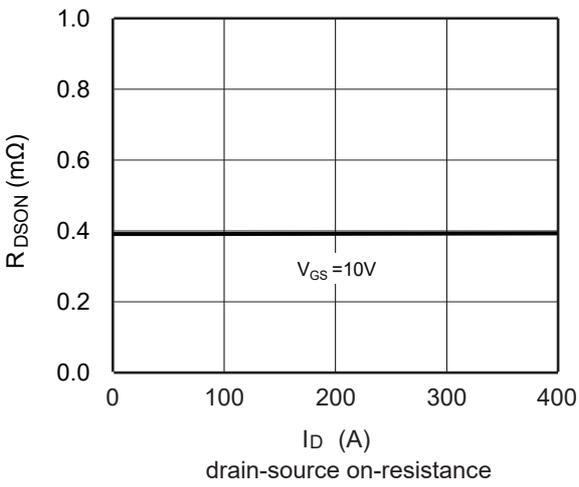
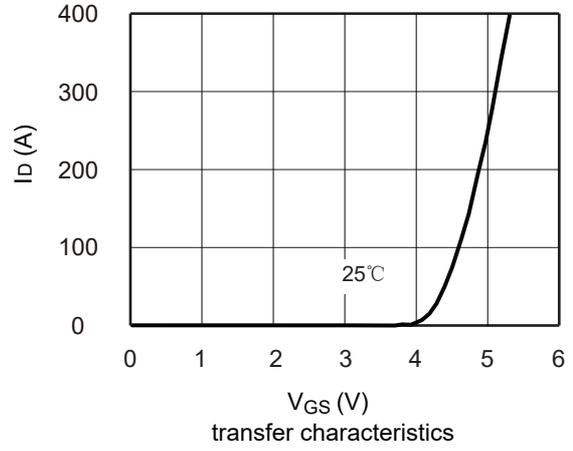
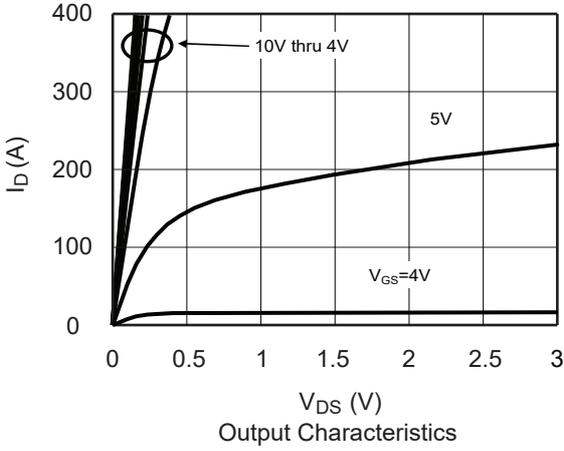
1.The EAS data shows Max. rating . The test condition is  $V_{DD}=65V$  ,  $V_{GS}=10V$  ,  $L=1\text{mH}$  ,  $I_{AS}=96A$ .

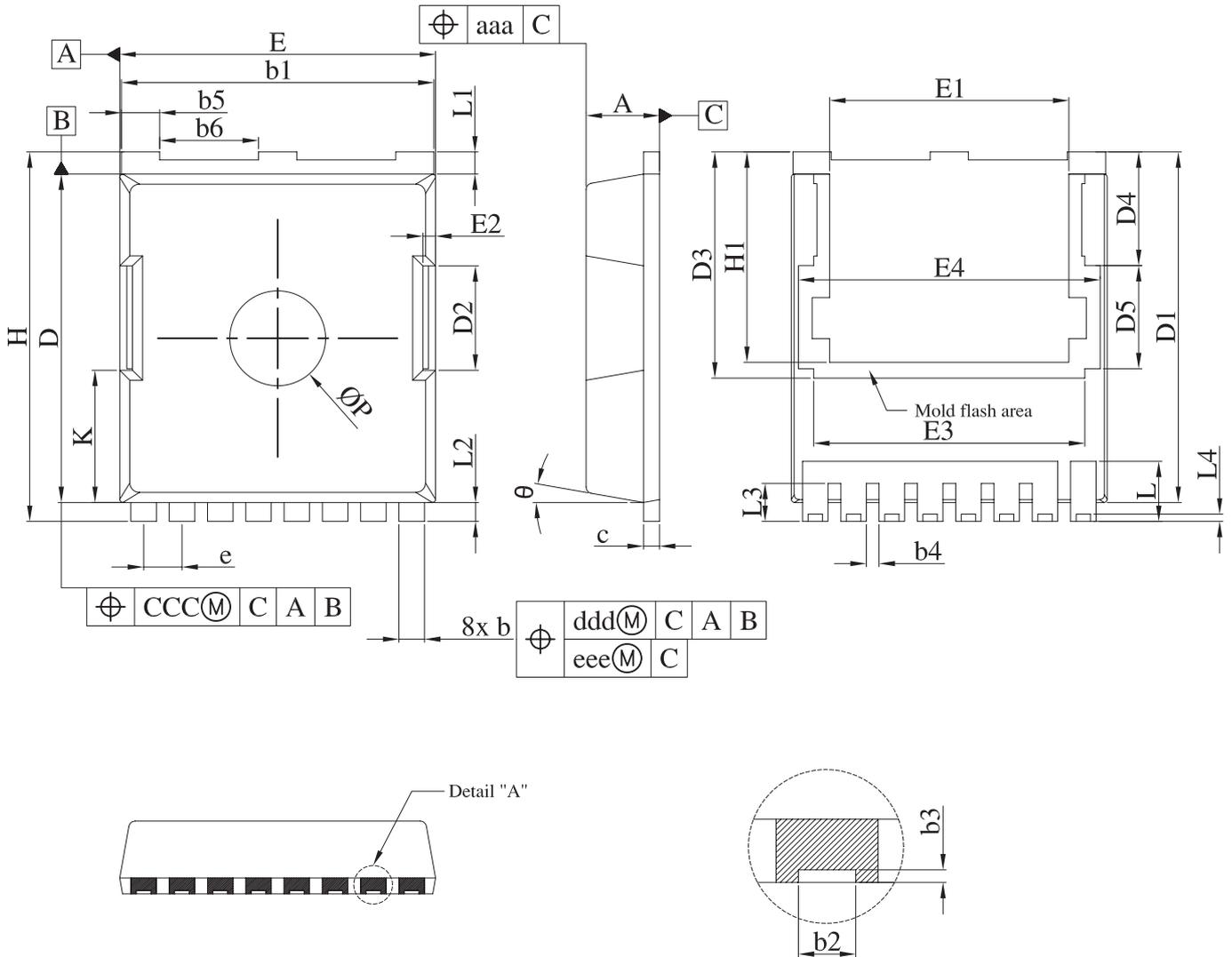
2.Device on 40mm x 40mm x 1.5mm epoxy PCB FR4 with 6 cm<sup>2</sup> (one layer, 70μm thick) copper area for drain connection. PCB is vertical in still air.

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.Please refer to the latest version of specification.

**Typical Characteristics**


**Package Dimension**
**TOLL-8**
**Unit :mm**


SYMBOL		A	b	b1	b2	b3	b4	b5	b6	c	D	D1	D2	D3	D4	D5	e	E	E1
MILLIMETER	MIN.	2.2	0.7	9.7	0.36	0.05	0.3	1.1	3	0.4	10.28	10.98	3.2	7.15	3.59	3.26	1.1	9.8	7.4
	TYP.	2.3	0.8	9.8	0.45	0.1	0.4	1.2	3.1	0.5	10.38	11.08	3.3				1.2	9.9	7.5
	MAX.	2.4	0.9	9.9	0.55	/	0.5	1.3	3.2	0.6	10.55	11.18	3.4				1.3	10	7.6
SYMBOL		E2	E3	E4	H	H1	K	L	L1	L2	L3	L4	P	θ	aaa	ccc	ddd	eee	
MILLIMETER	MIN.	0.3	8.5	9.46	11.5	6.55	4.08	1.6	0.5	0.5	1	0.13	2.85	10° REF	0.2	0.2	0.25	0.2	
	TYP.	0.4			11.68	6.65	4.18	1.9	0.7	0.6	1.2	0.23	3						
	MAX.	0.5			11.85	6.75	4.28	2.1	0.9	0.7	1.3	0.33	3.15						