

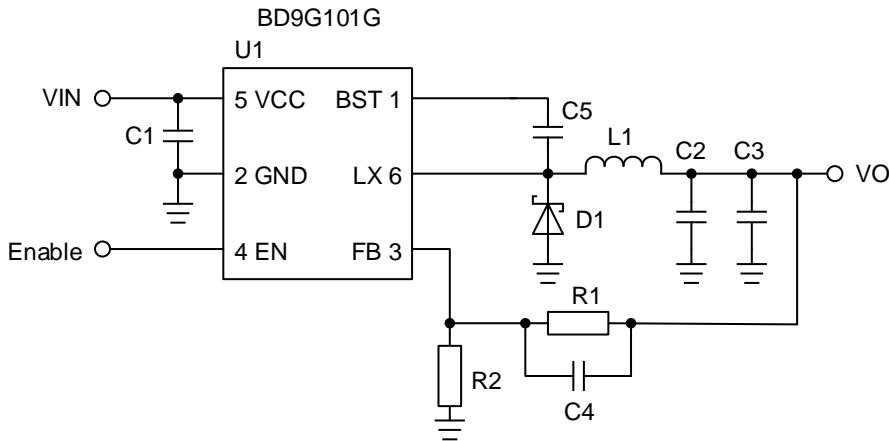
# DC/DC Converter

## Application Information

IC Product Name	BD9G101G
Topology	Buck (Step-Down) Switching Regulator
Type	Non-Isolation

	Input	Output
1	24V to 40V	3.3V, 500mA
2	20V to 30V	6.0V, 500mA
3	13V to 33V	9.0V, 500mA
4	19V to 36V	13V, 200mA
5	23V to 40V	15V, 500mA
6	35V to 42V	24V, 120mA
7	12V to 20V	-8V, 400mA
8	18V to 30V	-12V, 400mA

■ Typical Application Circuit 1



■ EN terminal setting (4-pin)

Terminal state	IC operation
2.0V to VIN	Normal operation
-0.3V to 0.8V	Power down

■ Output voltage setting

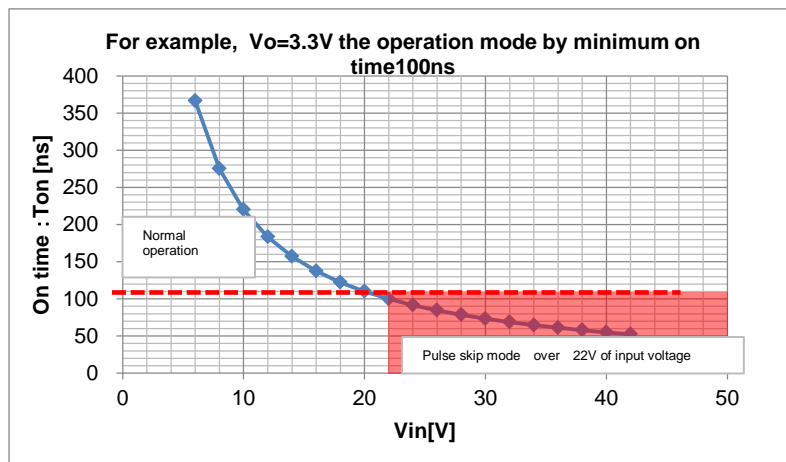
$$V_{OUT} = \frac{R_1 + R_2}{R_2} \times 0.75 [V]$$

$$R_1 + R_2 \leq V_{OUT} \times 10^3$$

Input/output voltage conditions are required to satisfy the following equations:

$$V_{OUT} = 1V \text{ to } (V_{IN} \times 0.7)V$$

The available minimum output voltage is restricted by minimum on pulse typ. 100nsec.



The available maximum output voltage is restricted by maxduty, Ron, and BST-UVLO. BST-UVLO function restricts the maximum output voltage lower than Vin - 3V.

■ Bill of Materials 1

BD9G101G BOM Rev.001  $V_{IN}=6.0V$  to  $42V$ ,  $I_O=0.5A$

October 14, 2015

1.  $V_O=3.3V$ ,  $I_O=500mA$  ( $V_{IN}=24V$  to  $40V$ )

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	4.7 $\mu$ F	50V, B, $\pm 10\%$	GRM21BB31H475KE51	MURATA	2012
2	C2, C3	Ceramic Capacitor	47 $\mu$ F	10V, X5R, $\pm 20\%$	GRM21BR61A476ME15	MURATA	2012
1	C4	Ceramic Capacitor	0.1 $\mu$ F	25V, B, $\pm 10\%$	GRM155B31E104KA87	MURATA	1005
1	C5	Ceramic Capacitor	0.015 $\mu$ F	50V, B, $\pm 10\%$	GRM188B11H153KA01	MURATA	1608
1	D1	Schottky Barrier Diode	-	VR=60V, $I_O=1A$	RB160L-60	ROHM	5026
1	L1	Inductor	4.7 $\mu$ H	$\pm 20\%$ , DCR=57.4m $\Omega$ max, 2.7A	XFL4020-472ME	Coilcraft	4040
				$\pm 20\%$ , DCR=96.6m $\Omega$ max, 1.7A	LQH44PN4R7MP0	Murata	4040
				$\pm 30\%$ , DCR=186m $\Omega$ max, 1.6A	LQH32PN4R7NNC	Murata	3225
				$\pm 20\%$ , DCR=63m $\Omega$ max, 1.65A	CDRH40D28NP-4R7NC	Sumida	4040
				$\pm 20\%$ , DCR=84m $\Omega$ max, 2.0A	NRS4018T4R7MDGJV	TAIYO YUDEN	4040
				$\pm 20\%$ , DCR=210m $\Omega$ max, 1.1A	VLS252012CX-4R5M	TDK	2520
				$\pm 20\%$ , DCR=126m $\Omega$ max, 1.1A	1229AS-H-4R7N=P3 (DEM3512C)	TOKO	3739
				$\pm 20\%$ , DCR=105m $\Omega$ max, 1.75A	IHLP1616BZER4R7M1A	VISHAY	4541
				$\pm 20\%$ , DCR=120m $\Omega$ max, 1.7A	744025004 (WE-TPC SMD)	WÜRTH	2828
1	R1	Resistor	1.6k $\Omega$	0.063W, 50V, 1%	MCR01MZPF1601	ROHM	1005
1	R2	Resistor	470 $\Omega$	0.063W, 50V, 1%	MCR01MZPF4700	ROHM	1005
1	U1	IC	-	Buck DC/DC Converter	BD9G101G	ROHM	SSOP6

2.  $V_O=6.0V$ ,  $I_O=500mA$  ( $V_{IN}=20V$  to  $30V$ )

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	4.7 $\mu$ F	50V, B, $\pm 10\%$	GRM32EB31H475KA87	MURATA	3225
1	C2	Ceramic Capacitor	22 $\mu$ F	25V, B, $\pm 20\%$	GRM32EB31E226ME15	MURATA	3225
0	C3	-	n/a	-	-	-	-
1	C4	Ceramic Capacitor	0.22 $\mu$ F	25V, B, $\pm 10\%$	GRM188B31E224KA87	MURATA	1608
1	C5	Ceramic Capacitor	0.015 $\mu$ F	50V, B, $\pm 10\%$	GRM188B11H153KA01	MURATA	1608
1	D1	Schottky Barrier Diode	-	VR=60V, $I_O=1A$	RB162L-60	ROHM	5026
1	L1	Inductor	6.8 $\mu$ H	$\pm 20\%$ , DCR=150m $\Omega$ max, 1.3A	LPS4018-682MR	Coilcraft	4040
				$\pm 20\%$ , DCR=186m $\Omega$ max, 0.83A	LQH3NPN6R8MMR	Murata	3030
				$\pm 20\%$ , DCR=470m $\Omega$ max, 0.83A	LQH2HPN6R8MGR	Murata	2520
				$\pm 25\%$ , DCR=136m $\Omega$ max, 1.52A	CDRH3D23HPNP-6R8PC	Sumida	3838
				$\pm 20\%$ , DCR=117.6m $\Omega$ max, 1.6A	NRS4018T6R8MDGJ	TAIYO YUDEN	4040
				$\pm 20\%$ , DCR=192m $\Omega$ max, 0.87A	NRS3015T6R8MNGH	TAIYO YUDEN	3030
				$\pm 20\%$ , DCR=156m $\Omega$ max, 1.0A	VLS4012ET-6R8M	TDK	4040
				$\pm 20\%$ , DCR=106m $\Omega$ max, 1.7A	1235AS-H-6R8M=P3 (DEM4518C)	TOKO	4745
				$\pm 20\%$ , DCR=115m $\Omega$ max, 1.5A	IFSC1515AHER6R8M01	VISHAY	3838
				$\pm 20\%$ , DCR=165m $\Omega$ max, 1.3A	744025006 (WE-TPC SMD)	WÜRTH	2828
1	R1	Resistor	2.4k $\Omega$	R1=2.4k $\Omega$ +120 $\Omega$ 0.063W, 50V, 1%	MCR01MZPF2401	ROHM	1005
1		Resistor	120 $\Omega$		MCR01MZPF1200	ROHM	1005
1	R2	Resistor	360 $\Omega$	0.063W, 50V, 1%	MCR01MZPF3600	ROHM	1005
1	U1	IC	-	Buck DC/DC Converter	BD9G101G	ROHM	SSOP6

■ Bill of Materials 1 (continued)

3.  $V_O=9.0V$ ,  $I_O=500mA$  ( $V_{IN}=13V$  to 33V)

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	4.7 $\mu$ F	50V, B, $\pm 10\%$	GRM31CB31H475KA12	MURATA	3216
1	C2	Ceramic Capacitor	22 $\mu$ F	16V, B, $\pm 20\%$	GRM32EB31C226ME16	MURATA	3225
0	C3	-	n/a	-	-	-	-
1	C4	Ceramic Capacitor	0.22 $\mu$ F	25V, B, $\pm 10\%$	GRM188B31E224KA87	MURATA	1608
1	C5	Ceramic Capacitor	0.015 $\mu$ F	50V, B, $\pm 10\%$	GRM188B11H153KA01	MURATA	1608
1	D1	Schottky Barrier Diode	-	VR=60V, $I_O=1A$	RB162L-60	ROHM	5026
1	L1	Inductor	15 $\mu$ H	$\pm 20\%$ , DCR=260m $\Omega$ max, 0.94A	LPS4018-153MR	Coilcraft	4040
				$\pm 20\%$ , DCR=96m $\Omega$ max, 1.8A	LQH5BPN150M38	Murata	4949
				$\pm 20\%$ , DCR=133m $\Omega$ max, 3.6A	CDMC50D38T150NP-150MC	Sumida	5450
				$\pm 20\%$ , DCR=104m $\Omega$ max, 2A	NRS5040T150MMGJV	TAIYO YUDEN	4949
				$\pm 20\%$ , DCR=98m $\Omega$ max, 3.1A	VL56045EX-150M	TDK	6060
				$\pm 20\%$ , DCR=142m $\Omega$ max, 1.05A	#A915AY-150M=P3 (D53LC)	TOKO	5050
				$\pm 20\%$ , DCR=208m $\Omega$ max, 1.6A	IHLP2020CZER150M5A	VISHAY	5552
			$\pm 20\%$ , DCR=136.2m $\Omega$ max, 1.7A	74408943150 (WE-SPC SMD)	WÜRTH	4848	
1	R1	Resistor	3.3k $\Omega$	0.063W, 50V, 1%	MCR01MZPF3301	ROHM	1005
1	R2	Resistor	300 $\Omega$	0.063W, 50V, 1%	MCR01MZPF3000	ROHM	1005
1	U1	IC	-	Buck DC/DC Converter	BD9G101G	ROHM	SSOP6

4.  $V_O=13V$ ,  $I_O=200mA$  ( $V_{IN}=19V$  to 36V)

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	4.7 $\mu$ F	50V, B, $\pm 10\%$	GRM32EB31H475KA87	MURATA	3225
1	C2	Ceramic Capacitor	22 $\mu$ F	25V, B, $\pm 10\%$	GRM32EB31E226KE15	MURATA	3225
0	C3	-	n/a	-	-	-	-
1	C4	Ceramic Capacitor	0.1 $\mu$ F	25V, B, $\pm 10\%$	GRM155B31E104KA87	MURATA	1005
1	C5	Ceramic Capacitor	0.015 $\mu$ F	50V, B, $\pm 10\%$	GRM188B11H153KA01	MURATA	1608
1	D1	Schottky Barrier Diode	-	VR=60V, $I_O=1A$	RB162L-60	ROHM	5026
1	L1	Inductor	6.8 $\mu$ H	$\pm 20\%$ , DCR=150m $\Omega$ max, 1.3A	LPS4018-682MR	Coilcraft	4040
				$\pm 20\%$ , DCR=186m $\Omega$ max, 0.83A	LQH3NPN6R8MMR	Murata	3030
				$\pm 20\%$ , DCR=470m $\Omega$ max, 0.83A	LQH2HPN6R8MGR	Murata	2520
				$\pm 25\%$ , DCR=136m $\Omega$ max, 1.52A	CDRH3D23HPNP-6R8PC	Sumida	3838
				$\pm 20\%$ , DCR=117.6m $\Omega$ max, 1.6A	NRS4018T6R8MDGJ	TAIYO YUDEN	4040
				$\pm 20\%$ , DCR=192m $\Omega$ max, 0.87A	NRS3015T6R8MNGH	TAIYO YUDEN	3030
				$\pm 20\%$ , DCR=156m $\Omega$ max, 1.0A	VL54012ET-6R8M	TDK	4040
				$\pm 20\%$ , DCR=106m $\Omega$ max, 1.7A	1235AS-H-6R8M=P3 (DEM4518C)	TOKO	4745
				$\pm 20\%$ , DCR=115m $\Omega$ max, 1.5A	IFSC1515AHER6R8M01	VISHAY	3838
			$\pm 20\%$ , DCR=165m $\Omega$ max, 1.3A	744025006 (WE-TPC SMD)	WÜRTH	2828	
1	R1	Resistor	3.6k $\Omega$	0.063W, 50V, 1%	MCR01MZPF3601	ROHM	1005
1	R2	Resistor	220 $\Omega$	0.063W, 50V, 1%	MCR01MZPF2200	ROHM	1005
1	U1	IC	-	Buck DC/DC Converter	BD9G101G	ROHM	SSOP6

■ Bill of Materials 1 (continued)

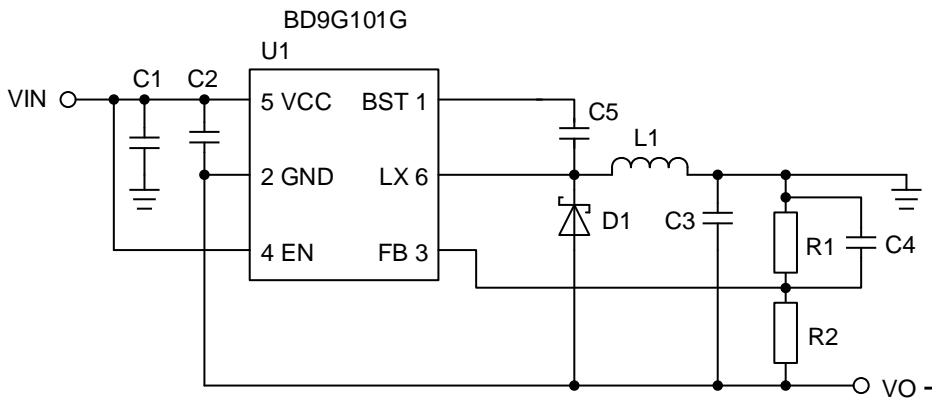
5.  $V_O=15V$ ,  $I_O=500mA$  ( $V_{IN}=23V$  to  $40V$ )

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	4.7 $\mu$ F	50V, B, $\pm$ 10%	GRM31CB31H475KA12	MURATA	3216
1	C2	Ceramic Capacitor	22 $\mu$ F	25V, B, $\pm$ 20%	GRM32EB31E226ME15	MURATA	3225
0	C3	-	n/a	-	-	-	-
1	C4	Ceramic Capacitor	0.1 $\mu$ F	25V, B, $\pm$ 10%	GRM155B31E104KA87	MURATA	1005
1	C5	Ceramic Capacitor	0.015 $\mu$ F	50V, B, $\pm$ 10%	GRM188B11H153KA01	MURATA	1608
1	D1	Schottky Barrier Diode	-	VR=60V, $I_O=1A$	RB162L-60	ROHM	5026
1	L1	Inductor	10 $\mu$ H	$\pm$ 20%, DCR=200m $\Omega$ max, 1.3A	LPS4018-103MR	Coilcraft	4040
				$\pm$ 20%, DCR=354m $\Omega$ max, 1.0A	LQH32PB100MNC	Murata	3225
				$\pm$ 20%, DCR=252m $\Omega$ max, 0.59A	LQH3NPN100MMR	Murata	3030
				$\pm$ 20%, DCR=672m $\Omega$ max, 0.7A	LQH2HPN100MGR	Murata	2520
				$\pm$ 20%, DCR=198m $\Omega$ max, 1.28A	CDRH3D23HPNP-100MC	Sumida	3838
				$\pm$ 20%, DCR=180m $\Omega$ max, 1.3A	NRS4018T100MDGJ	TAIYO YUDEN	4040
				$\pm$ 20%, DCR=228m $\Omega$ max, 0.89A	VLS4012ET-100M	TDK	4040
				$\pm$ 20%, DCR=132m $\Omega$ max, 1.3A	1235AS-H-100M=P3 (DEM4518C)	TOKO	4745
				$\pm$ 20%, DCR=135m $\Omega$ max, 1.3A	IFSC1515AHER100M01	VISHAY	3838
				$\pm$ 20%, DCR=148m $\Omega$ max, 2.1A	74408942100 (WE-SPC SMD)	WÜRTH	4848
1	R1	Resistor	8.2k $\Omega$	0.063W, 50V, 1%	MCR01MZPF8201	ROHM	1005
1	R2	Resistor	430 $\Omega$	0.063W, 50V, 1%	MCR01MZPF4300	ROHM	1005
1	U1	IC	-	Buck DC/DC Converter	BD9G101G	ROHM	SSOP6

6.  $V_O=24V$ ,  $I_O=120mA$  ( $V_{IN}=35V$  to  $42V$ )

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	4.7 $\mu$ F	50V, B, $\pm$ 10%	GRM32EB31H475KA87	MURATA	3225
1	C2	Ceramic Capacitor	10 $\mu$ F	50V, B, $\pm$ 10%	GRM32EB31H106KA12	MURATA	3225
0	C3	-	n/a	-	-	-	-
1	C4	Ceramic Capacitor	0.047 $\mu$ F	50V, B, $\pm$ 10%	GRM188B11H473KA61	MURATA	1608
1	C5	Ceramic Capacitor	0.015 $\mu$ F	50V, B, $\pm$ 10%	GRM188B11H153KA01	MURATA	1608
1	D1	Schottky Barrier Diode	-	VR=60V, $I_O=1A$	RB160M-60	ROHM	3516
1	L1	Inductor	10 $\mu$ H	$\pm$ 20%, DCR=200m $\Omega$ max, 1.3A	LPS4018-103MR	Coilcraft	4040
				$\pm$ 20%, DCR=354m $\Omega$ max, 1.0A	LQH32PB100MNC	Murata	3225
				$\pm$ 20%, DCR=252m $\Omega$ max, 0.59A	LQH3NPN100MMR	Murata	3030
				$\pm$ 20%, DCR=672m $\Omega$ max, 0.7A	LQH2HPN100MGR	Murata	2520
				$\pm$ 20%, DCR=198m $\Omega$ max, 1.28A	CDRH3D23HPNP-100MC	Sumida	3838
				$\pm$ 20%, DCR=180m $\Omega$ max, 1.3A	NRS4018T100MDGJ	TAIYO YUDEN	4040
				$\pm$ 20%, DCR=228m $\Omega$ max, 0.89A	VLS4012ET-100M	TDK	4040
				$\pm$ 20%, DCR=132m $\Omega$ max, 1.3A	1235AS-H-100M=P3 (DEM4518C)	TOKO	4745
				$\pm$ 20%, DCR=135m $\Omega$ max, 1.3A	IFSC1515AHER100M01	VISHAY	3838
				$\pm$ 20%, DCR=148m $\Omega$ max, 2.1A	74408942100 (WE-SPC SMD)	WÜRTH	4848
1	R1	Resistor	22k $\Omega$	R1=22k $\Omega$ +1.2k $\Omega$	MCR01MZPF2202	ROHM	1005
Resistor		1.2k $\Omega$	0.063W, 50V, 1%	MCR01MZPF1201	ROHM	1005	
1	R2	Resistor	750 $\Omega$	0.063W, 50V, 1%	MCR01MZPF7500	ROHM	1005
1	U1	IC	-	Buck DC/DC Converter	BD9G101G	ROHM	SSOP6

■ Typical Application Circuit 2



■ Output voltage setting

$$V_{OUT} = -\frac{R_1 + R_2}{R_2} \times 0.75 [V]$$

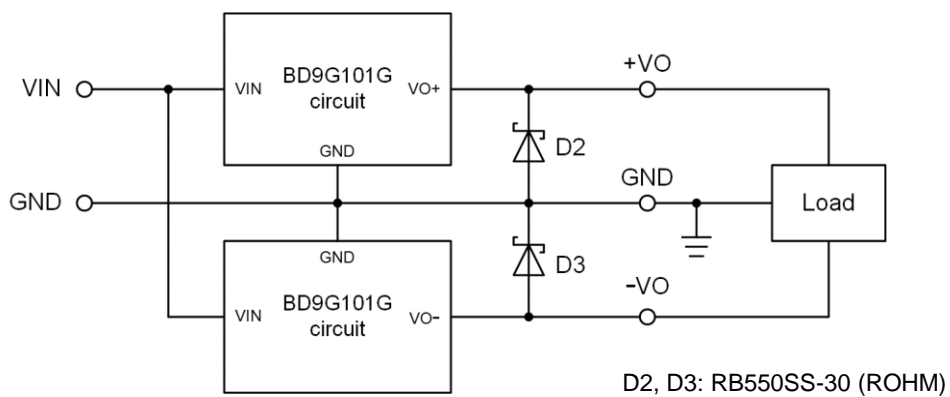
$$R_1 + R_2 \leq V_{OUT} \times 10^3$$

Input/output voltage conditions are required to satisfy the following equations:

$$V_{OUT} = -(V_{IN} \times 0.7)V \text{ to } -(V_{IN} \times 0.15)V$$

$$-(V_{IN} \times 0.15) \leq -1.0V$$

$$(V_{IN} - V_{OUT}) \leq 42V$$



If you want to use in the positive and negative power supply, Schottky barrier diode D2 and D3 is absolutely necessary. If not used, there is a possibility that the power of one side dose not rise by latching down when the power is rising.

■ Bill of Materials 2

7.  $V_O = -8.0V$ ,  $I_O = 400mA$  ( $V_{IN} = 12V$  to  $20V$ )

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
2	C1, C2	Ceramic Capacitor	4.7 $\mu$ F	50V, B, $\pm 10\%$	GRM32EB31H475KA87	MURATA	3225
1	C3	Ceramic Capacitor	10 $\mu$ F	50V, B, $\pm 10\%$	GRM32EB31H106KA12	MURATA	3225
1	C4	Ceramic Capacitor	0.1 $\mu$ F	25V, B, $\pm 10\%$	GRM155B31E104KA87	MURATA	1005
1	C5	Ceramic Capacitor	0.015 $\mu$ F	50V, B, $\pm 10\%$	GRM188B11H153KA01	MURATA	1608
1	D1	Schottky Barrier Diode	-	VR=60V, $I_O = 1A$	RB160M-60	ROHM	3516
1	L1	Inductor	15 $\mu$ H	$\pm 20\%$ , DCR=260m $\Omega$ max, 0.94A	LPS4018-153MR	Coilcraft	4040
				$\pm 20\%$ , DCR=96m $\Omega$ max, 1.8A	LQH5BPN150M38	Murata	4949
				$\pm 20\%$ , DCR=132m $\Omega$ max, 0.95A	CDRH58D18RNP-150MC	Sumida	6060
				$\pm 20\%$ , DCR=104m $\Omega$ max, 2A	NRS5040T150MMGJV	TAIYO YUDEN	4949
				$\pm 20\%$ , DCR=98m $\Omega$ max, 3.1A	VLS6045EX-150M	TDK	6060
				$\pm 20\%$ , DCR=142m $\Omega$ max, 1.05A	#A915AY-150M=P3 (D53LC)	TOKO	5050
				$\pm 20\%$ , DCR=208m $\Omega$ max, 1.6A	IHLP2020CZER150M5A	VISHAY	5552
			$\pm 20\%$ , DCR=136.2m $\Omega$ max, 1.7A	74408943150 (WE-SPC SMD)	WÜRTH	4848	
1	R1	Resistor	6.8k $\Omega$	R1=6.8k $\Omega$ +470 $\Omega$	MCR01MZPF6801	ROHM	1005
1		Resistor	470 $\Omega$	0.063W, 50V, 1%	MCR01MZPF4700	ROHM	1005
1	R2	Resistor	750 $\Omega$	0.063W, 50V, 1%	MCR01MZPF7500	ROHM	1005
1	U1	IC	-	Buck DC/DC Converter	BD9G101G	ROHM	SSOP6

8.  $V_O = -12V$ ,  $I_O = 400mA$  ( $V_{IN} = 18V$  to  $30V$ )

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
2	C1, C2	Ceramic Capacitor	4.7 $\mu$ F	50V, B, $\pm 10\%$	GRM32EB31H475KA87	MURATA	3225
1	C3	Ceramic Capacitor	10 $\mu$ F	50V, B, $\pm 10\%$	GRM32EB31H106KA12	MURATA	3225
1	C4	Ceramic Capacitor	0.1 $\mu$ F	25V, B, $\pm 10\%$	GRM155B31E104KA87	MURATA	1005
1	C5	Ceramic Capacitor	0.015 $\mu$ F	50V, B, $\pm 10\%$	GRM188B11H153KA01	MURATA	1005
1	D1	Schottky Barrier Diode	-	VR=60V, $I_O = 1A$	RB162L-60	ROHM	5026
1	L1	Inductor	15 $\mu$ H	$\pm 20\%$ , DCR=260m $\Omega$ max, 0.94A	LPS4018-153MR	Coilcraft	4040
				$\pm 20\%$ , DCR=96m $\Omega$ max, 1.8A	LQH5BPN150M38	Murata	4949
				$\pm 20\%$ , DCR=132m $\Omega$ max, 0.95A	CDRH58D18RNP-150MC	Sumida	6060
				$\pm 20\%$ , DCR=104m $\Omega$ max, 2A	NRS5040T150MMGJV	TAIYO YUDEN	4949
				$\pm 20\%$ , DCR=98m $\Omega$ max, 3.1A	VLS6045EX-150M	TDK	6060
				$\pm 20\%$ , DCR=142m $\Omega$ max, 1.05A	#A915AY-150M=P3 (D53LC)	TOKO	5050
				$\pm 20\%$ , DCR=208m $\Omega$ max, 1.6A	IHLP2020CZER150M5A	VISHAY	5552
			$\pm 20\%$ , DCR=136.2m $\Omega$ max, 1.7A	74408943150 (WE-SPC SMD)	WÜRTH	4848	
1	R1	Resistor	7.5k $\Omega$	R1=7.5k $\Omega$ +150 $\Omega$	MCR01MZPF7501	ROHM	1005
1		Resistor	150 $\Omega$	0.063W, 50V, 1%	MCR01MZPF1500	ROHM	1005
1	R2	Resistor	510 $\Omega$	0.063W, 50V, 1%	MCR01MZPF5100	ROHM	1005
1	U1	IC	-	Buck DC/DC Converter	BD9G101G	ROHM	SSOP6

## ■ Precautions for use

- (1) This document provides the BOM for evaluation boards. Small parts can also be selected for resistor, capacitor, and coil.
- (2) When miniaturizing a resistor, consider decrease in rated power and withstand voltage.
- (3) When miniaturizing a ceramic capacitor, consider decrease in withstand voltage. In addition, the capacity may be decreased by DC bias characteristics, and the desired characteristics may not be obtained.
- (4) If ceramic capacitor models differ even when they have the same capacity and withstand voltage, the capacity may be decreased by DC bias characteristics depending on the model, and desired characteristics may not be obtained. Be sure to check the DC bias characteristics.
- (5) When miniaturizing a coil, consider increase in direct current resistance and decrease in rated current. An increase in DC resistance can cause a deterioration of power conversion efficiency. A decrease in rated current can saturate the coil when outputting a large current, which may deteriorate efficiency or make it impossible to obtain the desired output current.
- (6) If there is a possibility that the output will short-circuit, use a coil with a rated current that is larger than the maximum IC output current. For example, even when up to 100 mA is actually used for an IC that can output 1 A, select a coil whose rated current is larger than 1 A. If a coil with a small rated current is used, it will be saturated by a large current in the event of output short-circuiting, resulting in a steep increase in output voltage. The IC may be broken down because the processing speed of the overcurrent protecting function of the IC cannot keep up with the increase in voltage.
- (7) This circuit constant is the value for our evaluation board. It may be necessary to adjust the constant for the actual board. Carry out suitable evaluations.



# Notice

## Precaution on using ROHM Products

- Our Products are designed and manufactured for application in ordinary electronic equipments (such as AV equipment, OA equipment, telecommunication equipment, home electronic appliances, amusement equipment, etc.). If you intend to use our Products in devices requiring extremely high reliability (such as medical equipment <sup>(Note 1)</sup>, transport equipment, traffic equipment, aircraft/spacecraft, nuclear power controllers, fuel controllers, car equipment including car accessories, safety devices, etc.) and whose malfunction or failure may cause loss of human life, bodily injury or serious damage to property ("Specific Applications"), please consult with the ROHM sales representative in advance. Unless otherwise agreed in writing by ROHM in advance, ROHM shall not be in any way responsible or liable for any damages, expenses or losses incurred by you or third parties arising from the use of any ROHM's Products for Specific Applications.

(Note1) Medical Equipment Classification of the Specific Applications

JAPAN	USA	EU	CHINA
CLASS III	CLASS III	CLASS II b	CLASS III
CLASS IV		CLASS III	

- ROHM designs and manufactures its Products subject to strict quality control system. However, semiconductor products can fail or malfunction at a certain rate. Please be sure to implement, at your own responsibilities, adequate safety measures including but not limited to fail-safe design against the physical injury, damage to any property, which a failure or malfunction of our Products may cause. The following are examples of safety measures:
  - Installation of protection circuits or other protective devices to improve system safety
  - Installation of redundant circuits to reduce the impact of single or multiple circuit failure
- Our Products are designed and manufactured for use under standard conditions and not under any special or extraordinary environments or conditions, as exemplified below. Accordingly, ROHM shall not be in any way responsible or liable for any damages, expenses or losses arising from the use of any ROHM's Products under any special or extraordinary environments or conditions. If you intend to use our Products under any special or extraordinary environments or conditions (as exemplified below), your independent verification and confirmation of product performance, reliability, etc. prior to use, must be necessary:
  - Use of our Products in any types of liquid, including water, oils, chemicals, and organic solvents
  - Use of our Products outdoors or in places where the Products are exposed to direct sunlight or dust
  - Use of our Products in places where the Products are exposed to sea wind or corrosive gases, including Cl<sub>2</sub>, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, and NO<sub>2</sub>
  - Use of our Products in places where the Products are exposed to static electricity or electromagnetic waves
  - Use of our Products in proximity to heat-producing components, plastic cords, or other flammable items
  - Sealing or coating our Products with resin or other coating materials
  - Use of our Products without cleaning residue of flux (even if you use no-clean type fluxes, cleaning residue of flux is recommended); or Washing our Products by using water or water-soluble cleaning agents for cleaning residue after soldering
  - Use of the Products in places subject to dew condensation
- The Products are not subject to radiation-proof design.
- Please verify and confirm characteristics of the final or mounted products in using the Products.
- In particular, if a transient load (a large amount of load applied in a short period of time, such as pulse. is applied, confirmation of performance characteristics after on-board mounting is strongly recommended. Avoid applying power exceeding normal rated power; exceeding the power rating under steady-state loading condition may negatively affect product performance and reliability.
- De-rate Power Dissipation depending on ambient temperature. When used in sealed area, confirm that it is the use in the range that does not exceed the maximum junction temperature.
- Confirm that operation temperature is within the specified range described in the product specification.
- ROHM shall not be in any way responsible or liable for failure induced under deviant condition from what is defined in this document.

## Precaution for Mounting / Circuit board design

- When a highly active halogenous (chlorine, bromine, etc.) flux is used, the residue of flux may negatively affect product performance and reliability.
- In principle, the reflow soldering method must be used on a surface-mount products, the flow soldering method must be used on a through hole mount products. If the flow soldering method is preferred on a surface-mount products, please consult with the ROHM representative in advance.

For details, please refer to ROHM Mounting specification

### Precautions Regarding Application Examples and External Circuits

1. If change is made to the constant of an external circuit, please allow a sufficient margin considering variations of the characteristics of the Products and external components, including transient characteristics, as well as static characteristics.
2. You agree that application notes, reference designs, and associated data and information contained in this document are presented only as guidance for Products use. Therefore, in case you use such information, you are solely responsible for it and you must exercise your own independent verification and judgment in the use of such information contained in this document. ROHM shall not be in any way responsible or liable for any damages, expenses or losses incurred by you or third parties arising from the use of such information.

### Precaution for Electrostatic

This Product is electrostatic sensitive product, which may be damaged due to electrostatic discharge. Please take proper caution in your manufacturing process and storage so that voltage exceeding the Products maximum rating will not be applied to Products. Please take special care under dry condition (e.g. Grounding of human body / equipment / solder iron, isolation from charged objects, setting of Ionizer, friction prevention and temperature / humidity control).

### Precaution for Storage / Transportation

1. Product performance and soldered connections may deteriorate if the Products are stored in the places where:
  - [a] the Products are exposed to sea winds or corrosive gases, including Cl<sub>2</sub>, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, and NO<sub>2</sub>
  - [b] the temperature or humidity exceeds those recommended by ROHM
  - [c] the Products are exposed to direct sunshine or condensation
  - [d] the Products are exposed to high Electrostatic
2. Even under ROHM recommended storage condition, solderability of products out of recommended storage time period may be degraded. It is strongly recommended to confirm solderability before using Products of which storage time is exceeding the recommended storage time period.
3. Store / transport cartons in the correct direction, which is indicated on a carton with a symbol. Otherwise bent leads may occur due to excessive stress applied when dropping of a carton.
4. Use Products within the specified time after opening a humidity barrier bag. Baking is required before using Products of which storage time is exceeding the recommended storage time period.

### Precaution for Product Label

A two-dimensional barcode printed on ROHM Products label is for ROHM's internal use only.

### Precaution for Disposition

When disposing Products please dispose them properly using an authorized industry waste company.

### Precaution for Foreign Exchange and Foreign Trade act

Since concerned goods might be fallen under listed items of export control prescribed by Foreign exchange and Foreign trade act, please consult with ROHM in case of export.

### Precaution Regarding Intellectual Property Rights

1. All information and data including but not limited to application example contained in this document is for reference only. ROHM does not warrant that foregoing information or data will not infringe any intellectual property rights or any other rights of any third party regarding such information or data.
2. ROHM shall not have any obligations where the claims, actions or demands arising from the combination of the Products with other articles such as components, circuits, systems or external equipment (including software).
3. No license, expressly or implied, is granted hereby under any intellectual property rights or other rights of ROHM or any third parties with respect to the Products or the information contained in this document. Provided, however, that ROHM will not assert its intellectual property rights or other rights against you or your customers to the extent necessary to manufacture or sell products containing the Products, subject to the terms and conditions herein.

### Other Precaution

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**General Precaution**

1. Before you use our Products, you are requested to carefully read this document and fully understand its contents. ROHM shall not be in any way responsible or liable for failure, malfunction or accident arising from the use of any ROHM's Products against warning, caution or note contained in this document.
2. All information contained in this document is current as of the issuing date and subject to change without any prior notice. Before purchasing or using ROHM's Products, please confirm the latest information with a ROHM sales representative.
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