30V N-Channel MOSFET

General Description

The 3090M uses advanced trench technology and design to provide excellent RDS(ON) with low gate charge. It can be used in a wide variety of applications.The 3090M meet the RoHS and Green Product requirement ,100% EAS guaranteed with full function reliability approved.

Product Summary

BVDSS	RDSON	ID
30V	8.5mΩ	90A

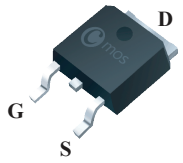
Applications

- High Frequency Point-of-Load Synchronous Buck Converter for MB/NB/UMPC/VGA
- Networking DC-DC Power System
- Load Switch

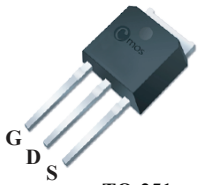
Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- 100% avalanche tested
- RoHS Compliant

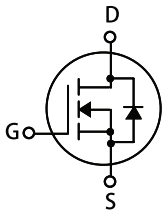
TO252 / TO251 Pin Configuration



TO-252



TO-251



Type	Package	Marking
CMD3090M	TO-252	CMD3090M
CMU3090M	TO-251	CMU3090M

Absolute Maximum Ratings

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	90	A
I_D@T_C=100℃	Continuous Drain Current	60	A
I_{DM}	Pulsed Drain Current	360	A
EAS	Single Pulse Avalanche Energy [1]	90	mJ
P_D@T_C=25℃	Total Power Dissipation	85	W
T_{STG}	Storage Temperature Range	-55 to 175	℃
T_J	Operating Junction Temperature Range	-55 to 175	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient(Steady-State)	---	55	℃/W
$R_{\theta JC}$	Thermal Resistance Junction -Case(Steady-State)	---	3	℃/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	30	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=20A	---	6.9	8.5	mΩ
		V_{GS}=4.5V , I_D=15A	---	10	13	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D = 250μA	1	1.5	2.5	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=30V , V_{GS}=0V , T_J=25℃	---	---	1	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS} = ±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=20A	---	15	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	2.5	---	Ω
Q_g	Total Gate Charge	V_{DS}=15V , V_{GS}=10V, I_D=20A	---	18	---	nC
Q_{gs}	Gate-Source Charge		---	3	---	
Q_{gd}	Gate-Drain Charge		---	4	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DS}=15V V_{GS}=10V R_L= 0.75Ω R_G=3Ω	---	8	---	ns
T_r	Rise Time		---	4	---	
$T_{d(off)}$	Turn-Off Delay Time		---	20	---	
T_f	Fall Time		---	4	---	
C_{iss}	Input Capacitance	V_{DS}=25V , V_{GS}=0V , f=1MHz	---	1200	---	pF
C_{oss}	Output Capacitance		---	120	---	
C_{rss}	Reverse Transfer Capacitance		---	100	---	

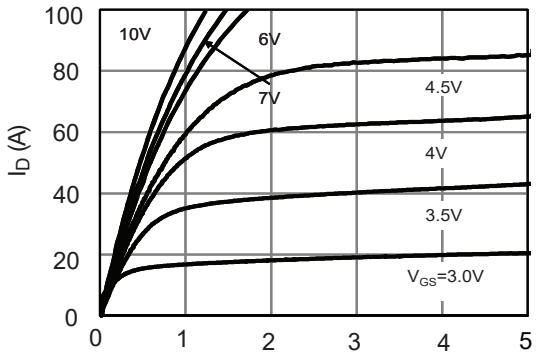
Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	90	A
I_{SM}	Pulsed Source Current		---	---	360	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=20A , T_J=25℃	---	0.88	1.2	V

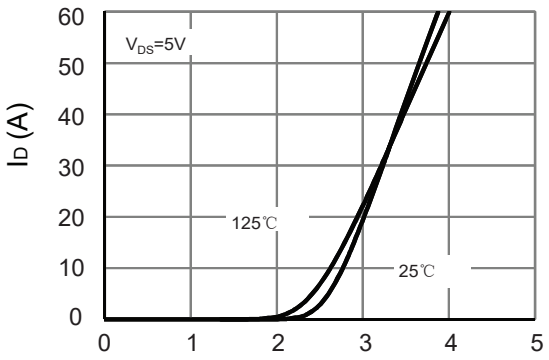
Note :

1.The test condition is V_{DD}=25V,V_{GS}=10V,L=0.5mH,I_{AS}=19A.

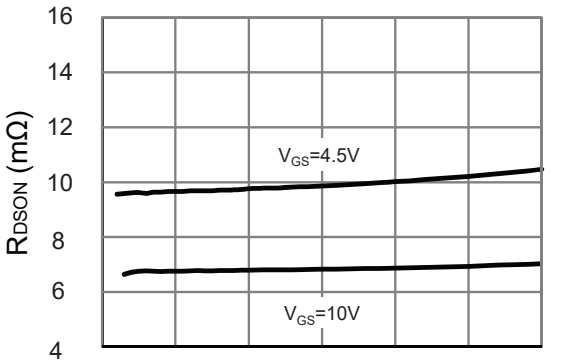
Typical Characteristics



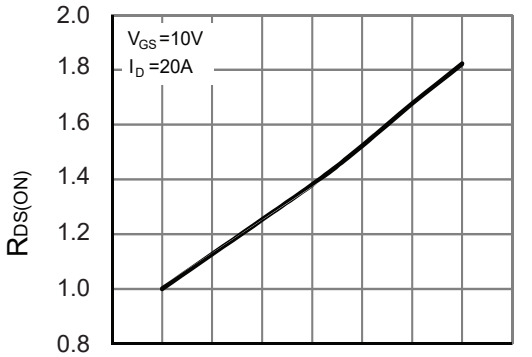
Output Characteristics



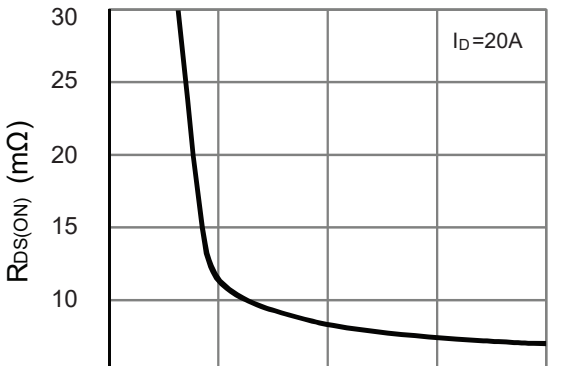
transfer characteristics



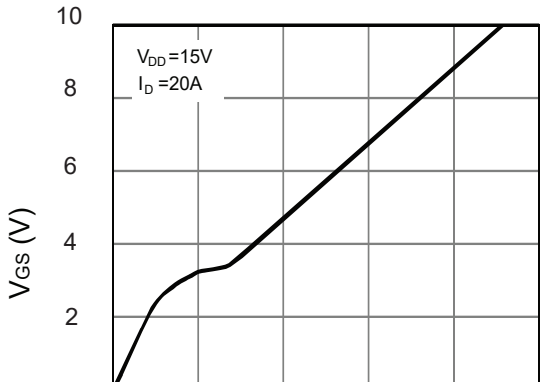
drain-source on-resistance



On-Resistance vs temperature

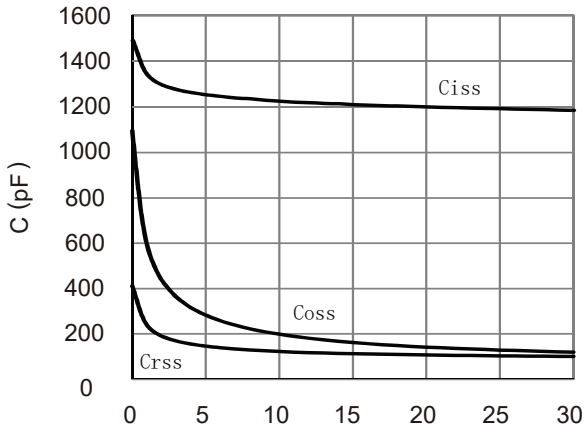


On-Resistance vs. Gate-Source Voltage

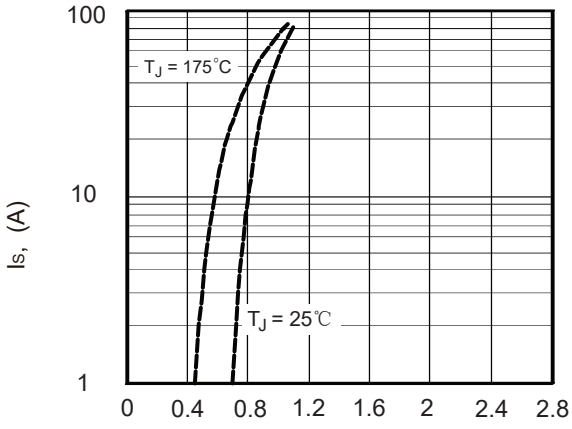


Gate charge vs gate-source voltage

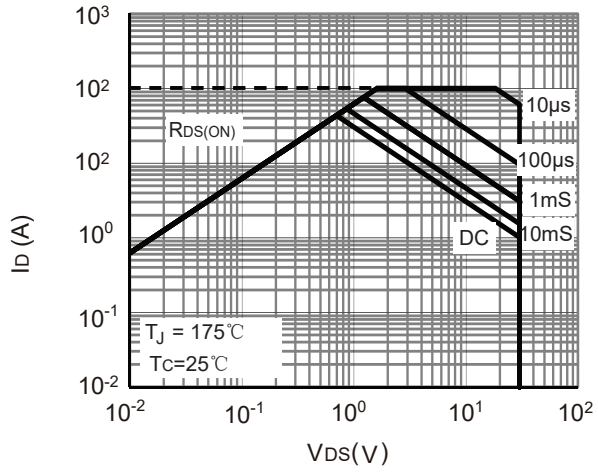
Typical Characteristics



Capacitance Characteristics



Body-Diode Characteristics



Maximum Forward Biased Safe Operating Area

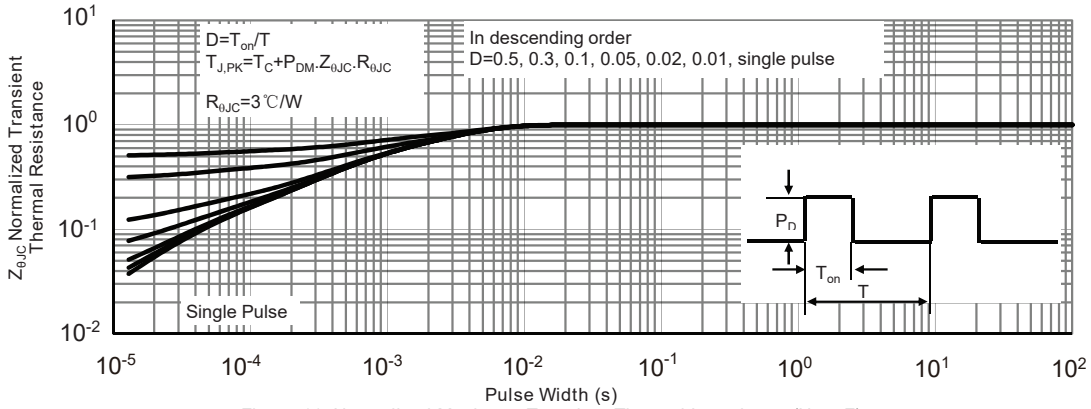


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)