CMSL005N04

40V, 0.38mΩ typ., 500A N-Channel MOSFET

General Description

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

Product Summary

BVDSS	$R_{DS(on)}$ max.	ID
40V	0.5mΩ	500A

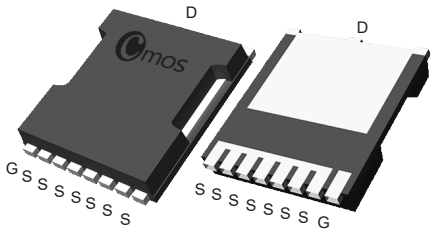
Applications

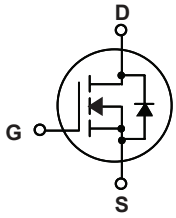
- Motor Driver
- Battery Protection
- Power Distribution

Features

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

TOLL-8 Pin Configuration





TOLL-8
CMSL005N04

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current	500	A
I_D@T_C=100℃	Continuous Drain Current	350	A
I_{DM}	Pulsed Drain Current	2000	A
EAS	Single Pulse Avalanche Energy[1]	4605	mJ
P_D@T_C=25℃	Total Power Dissipation	500	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient[2]	---	50	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-case	---	0.25	℃/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=250uA	40	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=30A	---	0.38	0.5	mΩ
		V_{GS}=4.5V , I_D=20A	---	0.63	0.8	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.0	---	3.0	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=40V , 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=20A	---	80	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	2.8	---	Ω
Q_g	Total Gate Charge	I_D=64A V_{DD}=20V V_{GS}=0 to 10V	---	230	---	nC
Q_{gs}	Gate-Source Charge		---	70	---	
Q_{gd}	Gate-Drain Charge		---	30	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=20V V_{GS} =10V R_{GEN}= 6Ω , 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=1MHz	---	17100	---	pF
C_{oss}	Output Capacitance		---	4250	---	
C_{rss}	Reverse Transfer Capacitance		---	200	---	

Diode Characteristics

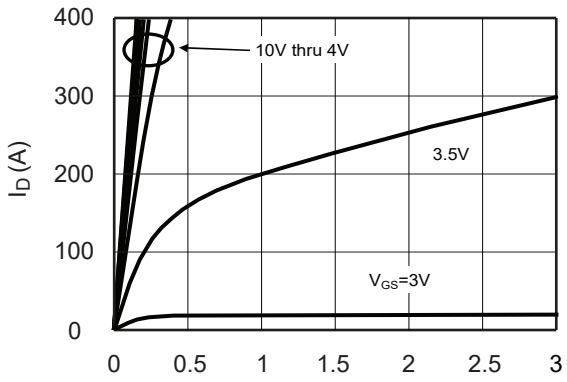
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	500	A
I_{SM}	Pulsed Source Current		---	---	2000	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=30A ,T_J=25℃	---	0.72	1.3	V

Note :

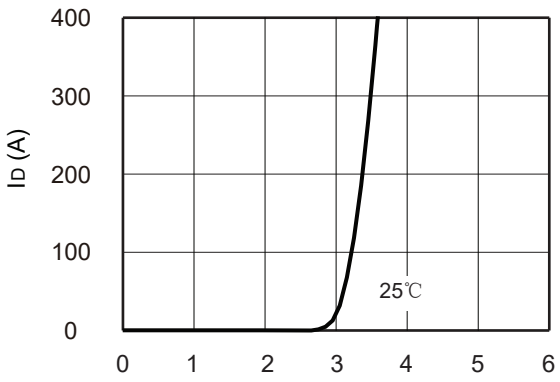
1.The EAS data shows Max. rating . The test condition is V_{DD}=65V , V_{GS}=10V , L=1mH , I_{AS}=96A.

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

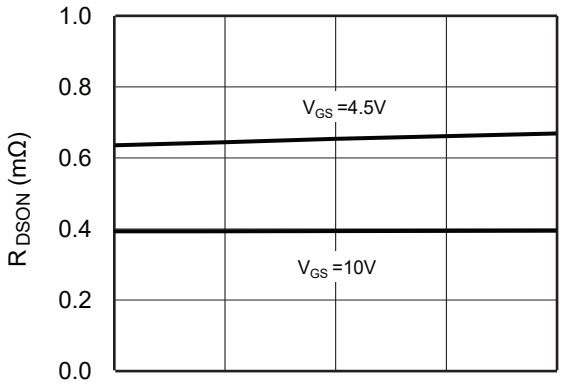
Typical Characteristics



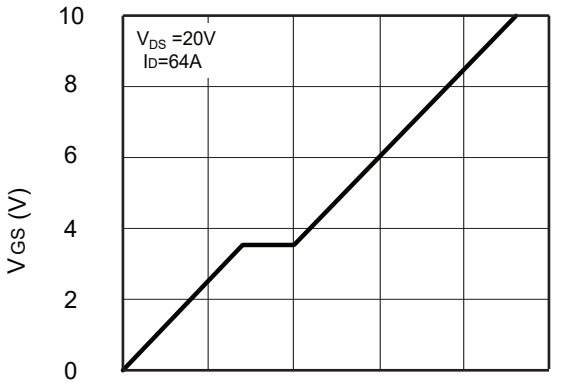
Output Characteristics



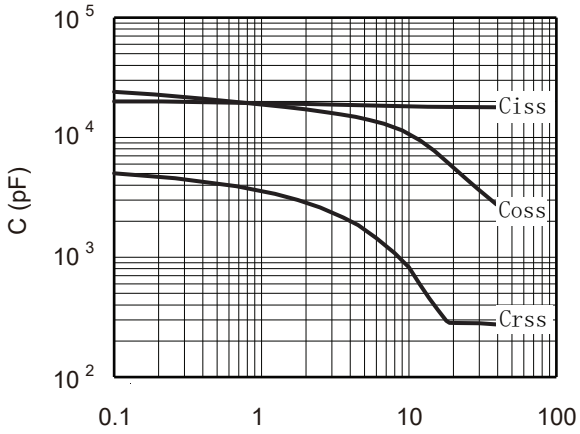
transfer characteristics



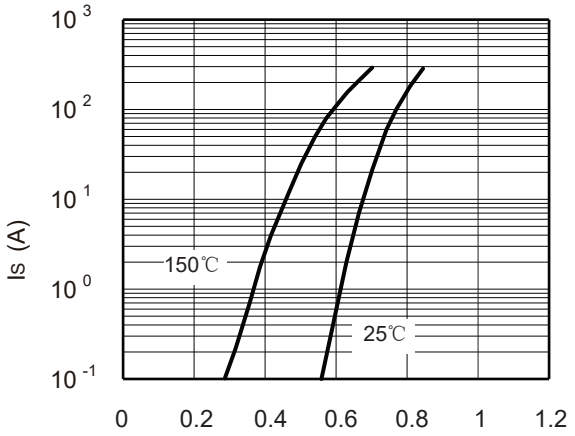
drain-source on-resistance



Gate charge vs gate-source voltage



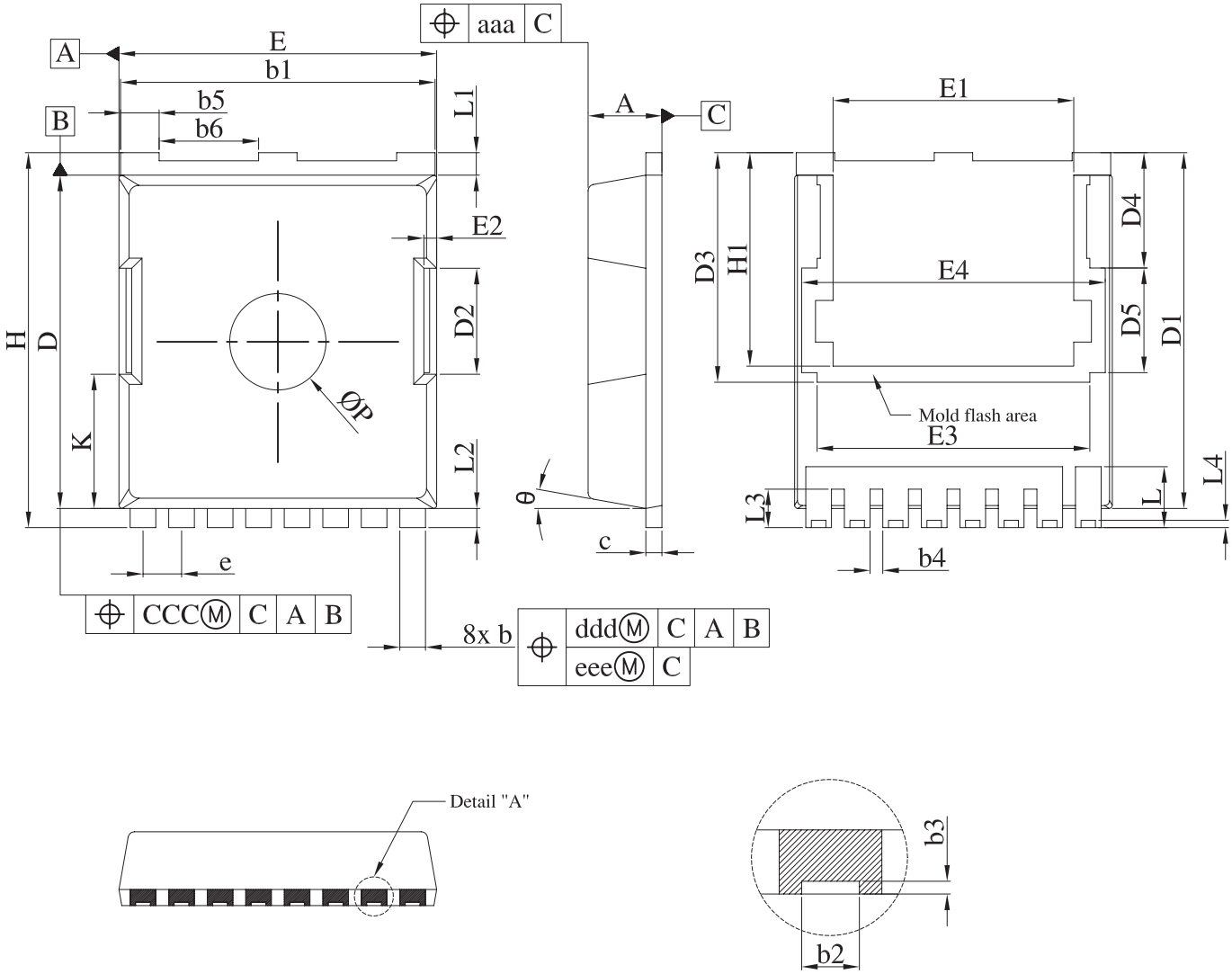
Capacitance Characteristics



Body-Diode 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						