CMSV65R190Q

650V, 180mΩ typ., 20A N-Channel Super Junction Power MOSFET

General Description

CMSV65R190Q is power MOSFET using Cmos's advanced super junction technology that can realize very low on-resistance and gate charge. It will provide much high efficiency by using optimized charge coupling technology. These user friendly devices give an advantage of Low EMI to designers as well as low switching loss.

Product Summary

BVDSS	$R_{DS(on)}$ max.	ID
650V	0.199Ω	20A

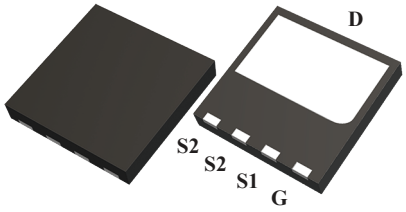
Applications

- Server and Telecom Power Supplies
- Solar Inverters
- Adaptors

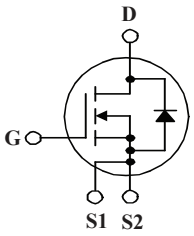
Features

- Multi-layer Epitaxial Chip Technology
- Low On-Resistance
- 100% avalanche tested
- RoHS Compliant

DFN-8 8x8 Pin Configuration



DFN-8 8x8
CMSV65R190Q



S1: Source 1
S2: Source 2

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	650	V
V_{GS}	Gate-Source Voltage	±30	V
I_D@T_C=25℃	Continuous Drain Current	20	A
I_D@T_C=100℃	Continuous Drain Current	12	A
I_{DM}	Pulsed Drain Current	80	A
EAS	Single Pulse Avalanche Energy (Note 1)	605	mJ
P_D@T_C=25℃	Total Power Dissipation	140	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	---	75	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-case	---	0.89	℃/W

650V, 180mΩ typ., 20A N-Channel Super Junction Power MOSFET

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	650	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=10A	---	0.18	0.199	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	2	---	4	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=600V , V_{GS}=0V	---	---	1	uA
		V_{DS}=600V , T_C=150℃	---	10	---	
I_{GSS}	Gate-Source Leakage Current	V_{GS}= ±30V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=10V, I_D =10A	---	16	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	8.2	---	Ω
Q_g	Total Gate Charge	I_D=20A V_{DS}=480V V_{GS}=10V	---	36	---	nC
Q_{gs}	Gate-Source Charge		---	9	---	
Q_{gd}	Gate-Drain Charge		---	14	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DS}=300V V_{GS}=10V I_D=20A R_G=25Ω	---	25	---	ns
T_r	Rise Time		---	90	---	
$T_{d(off)}$	Turn-Off Delay Time		---	212	---	
T_f	Fall Time		---	68	---	
C_{iss}	Input Capacitance	V_{DS}=100V , V_{GS}=0V , f=1MHz	---	1430	---	pF
C_{oss}	Output Capacitance		---	60	---	
C_{rss}	Reverse Transfer Capacitance		---	4.3	---	

Diode Characteristics

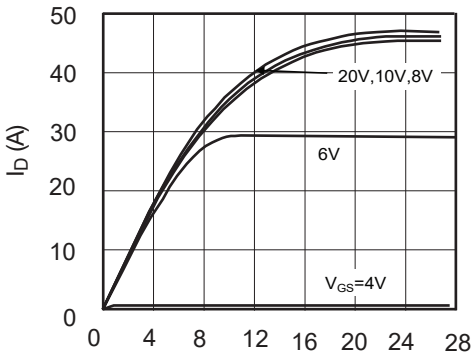
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	20	A
I_{SM}	Pulsed Source Current		---	---	80	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=20A ,T_J=25℃	---	0.95	1.4	V
t_{rr}	Reverse Recovery Time	di/dt = 100A/μs V_{DD}=100V , I_{SD}=20A	---	347	---	ns
Q_{rr}	Reverse Recovery Charge		---	5.3	---	μC

Note :

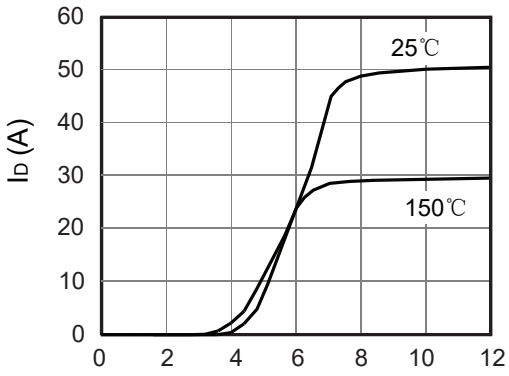
1.The EAS data shows Max. rating . The test condition is V_{DD}=50V , V_{GS}=10V , L=10mH , I_{AS} =11A.

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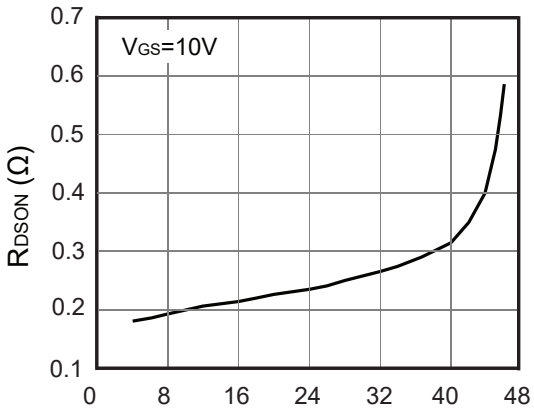
Typical Characteristics



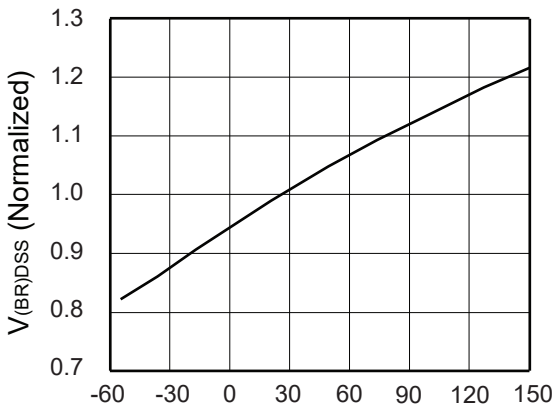
Output Characteristics



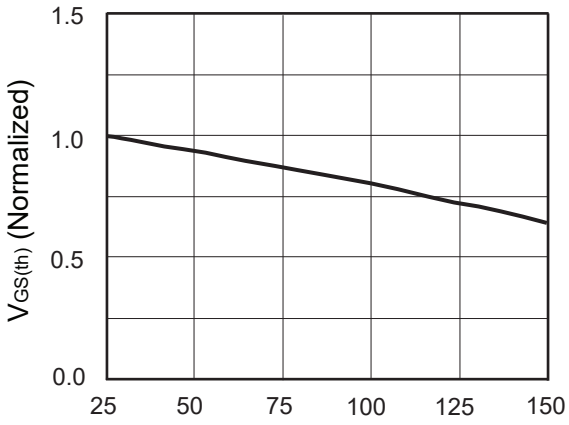
transfer characteristics



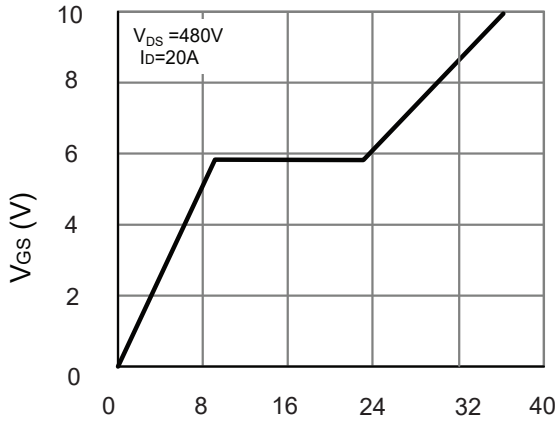
On-Resistance vs Drain Current



$V_{(BR)DSS}$ vs temperature

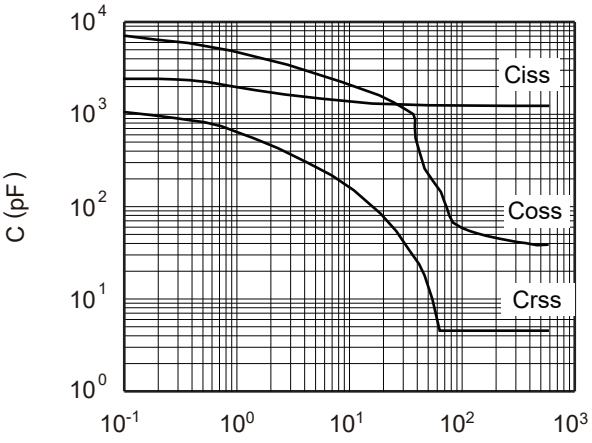


gate threshold voltage vs temperature

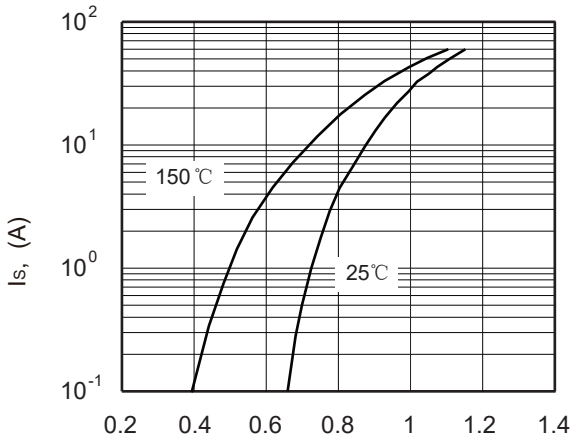


Gate charge vs gate-source voltage

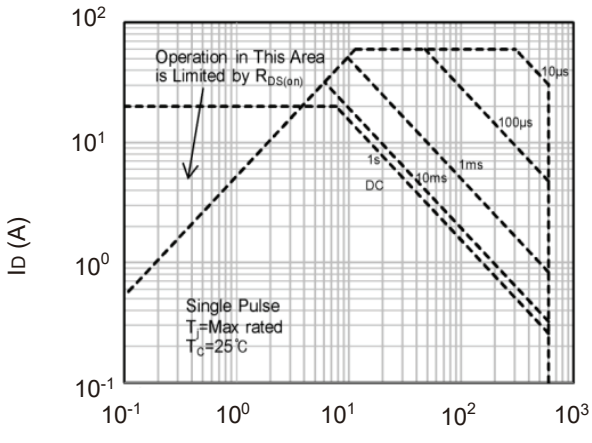
Typical Characteristics



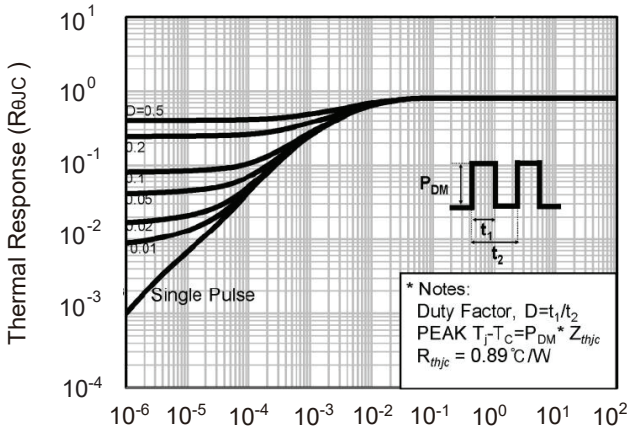
Capacitance Characteristics



Body-Diode Characteristics



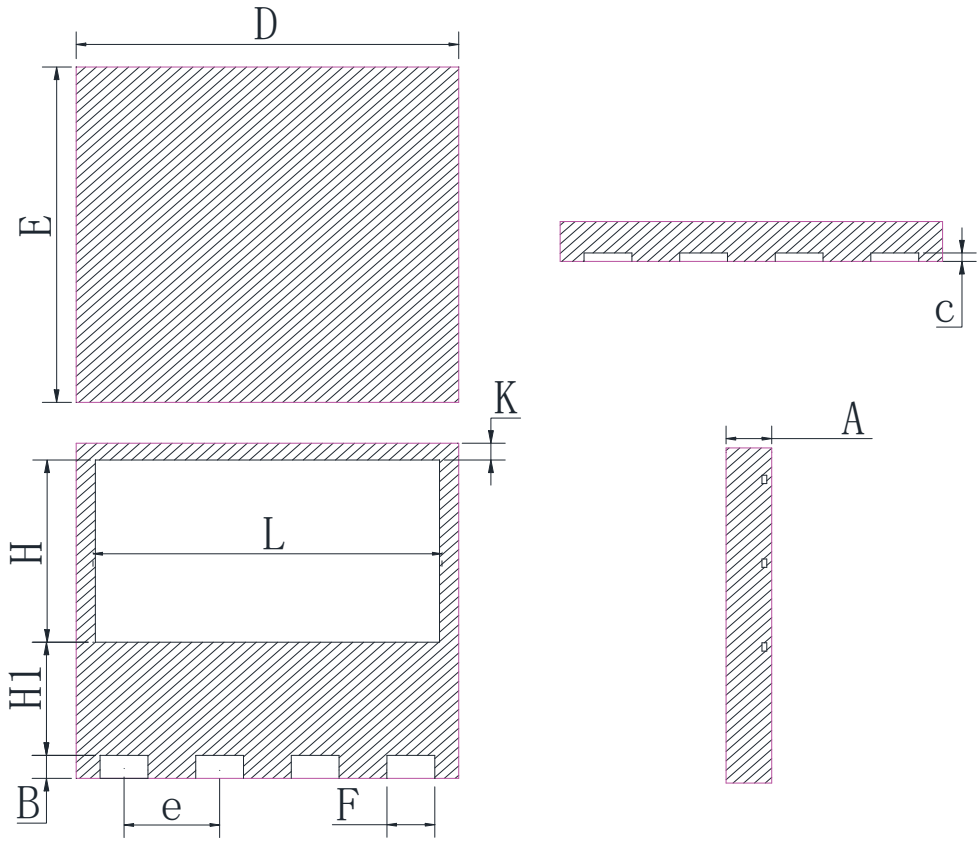
Safe operating area



transient thermal response curve

Package Dimension

DFN-8 8x8 Unit :mm



Symbol	Min	Typ	Max
A	0.90	0.95	1.00
B	0.45	0.55	0.65
C	0.153	0.203	0.253
D	7.90	8.00	8.10
E	7.90	8.00	8.10
e	1.90	2.00	2.10
F	0.90	1.00	1.10
H	4.20	4.35	4.45
H1	2.60	2.70	2.80
K	0.30	0.40	0.50
L	7.10	7.20	7.30