

**TO-252 Silicon N-Channel Power MOSFET****CCMC03N120** N-Channel MOSFET

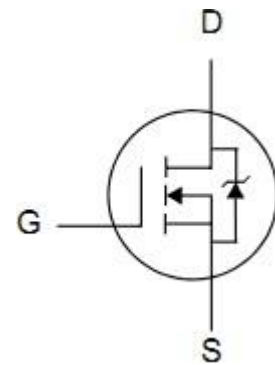
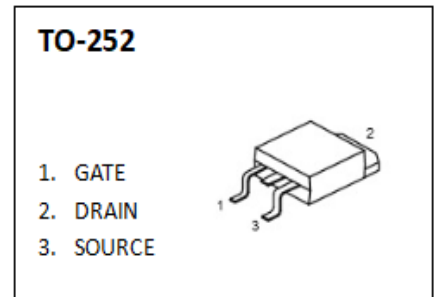
VDSS	R _{DS(ON)} (Typ.)	I _D
1200V	6.7Ω	3A

Applications:

- Adaptor
- Electric welder
- SMPS

Features:

- RoHS Compliant
- Low ON Resistance
- Low Gate Charge
- Peak Current vs Pulse Width Curve
- Inductive Switching Curves
- AEC Q101 Qualified

**Ordering Information**

PART NUMBER	PACKAGE
CCMC03N120	TO-252

Absolute Maximum Ratings $T_j=25^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter	Rating	Units
VDSS	Drain-to-Source Voltage	1200	V
I _D	Continuous Drain Current $T_c = 25^{\circ}\text{C}$	3	A
	Continuous Drain Current $T_c = 100^{\circ}\text{C}$	1.8	A
IDM	Pulsed Drain Current (NOTE *1)	12	A
P _D	Power Dissipation $T_c = 25^{\circ}\text{C}$	83	W
	Derating Factor above 25°C	0.8	W/°C
VGS	Gate-to-Source Voltage	±30	V
EAS	Single Pulse Avalanche Energy (NOTE *2)	30	mJ
dv/dt	Peak Diode Recovery dv/dt (NOTE *3)	5	V/ns
T _J and T _{STG}	Operating Junction and Storage Temperature Range	175, -55 to 175	°C

Thermal Resistance

Symbol	Parameter	Max.	Units	Test Conditions
R _{θJC}	Junction-to-Case	1.5	°C/W	Water cooled heatsink, P _D adjusted for a peak junction temperature of +150°C.
R _{θJA}	Junction-to-Ambient	120		1 cubic foot chamber, free air.

MOSFET ELECTRICAL CHARACTERISTICS

OFF Characteristics $T_J=25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BVDSS	Drain-to-Source Breakdown Voltage	1200	--	--	V	$V_{GS}=0V, I_D=250\mu A$
IDSS	Drain-to-Source Leakage Current	--	--	25	μA	$V_{DS}=1200V, V_{GS}=0V$ $T_J=25^\circ\text{C}$
		--	--	250		$V_{DS}=960V, V_{GS}=0V$ $T_J=125^\circ\text{C}$
IGSS	Gate-to-Source Forward Leakage	--	--	+100	nA	$V_{GS}=+30V$
	Gate-to-Source Reverse Leakage	--	--	-100		$V_{GS}=-30V$

ON Characteristics $T_J=25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
RDS(ON)	Static Drain-to-Source On-Resistance	--	6.7	9	Ω	$V_{GS}=10V, I_D=1.5A$
VGS(TH)	Gate Threshold Voltage	3	--	5	V	$V_{DS}=V_{GS}, I_D=250\mu A$
gfs	Forward Transconductance	--	5	--	S	$V_{DS}=15V, I_D=1.5A$
Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$						

Dynamic Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Rg	Gate resistance	--	2.2	--	Ω	$f = 1.0\text{MHz}$
Ciss	Input Capacitance	--	1006	--	μF	$V_{GS} = 0V, V_{DS} = 25V$ $f = 1.0\text{MHz}$
Coss	Output Capacitance	--	59.8	--		
Crss	Reverse Transfer Capacitance	--	2.2	--		
Qg	Total Gate Charge	--	19.7	--	nC	$I_D=3A, V_{DD}=960V$ $V_{GS} = 10V$
Qgs	Gate-to-Source Charge	--	7.5	--		
Qgd	Gate-to-Drain ("Miller") Charge	--	5.4	--		

Resistive Switching Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
td(ON)	Turn-on Delay Time	--	15.1	--	ns	$V_{DD}=600V, I_D=3A,$ $V_{GS}=10V, R_G=10\Omega$
trise	Rise Time	--	19.4	--		
td(OFF)	Turn-Off Delay Time	--	25.6	--		
tfall	Fall Time	--	76.2	--		

Source-Drain Diode CharacteristicsT_j=25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
I _S	Continuous Source Current (Body Diode)	--	--	3	A	T _C =25°C
I _{SM}	Maximum Pulsed Current (Body Diode)	--	--	12	A	
V _{SD}	Diode Forward Voltage	--	--	1.5	V	I _{SD} =3A, V _{GS} =0V
t _{rr}	Reverse Recovery Time	--	526	--	ns	I _F = I _S di/dt=100A/us
Q _{rr}	Reverse Recovery Charge	--	2000	--	nC	
Pulse width ≤300μs; duty cycle ≤ 2%						

Notes:

- *1. Repetitive rating; pulse width limited by maximum junction temperature.
- *2. L=10mH, I_D=2.5A, Start T_J=25°C
- *3. I_{SD} =3A, di/dt ≤100A/us, V_{DD}≤BV_{DS}, Start T_J=25°C
- *4. Recommend soldering temperature defined by IPC/JEDEC J-STD 020

Characteristics Curve:

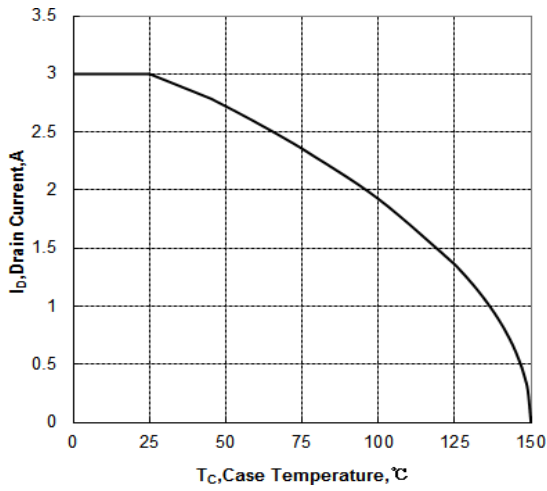


Figure 1 Maximum Continuous Drain Current vs Case Temperature

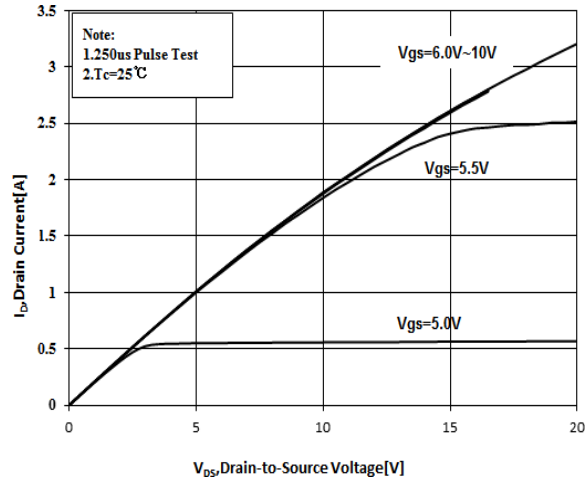


Figure 2 Typical Output Characteristics

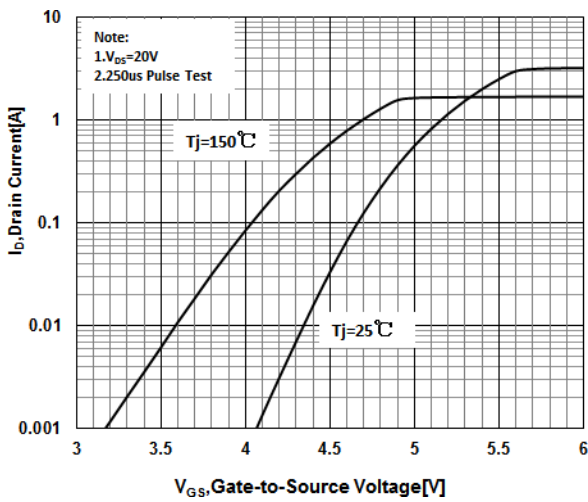


Figure 3 Typical Transfer Characteristics

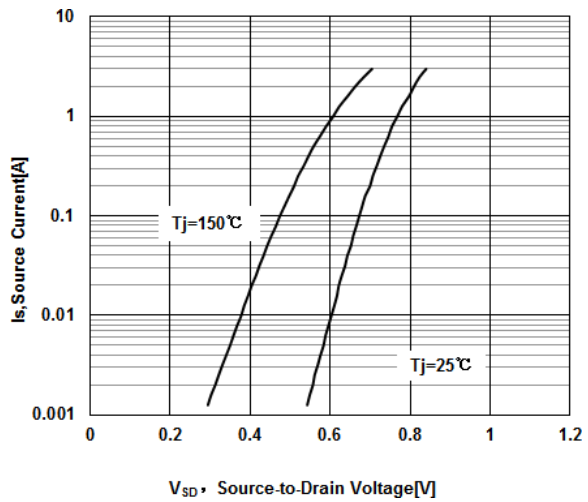


Figure 4 Typical Body Diode Transfer Characteristics

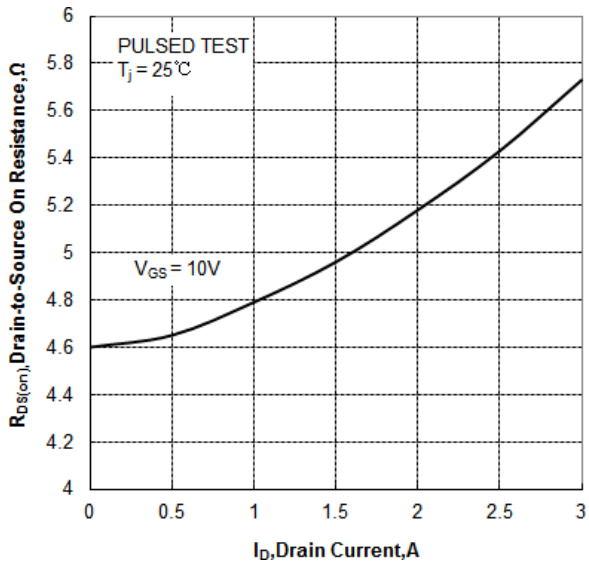


Figure 5 Typical Drain to Source ON Resistance vs Drain Current

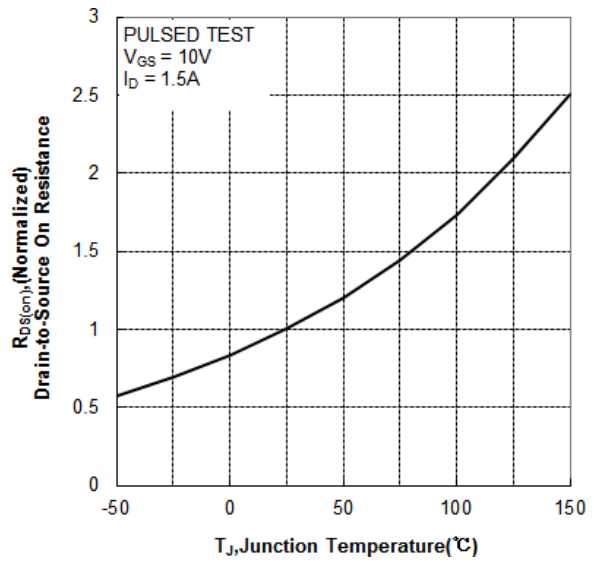


Figure 6 Typical Drain to Source on Resistance vs Junction Temperature

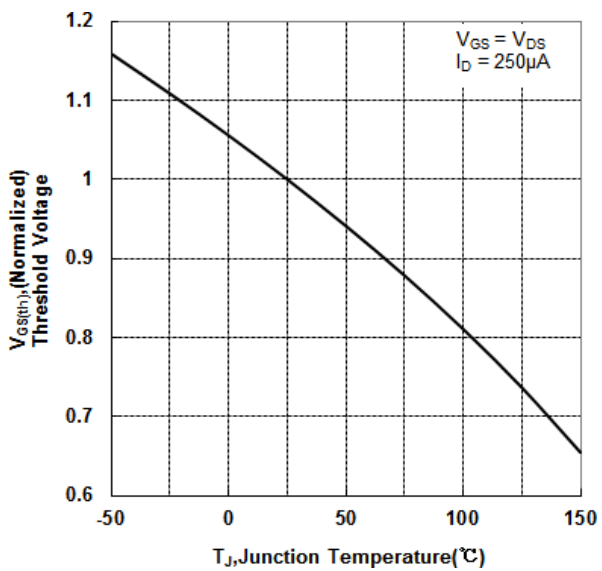


Figure 7 Typical Threshold Voltage vs Junction Temperature

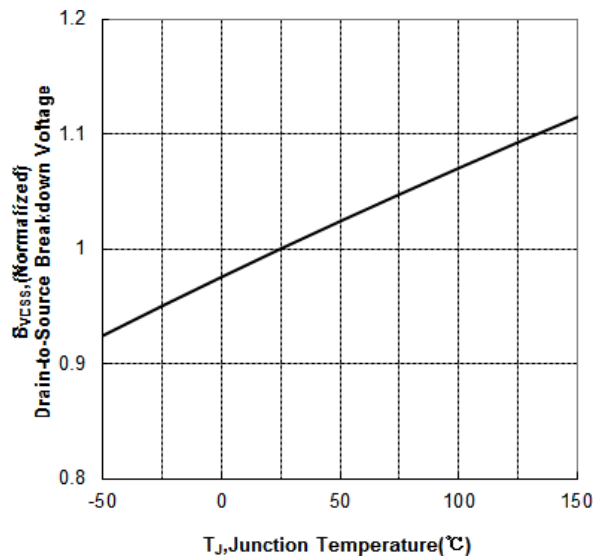


Figure 8 Typical Breakdown Voltage vs Junction Temperature

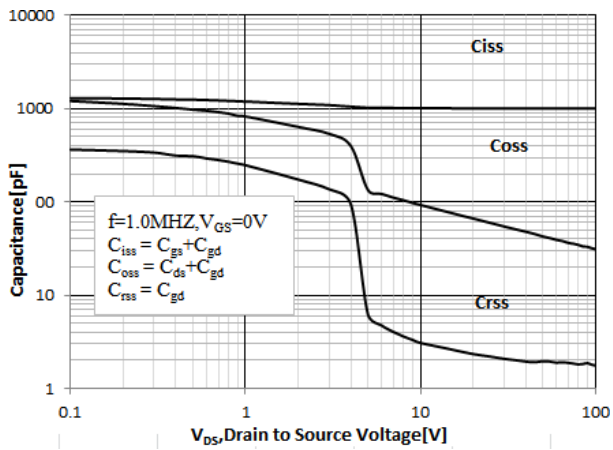


Figure 9 Typical Capacitance vs Drain to Source Voltage

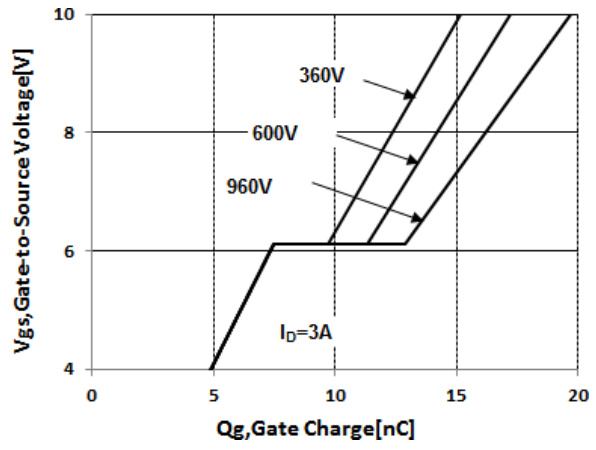
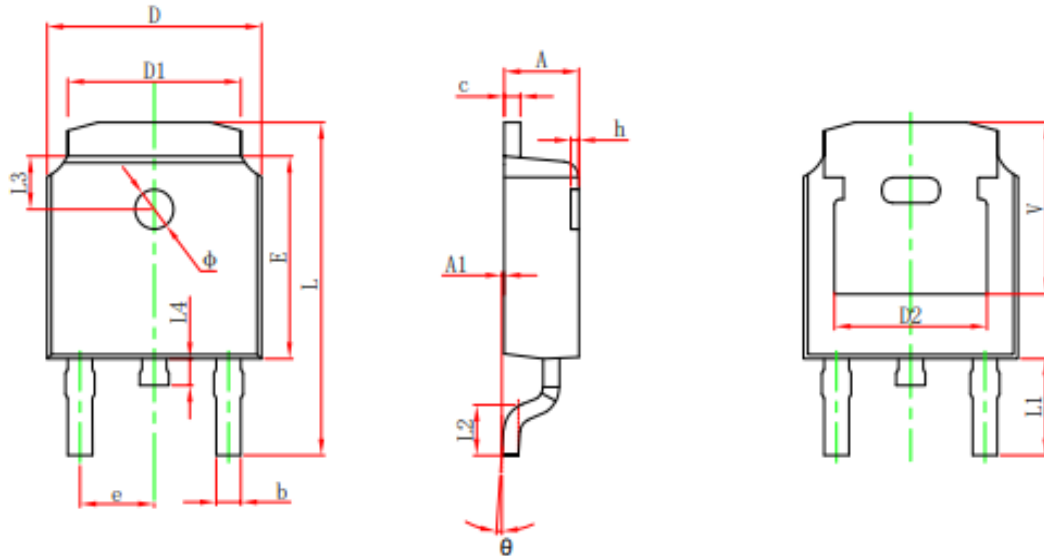


Figure 10 Typical Gate Charge vs Gate to Source Voltage

TO-252 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.635	0.770	0.025	0.030
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.712	10.312	0.382	0.406
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.250 REF.		0.207 REF.	

NOTICE

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