

CHONGQING CLOUDCHILD TECHNOLOGY CO., LTD

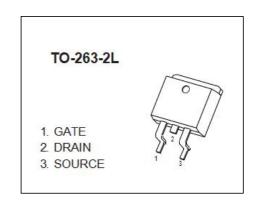
TO-263-2L Plastic-Encapsulate MOSFETS

CCMA160N10S N-Channel Power MOSFET

V _{DSS}	R _{DS(ON)} (Typ.)	I _D
100 V	3.5mΩ@10V	160A

DESCRIPTION

The CCMA160N10S provides excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.



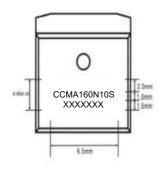
FEATURES

- Improved Gate, Avalanche and Dynamic dv/dt Ruggedness
- Fully Characterized Capacitance and Avalanche SOA
- Enhanced body diode dV/dt and dI/dt Capability
- AEC Q101 Qualified

APPLICATIONS

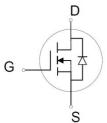
- High Efficiency Synchronous Rectification in SMPS
- Uninterruptible Power Supply
- High Speed Power Switching
- Hard Switched and High Frequency Circuits

MARKING



CCMA160N10S =Part No. XXXXXXX = Code

EQUIVALENT CIRCUIT



ABSOLUTE MAXIMUM RATINGS(T_c =25 $^{\circ}$ C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	100	V
Gate-Source Voltage	V _G s	±25	V
Continuous Drain Current	I _D	160	А
Pulsed Drain Current ¹	I _{DM}	640	А
Single Pulse Avalanche Energy ²	Eas	300	mJ
Total Power Dissipation	P _D	250	W
Thermal Resistance from Junction to Case	Rejc	0.6	°C/W
Operating Junction and Storage Temperature Range	TJ, TSTG	-55~ +175	$^{\circ}$
Soldering Temperature , for 10S(1.6mm from case)	-	260	°C

Notes:

^{1.} Repetitive Rating: Pulse width limited by maximum junction temperature.

^{2.} Limited by T_{Jmax} , starting $T_J = 25^{\circ}C$, L = 0.033mH, $R_G = 25\Omega$, $I_{AS} = 135A$, $V_{GS} = 10V$. Part not recommended for use above 135A, although measured, the limit value of I_{AS} is 195A.

MOSFET ELECTRICAL CHARACTERISTICS

TC=25℃ unless otherwise specified

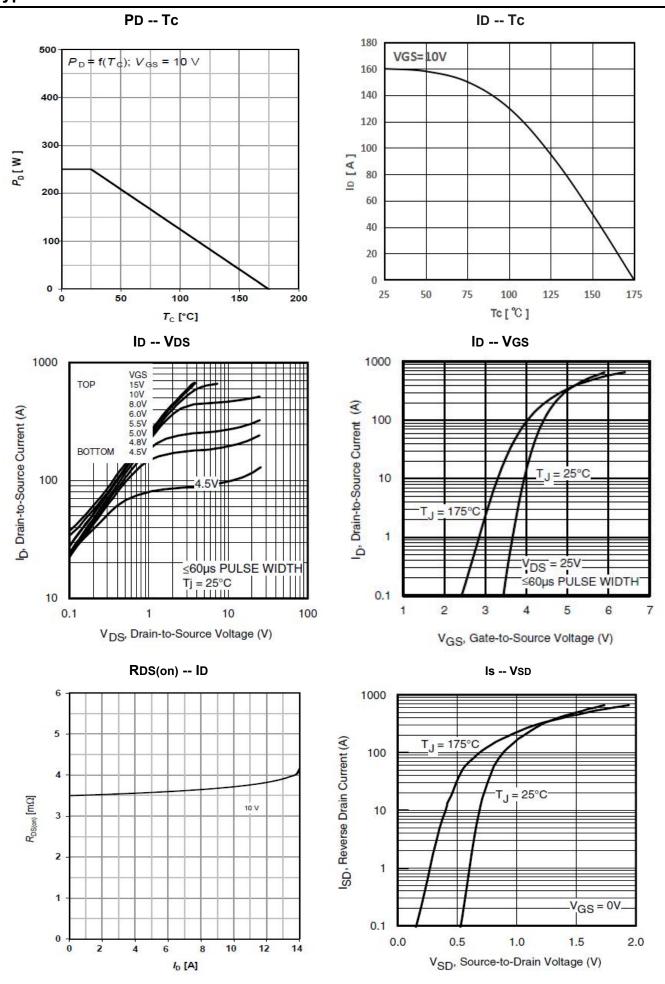
Parameter	Symbol	Test Condition	Min	Туре	Max	Unit
Off characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V _{GS} = 0V, I _D =250μA	100			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =100V,V _{GS} = 0V			1	μΑ
Gate-body leakage current	Igss	$V_{GS} = \pm 20V, V_{DS} = 0V$			±100	nA
On characteristics						
Gate threshold voltage	$V_{\text{GS(th)}}$	$V_{DS} = V_{GS}, I_D = 250 \mu A$	2.0	3.0	4.0	V
Drain-source on-resistance	$R_{\text{DS(on)}}$	V _{GS} =10V, I _D =1A		3.5	4.0	$m\Omega$
Transconductance	gfs	V _{DS} =10V, I _D =10A		46		S
Dynamic characteristics						
Input Capacitance	Ciss			5650		
Output Capacitance	Coss	V _{DS} =50V,V _{GS} =0V,f =1MHz		1200		pF
Reverse Transfer Capacitance	Crss			43		,
Gate resistance	Rg	V _{GS} = 0V,V _{DS} =0V,f=1MHz		0.8		Ω
Switching characteristics ¹						
Total Gate Charge	Q_g			105		
Gate-Source Charge	Q_{gs}	VDD=50V , VGS=10V , ID=75A		20		nC
Gate-Drain Charge	Q_{gd}			28		
Turn-on delay time	$t_{\text{d(on)}}$			28		
Turn-on rise time	t _r	VDD=50V , VGS=10V ,		32		ns
Turn-off delay time	$t_{\text{d(off)}}$	I _D =75A, R _G =2.5Ω		80		5
Turn-off fall time	t _f			61		
Drain-source Diode characteristics						
Diode Forward Voltage ¹	VsD	V _{GS} =0V , I _S =75A , T _J =25℃			1.3	V
Continuous Source Current ²	Is	Tc = 25 °C			160	Α
Pulsed drain-source diode forward current	Ism				640	Α
Reverse recovery time	trr	VGS=0V, IF=10A,		85		ns
Reverse recovery charge	Qrr	di/dt=100A/us		160		nC

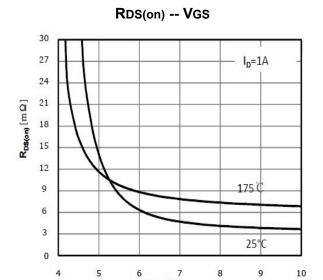
Note:

^{1.} Pulse Test: Pulse Width ≤ 400µs, Duty Cycle ≤ 2%.

^{2.} Calculated continuous current based on maximum allowable junction temperature. Bond wire current limit is 120A. Note that current limitations arising from heating of the device leads may occur with some lead mounting arrangements.

Typical Characteristics





3.2 3 2.8 2.6 2.6 2.4 2.2 2 1.8

100 TJ[°C]

125

150

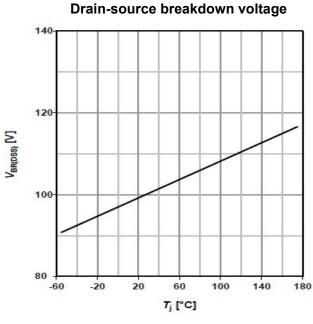
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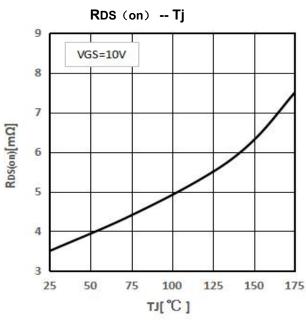
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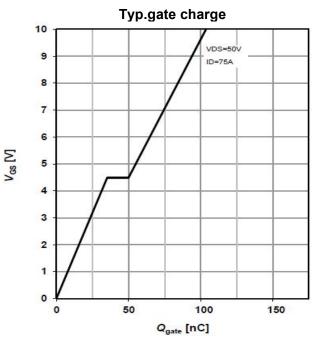
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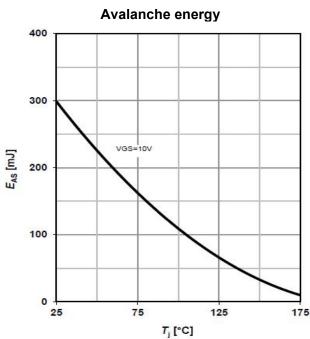
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Threshold Voltage



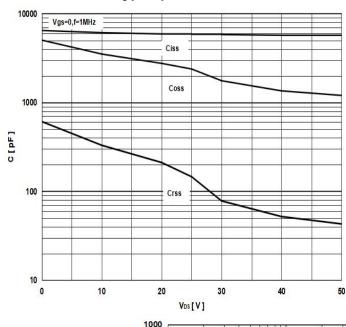


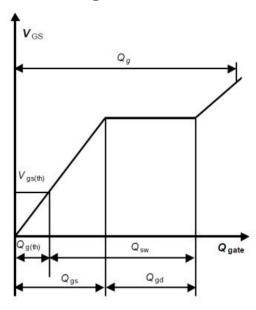


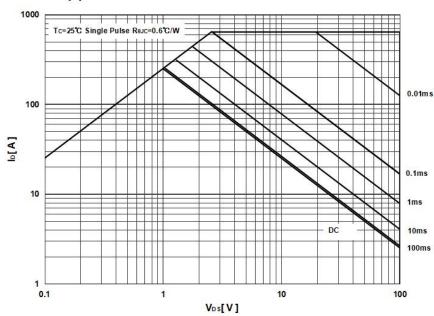




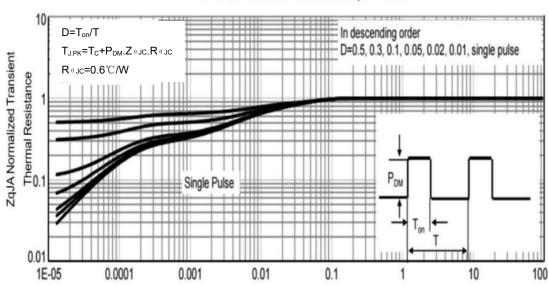
Gate charge waveforms



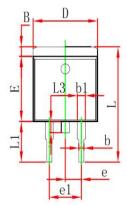


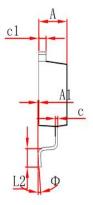


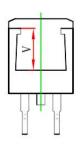
Normalized Thermal Transient Impedance



TO-263-2L Package Outline Dimensions

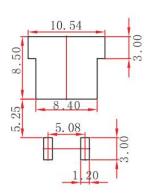






Dimensions In Millimeters		Dimensions In Inches	
Min.	Max.	Min.	Max.
4.470	4.670	0.176	0.184
0.000	0.150	0.000	0.006
1.120	1.420	0.044	0.056
0.710	0.910	0.028	0.036
1.170	1.370	0.046	0.054
0.310	0.530	0.012	0.021
1.170	1.370	0.046	0.054
10.010	10.310	0.394	0.406
8.500	8.900	0.335	0.350
2.540 TYP.		0.100	TYP.
4.980	5.180	0.196	0.204
14.940	15.500	0.588	0.610
4.950	5.450	0.195	0.215
2.340	2.740	0.092	0.108
1.300	1.700	0.051	0.067
0°	8°	0°	8°
	Min. 4.470 0.000 1.120 0.710 1.170 0.310 1.170 10.010 8.500 2.540 4.980 14.940 4.950 2.340 1.300	Min. Max. 4.470 4.670 0.000 0.150 1.120 1.420 0.710 0.910 1.170 1.370 0.310 0.530 1.170 1.370 10.010 10.310 8.500 8.900 2.540 TYP. 4.980 5.180 14.940 4.950 5.450 2.340 2.740 1.300 1.700	Min. Max. Min. 4.470 4.670 0.176 0.000 0.150 0.000 1.120 1.420 0.044 0.710 0.910 0.028 1.170 1.370 0.046 0.310 0.530 0.012 1.170 1.370 0.046 10.010 10.310 0.394 8.500 8.900 0.335 2.540 TYP. 0.196 4.980 5.180 0.196 14.940 15.500 0.588 4.950 5.450 0.195 2.340 2.740 0.092 1.300 1.700 0.051

TO-263-2L Suggested Pad Layout



Note:

- Controlling dimension: in millimeters.
- 2. General tolerance:0.5mm.
- 3. The pad layout is for reference purposes only.

NOTICE

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Date of change	Rev#	revise content
2022/11/15	A/0	