

## 1.3 to 3W DC-DC Converters

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Industrial



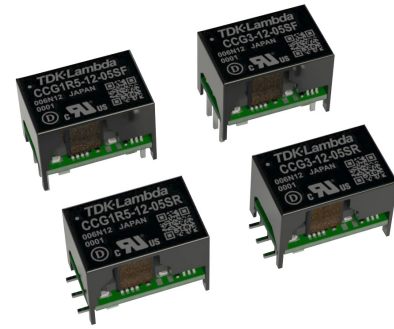
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The space saving CCG1R5 and CCG3 series of isolated DC-DC converters operate from wide range 4.5 to 18V, 9 to 36Vdc or 18 to 76V inputs with 1.5W and 3W power levels and output voltages from 3.3V to 30V (1). Single output models can be adjusted -5% to +10% by using the trim terminal. The CCG can operate in ambient temperatures of -40 to 100°C and have an input to output isolation of 1,500Vdc. Both through hole and surface mount packages are offered.

Features	Benefits
• Wide 4:1 Input Ranges	• Supports Dual 5/12V 12/24V or 24/48V System Voltages
• Space Saving Package Sizes	• Less Board Area Needed
• Certified to IEC 62368-1	• Easier System Compliance
• Reduced Derating at High Ambient Temperatures	• More Useable Power
• No Silicone Potting	• Reduced Quality Risk During Surface Mount Reflow Process

### Part Numbering Scheme

CCG	1R5	-12	-03	S	F
Series Name CCG	Output Power 1R5 = 1.5W 3 = 3W	Input Voltage 12 = 4.5 - 18V 24 = 9 - 36V 48 = 18 - 76V	Output Voltage 03 = 3.3V 05 = 5V 12 = 12V 15 = 15V	S = Single Output D = Dual Output	Mounting Type F = Through hole R = Surface Mount C = Pcb Coating

<b>Model Selector</b>								
Model Letter "x" indicates mounting type x=F through hole, x=R surface mount	Input Voltage (V)	Output Voltage (V)	Output Current (A)	Maximum Power (W)	Input Current at nominal input (A)	Efficiency (%) (100% load, nominal input)	Line / Load Regulation (mV)	
CCG1R5-12-03Sx	4.5 - 18	3.3	0.4	1.32	0.149	74	20 / 20	
CCG3-12-03Sx		3.3	0.8	2.64	0.286	78	20 / 20	
CCG1R5-12-05Sx		5	0.3	1.5	0.158	79	20 / 20	
CCG3-12-05Sx		5	0.6	3	0.313	81	20 / 20	
CCG1R5-12-12Sx		12	0.13	1.56	0.165	79	48 / 48	
CCG3-12-12Sx		12	0.25	3	0.301	83	48 / 48	
CCG1R5-12-15Sx		15	0.1	1.5	0.158	79	60 / 60	
CCG3-12-15Sx		15	0.2	3	0.301	85	60 / 60	
CCG1R5-12-12Dx (1)		24	0.065	1.56	0.167	78	120 / 240	
CCG3-12-12Dx (1)		24	0.13	3.12	0.317	84	120 / 240	
CCG1R5-12-15Dx (1)		30	0.05	1.5	0.16	78	150 / 300	
CCG3-12-15Dx (1)		30	0.1	3	0.305	84	150 / 300	
CCG1R5-12-12Dx		±12	±0.065	1.56	0.167	78	60 / 120	
CCG3-12-12Dx		±12	±0.13	3.12	0.317	84	60 / 120	
CCG1R5-12-15Dx		±15	±0.05	1.5	0.16	78	75 / 150	
CCG3-12-15Dx		±15	±0.1	3	0.305	84	75 / 150	
CCG1R5-24-03Sx		9 - 36	3.3	0.4	1.32	0.075	73	20 / 20
CCG3-24-03Sx			3.3	0.8	2.64	0.143	77	20 / 20
CCG1R5-24-05Sx	5		0.3	1.5	0.08	78	20 / 20	
CCG3-24-05Sx	5		0.6	3	0.158	82	20 / 20	
CCG1R5-24-12Sx	12		0.13	1.56	0.079	82	48 / 48	
CCG3-24-12Sx	12		0.25	3	0.151	83	48 / 48	
CCG1R5-24-15Sx	15		0.1	1.5	0.076	82	60 / 60	
CCG3-24-15Sx	15		0.2	3	0.151	84	60 / 60	
CCG1R5-24-12Dx (1)	24		0.065	1.56	0.081	81	120 / 240	
CCG3-24-12Dx (1)	24		0.13	3.12	0.159	83	120 / 240	
CCG1R5-24-15Dx (1)	30		0.05	1.5	0.079	80	150 / 300	
CCG3-24-15Dx (1)	30		0.1	3	0.152	82	150 / 300	
CCG1R5-24-12Dx	±12		±0.065	1.56	0.081	81	60 / 120	
CCG3-24-12Dx	±12		±0.13	3.12	0.159	83	60 / 120	
CCG1R5-24-15Dx	±15		±0.05	1.5	0.079	80	75 / 150	
CCG3-24-15Dx	±15		±0.1	3	0.152	82	75 / 150	
CCG1R5-48-03Sx	18 - 76		3.3	0.4	1.32	0.039	72	20 / 20
CCG3-48-03Sx			3.3	0.8	2.64	0.071	77	20 / 20
CCG1R5-48-05Sx		5	0.3	1.5	0.041	76	20 / 20	
CCG3-48-05Sx		5	0.6	3	0.078	80	20 / 20	
CCG1R5-48-12Sx		12	0.13	1.56	0.042	79	48 / 48	
CCG3-48-12Sx		12	0.25	3	0.076	82	48 / 48	
CCG1R5-48-15Sx		15	0.1	1.5	0.041	77	60 / 60	
CCG3-48-15Sx		15	0.2	3	0.076	83	60 / 60	
CCG1R5-48-12Dx (1)		24	0.065	1.56	0.042	81	120 / 240	
CCG3-48-12Dx (1)		24	0.13	3.12	0.08	83	120 / 240	
CCG1R5-48-15Dx (1)		30	0.05	1.5	0.041	80	150 / 300	
CCG3-48-15Dx (1)		30	0.1	3	0.077	82	150 / 300	
CCG1R5-48-12Dx		±12	±0.065	1.56	0.042	78	60 / 120	
CCG3-48-12Dx		±12	±0.13	3.12	0.08	83	60 / 120	
CCG1R5-48-15Dx		±15	±0.05	1.5	0.041	76	75 / 150	
CCG3-48-15Dx		±15	±0.1	3	0.077	83	75 / 150	

Notes  
 (1) ±12V dual output models can provide a 24V single output by utilizing just the +Vout and -Vout pins, leaving the COM unconnected. Similarly ±15V dual output models can be used as a 30V single output.

Specifications		
Model		CCG1R5-10, CCG3
<b>Input</b>		
Input Voltage Range	Vdc	See model selector table
No Load Power Consumption (2)	W	CCG1R5, CCG3: 0.15 to 0.45. See evaluation data on website.
Efficiency	-	See model selector table
Conducted & Radiated EMI	-	EN55011/EN55032-A, FCC Class A, VCCI-A (External components are required, consult Evaluation Data on website)
Immunity	-	See Immunity table
Safety Certifications and Markings	-	IEC/UL/CSA/EN62368-1, CE Mark and UKCA Mark

Immunity				
Test	Standard	Test Level	Criteria	Notes: See IEC61000 immunity test report on website for external filtering circuitry
ESD	EN61000-4-2	3	B	Air ± 8kV
Radiated Susceptibility	EN61000-4-3	2/3	A	Lvl 2: 3V/m(1.4-6.0GHz) Lvl 3: 10V/m(80-1000MHz)
Electrical Fast Transient Burst	EN61000-4-4	4	B	± 4kV for input and output ± 2kV for signal pins
Surge	EN61000-4-5	3	B	Normal mode ± 2kV
Conducted Susceptibility	EN61000-4-6	3	A	10V(150kHz-80MHz)
Magnetic Fields	EN61000-4-8	4	A	30A/m(50Hz, 60Hz)

Specifications		
Model		CCG1R5-10, CCG3
<b>Output</b>		
Output Voltage Tolerance	%	±2
Output Voltage Adjustment	%	Single output only. -5, +10
Switching Frequency	kHz	CCG1R5, CCG3: 400 (fixed)
Cross Regulation	mV	Dual output only. ±12V: 480, ±15V: 600 (Asymmetrical, one output at 20%, the other at 100%)
External Load Capacitance (Maximum)	uF	CCG1R5, CCG3: 3.3-5V: 220, 12-15V: 100
Ripple & Noise	mV	200
Temperature Coefficient	%/°C	0.02
Minimum Load	-	No minimum load required
Overcurrent Protection	%	Hiccup mode. >105%
Overvoltage Protection	-	-
Overtemperature Protection	-	-
Remote Sense	-	No remote sense
Remote On/Off	-	Negative Logic ON: Short , OFF: Open
Parallel Operation	-	Not possible
<b>Environmental</b>		
Operating Temperature	°C	-40 to +100 (Ambient). See derating guide below and installation manual.
Maximum Transformer Temperature	°C	112 to 115 (See instruction manual on website)
Storage Temperature	°C	-55 to +125
Humidity (non condensing)	%RH	5 - 95 (Operating & storage)
Cooling	-	Convection or forced air
Altitude	m	5,000
Withstand Voltage	Vac/Vdc	Input to output 1,500Vdc or 1,000Vac for 1 minute
Vibration (Non operating)	-	10-55Hz (Sweep for 1min.) Amplitude 1.65 mm Constant (Maximum 98m/s <sup>2</sup> ) X,Y,Z 1 hour each
Shock (Non operating)	-	490.3m/s <sup>2</sup> , 11ms, ±X, ±Y, ±Z 3 times each
Warranty	yrs	5

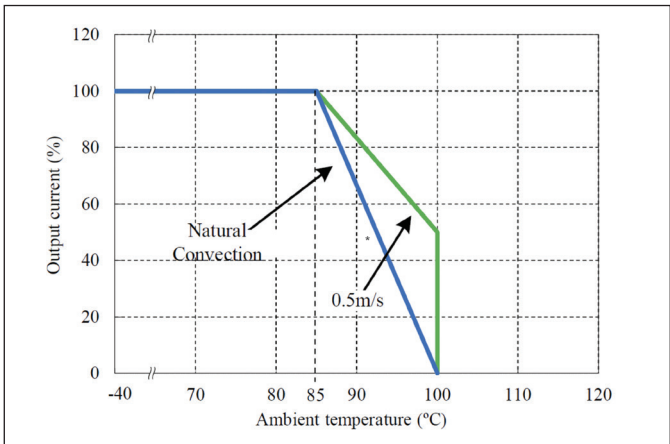
Specifications		
Model	CCG1R5-10, CCG3	
<b>Other</b>		
Weight (Typ)	g	CCG1R5: 3. CCG3: 3
Size (LxWxH)	mm	CCG1R5, CCG3: 15.7 x 10.4 x 11.5
Size (LxWxH)	Inches	CCG1R5, CCG3: 0.62 x 0.41 x 0.45
Case Material	-	Non-conductive black plastic
MTBF - MIL-HDBK-217F, Full Load, 40°C	Hours	CCG1R5 and CCG3: 8,349,094 to 11,883,918. See reliability data on the website
Warranty	yrs	5

Notes

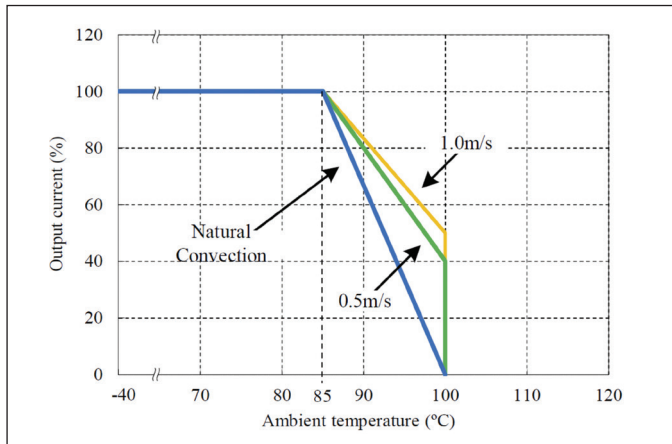
See website for detailed specifications, test methods and installation manual

(2) Off-load power consumption can be reduced using the remote on/off function - See evaluation and installation manual.

**CCG1R5 Output Current vs. Ambient Temperature (\*)**

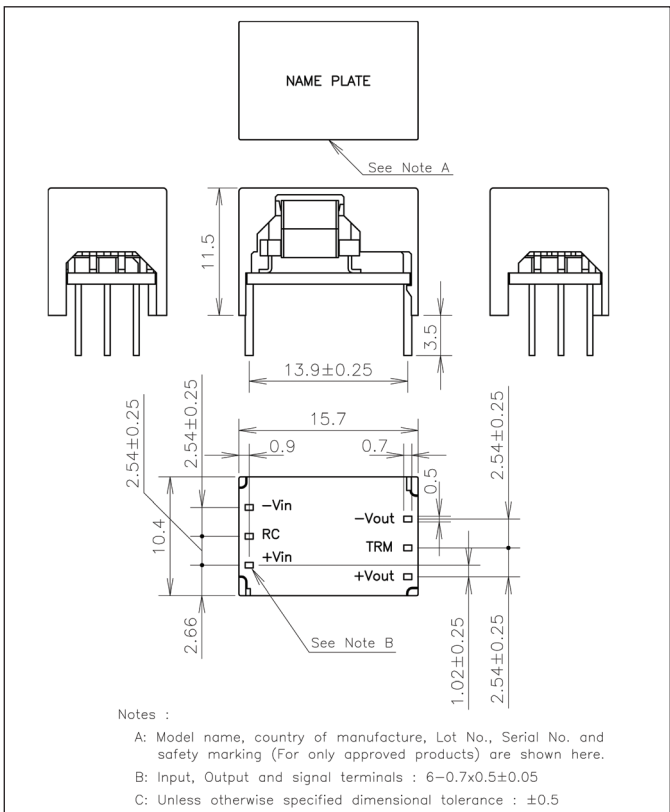


**CCG3 Output Current vs. Ambient Temperature (\*)**

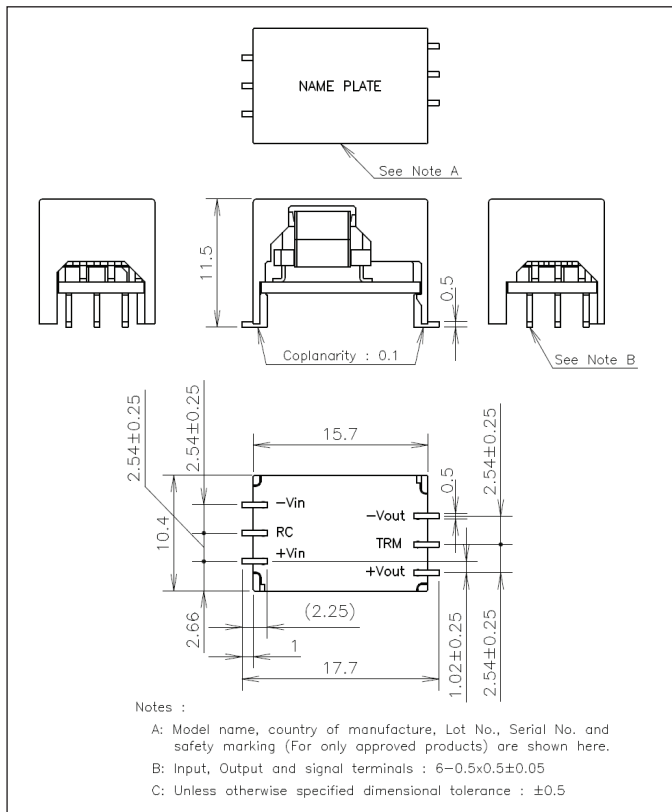


(\*) Forced air derating varies by model number, see Installation Manual.

**Outline Drawing Single Output CCG1R5 and CCG3 Through Hole (F suffix)**



**Outline Drawing Single Output CCG1R5 and CCG3 Surface Mount (R suffix)**





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