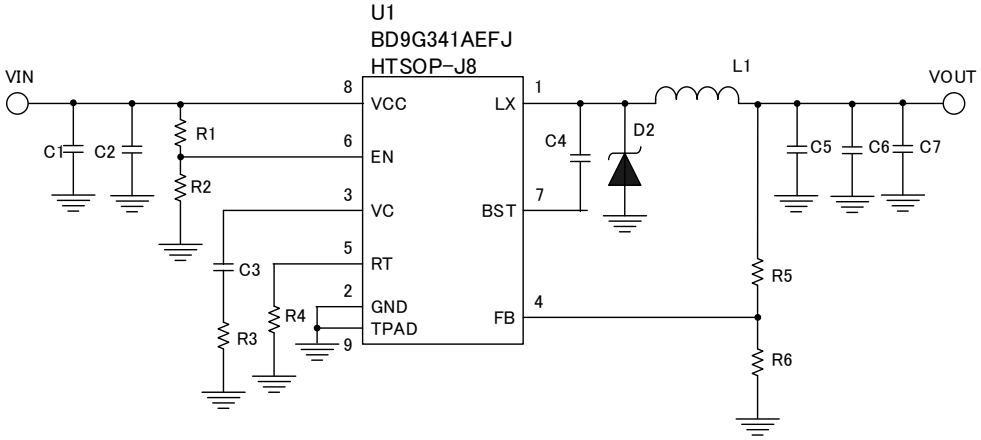
AEP58-D1-0006-2

DC/DC Converter Application Information

IC Product Name	BD9G341AEFJ
Topology	Buck (Step-Down) Switching Regulator
Type	Non-Isolation

No	Vin[V]	Output	Frequency[kHz]
1	24-36	3.3V, 3A	300
2	24-60	5V, 3A	500
3	24-48	5.1V, 3A	200
4	35-60	6.3V, 2A	200
5	24-60	12V, 3A	200
6	24-48	15V, 3A	200
7	37-48	18V, 2A	200
8	24-32	20V, 3A	200
9	30-42.5	24V, 2A	300
10	37-48	28V, 2A	200
11	60	40V, 2A	500

■Typical Application Circuit



■ RT terminal setting（5-pin）

Terminal state	Setting operational frequency
Connect resistor	$\mathrm{RT} = \dfrac{\frac{1}{f} - 400 \times 10^{-9}}{96.48 \times 10^{-12}} [\Omega]$

■ EN terminal setting （6-pin）

Terminal state	IC operation
≥ 2.6V	Normal operation
≤ 2.6V	Power down

■UVLO detect voltage setting with EN terminal external resistor

$$\mathrm{R1} = \frac{Vuvhys}{IEN} [\Omega]$$

$$\mathrm{R2} = \frac{VFN \times R1}{Vuv - VEN} [\Omega]$$

IEN:EN pin source current 10uA(typ)　VEN: EN pin output on threshold　2.6V(typ)
As an example in typical sample, When Vcc voltage which IC turned on 15V, Hysteresis width 1V,
The resistance divider　set to R1=100kΩ,R2=20kΩ.

■Output voltage setting

$$V_{OUT} = \frac{R_5 + R_6}{R_6} \times 1.0\ [V]$$

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

$$V_{OUT} = 1.0V \sim V_{IN}\ [V]$$

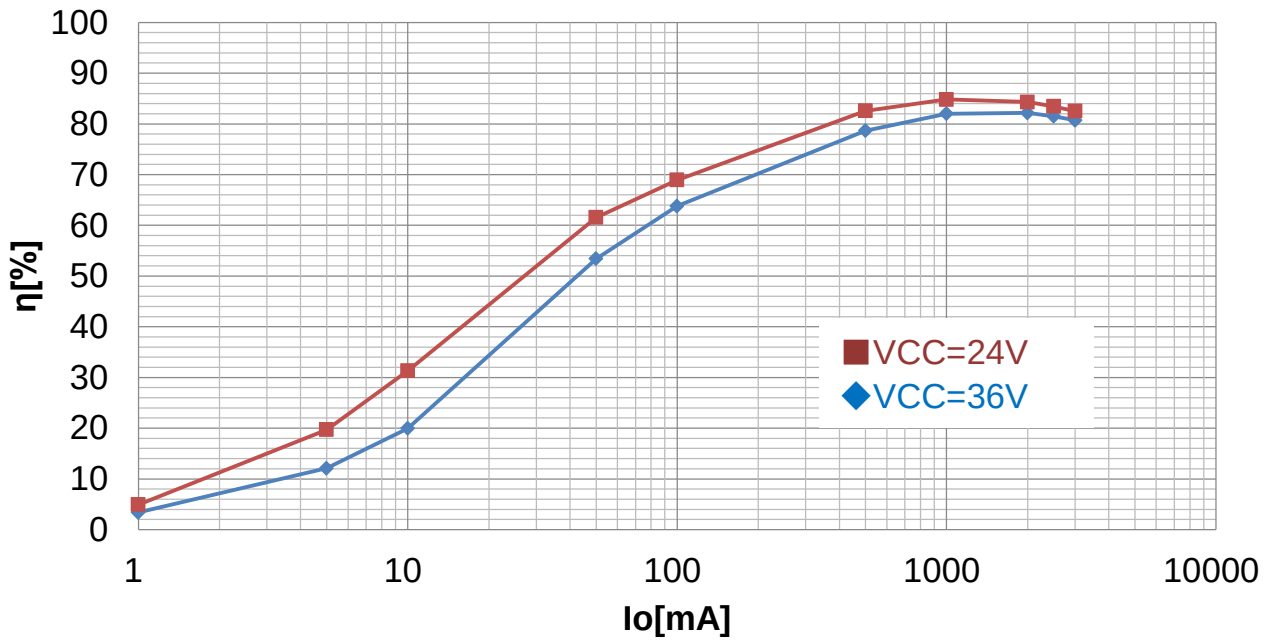
The available minimum output voltage is restricted by minimum duty shown as the following.
MinDuty = f ×MinOnTime　(MinDuty : minimum duty, f : frequency, MinOnTime : minimum on time)
When the calculated voltage, VCC×MinDuty, is higher than 1V, the minimum output voltage is determined by VCC × MinDuty.

The available maximum output voltage is restricted by maximum duty shown as the following.
MaxDuty =1 - f × Toff_f　(MaxDuty : maximum duty, Toff _f : Forced off time)
The available maximum output is shown as the following.
Maximum output voltage = VCC × MaxDuty – Iout ×Ron (Iout : load current, Ron : NMOS ON resistance)

■Bill of Materials

1. VO=3.3V, 3A (VIN=24V to 36V)

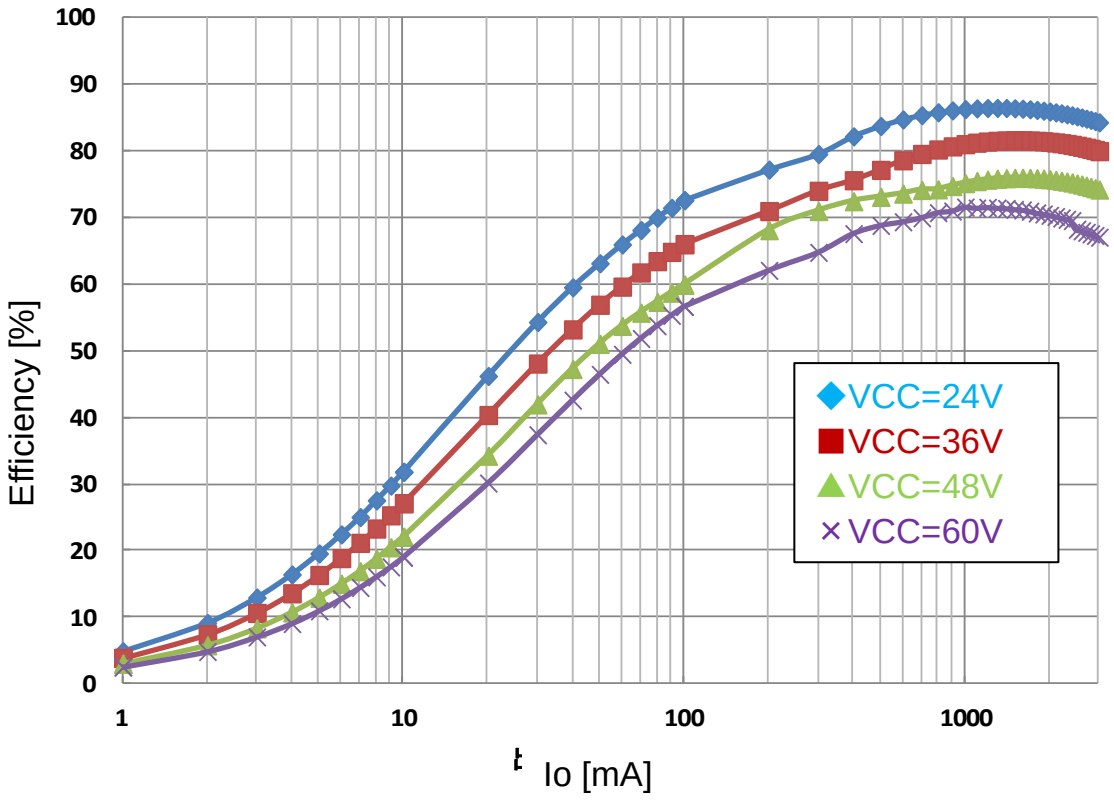
Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	10uF	50V, X7R, ±10%	GRM32ER71H106KA12L	MURATA	3225
1	C3	Ceramic Capacitor	6800pF	50V, X7R, ±10%	GRM188R71H682KA01D	MURATA	1608
1	C4	Ceramic Capacitor	0.10uF	50V, X7R, ±10%	GRM188R71H104KA93D	MURATA	1608
1	C5	Ceramic Capacitor	100uF	10V, X5R, ±20%	GRM32ER61A107ME20	MURATA	3225
1	D2	Diode	-	90V, 6A	RB095B-90TL	ROHM	
1	L1	Inductor	15µH	±30%, DCR=41mΩmax, 4.15A	CDRH105RNP-150NC-Q	SUMIDA	10.3 x 10.5
				±20%, DCR=25.2mΩmax, 5.5A	CLF12577NIT- 150M	TDK	12.5 x 12.5
				±20%, DCR=26.0mΩmax, 5.7A	732777150	WURTH	12.0 x 12.0
				±20%, DCR=26.0mΩmax, 5.7A	IHLP4040DZER150M11	VISHAY	10.3 x 10.3
1	R1	Resistor	110kΩ	0.1W, 50V, 1%	MCR03EZPFX1103	ROHM	1608
1	R2	Resistor	27kΩ	0.1W, 50V, 1%	MCR03EZPFX2702	ROHM	1608
1	R3	Resistor	10kΩ	0.1W, 50V, 1%	MCR03EZPFX1002	ROHM	1608
1	R4	Resistor	30kΩ	0.1W, 50V, 1%	MCR03EZPFX3002	ROHM	1608
1	R5	Resistor	1.3kΩ	0.1W, 50V, 0.5%	MCR03EZPD1301	ROHM	1608
1	R6	Resistor	560Ω	0.1W, 50V, 0.5%	MCR03EZPD5600	ROHM	1608
1	U1	IC	-	Buck DC/DC Converter	BD9G341AEFJ	ROHM	4960
1	C2, C6, C7	Open	-	-	-	-	-



■Bill of Materials (continued)

2. VO=5.0V, Io=3A, (VIN=24V to 48V), Fosc=500kHz

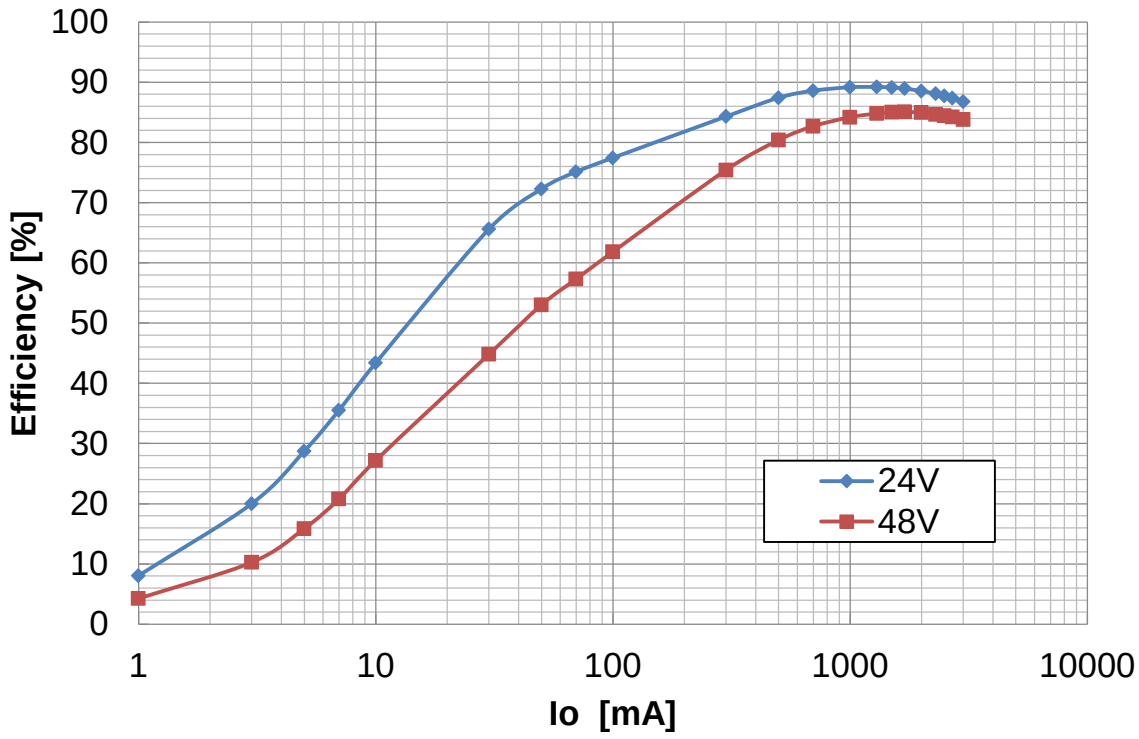
Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	10uF	100V, X7S, 20±%	C5750X7S2A106K	TDK	5750
				100V, X7R, ±20%	KRM55TR72A106MH01K	MURATA	6153
2	C3, C4	Ceramic Capacitor	0.10uF	50V, X7R, ±10%	GRM188R71H104KA93D	MURATA	1608
2	C5, C6	Ceramic Capacitor	47uF	16V, B, ±10%	GRM32EB31C476K	MURATA	3225
1	D2	Diode	-	90V, 6A	RB095B-90	ROHM	
1	L1	Inductor	15µH	±30%, DCR=41mΩmax, 4.15A	CDRH105RNP-150NC-Q	SUMIDA	10.3 x 10.5
				±20%, DCR=25.2mΩmax, 5.5A	CLF12577NIT- 150M	TDK	12.5 x 12.5
				±20%, DCR=26.0mΩmax, 5.7A	732777150	WURTH	12.0 x 12.0
				±20%, DCR=26.0mΩmax, 5.7A	IHLP4040DZER150M11	VISHAY	10.3 x 10.3
1	R1	Resistor	110kΩ	0.1W, 50V, 1%	MCR03EZPFX1103	ROHM	1608
1	R2	Resistor	27kΩ	0.1W, 50V, 1%	MCR03EZPFX2702	ROHM	1608
1	R3	Resistor	4.7kΩ	0.1W, 50V, 1%	MCR03EZPFX4701	ROHM	1608
1	R4	Resistor	13kΩ	0.1W, 50V, 1%	MCR03EZPFX1302	ROHM	1608
1	R5	Resistor	3kΩ	0.1W, 50V, 0.5%	MCR03EZPD3001	ROHM	1608
1	R6	Resistor	750Ω	0.1W, 50V, 0.5%	MCR03EZPD7500	ROHM	1608
1	U1	IC	-	Buck DC/DC Converter	BD9G341AEFJ	ROHM	4960
1	C2, C7	Open	-	-	-	-	-



■Bill of Materials (continued)

3. VO=5.1V, Io=3A, (VIN=24V to 48V), Fosc=200kHz

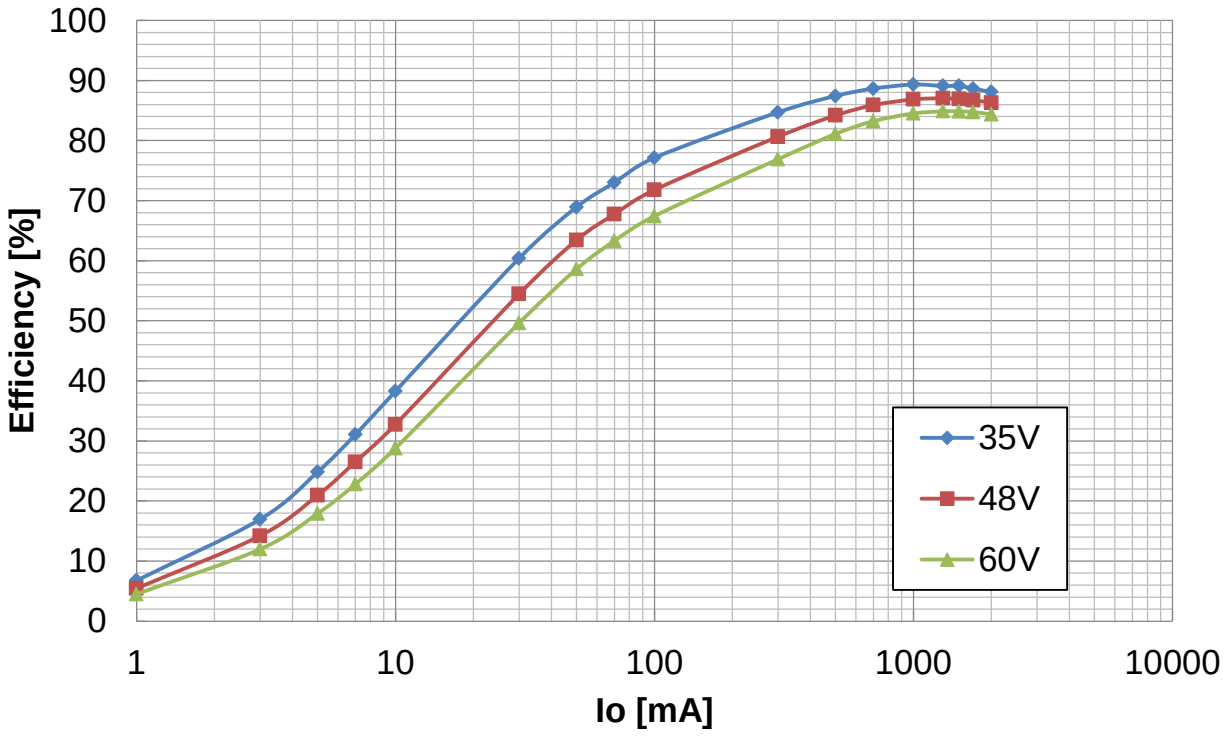
Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	10uF	50V, X7R, ±10%	GRM32ER71H106KA12L	MURATA	3225
2	C3, C4	Ceramic Capacitor	0.10uF	50V, X7R, ±10%	GRM188R71H104KA93D	MURATA	1608
2	C5, C6	Ceramic Capacitor	47uF	16V, B, ±10%	GRM32EB31C476K	MURATA	3225
1	D2	Diode	-	60V, 3A	RB050L-60	ROHM	
1	L1	Inductor	33µH	±20%, DCR=52mΩmax, 4.25A	CDRH129HF-330MC	SUMIDA	12.5 x 12.5
				±20%, DCR=52mΩmax, 4.2A	7447709330	WURTH	12 x 12
				±20%, DCR=94.5mΩmax, 4.0A	IHLP4040DZER330M11	VISHAY	10.3 x 10.3
				±20%, DCR=51.0mΩmax, 3.88A	CLF12577NIT- 330M	TDK	12.5 x 12.5
1	R1	Resistor	110kΩ	0.1W, 50V, 1%	MCR03EZPFX1103	ROHM	1608
1	R2	Resistor	27kΩ	0.1W, 50V, 1%	MCR03EZPFX2702	ROHM	1608
1	R3	Resistor	3.3kΩ	0.1W, 50V, 1%	MCR03EZPFX3301	ROHM	1608
1	R4	Resistor	47kΩ	0.1W, 50V, 1%	MCR03EZPFX4702	ROHM	1608
1	R5	Resistor	8.2kΩ	0.1W, 50V, 0.5%	MCR03EZPD8201	ROHM	1608
1	R6	Resistor	2kΩ	0.1W, 50V, 0.5%	MCR03EZPD2001	ROHM	1608
1	U1	IC	-	Buck DC/DC Converter	BD9G341AEFJ	ROHM	4960
1	C2, C7	Open	-	-	-	-	-



■Bill of Materials (continued)

4. VO=6.3V, Io=2A, (VIN=35V to 60V), Fosc=200kHz

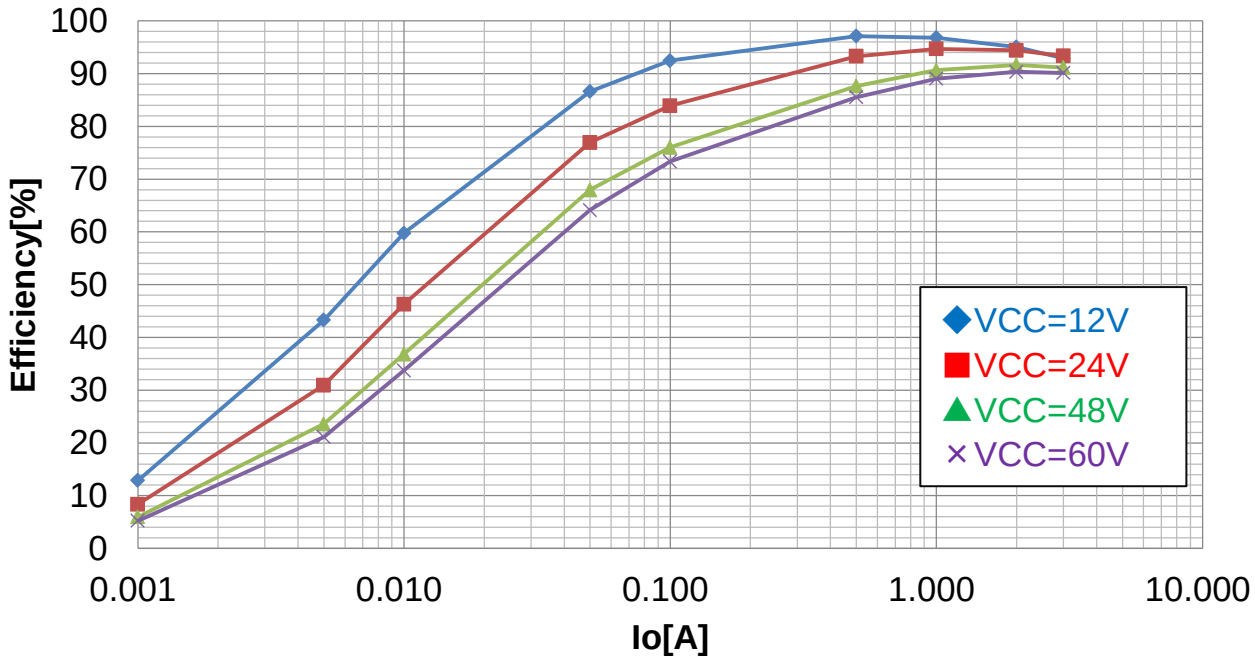
Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	10uF	100V, X7S, 20±%	C5750X7S2A106K	TDK	5750
				100V, X7R, ±20%	KRM55TR72A106MH01K	MURATA	6153
1	C3	Ceramic Capacitor	6800pF	50V, X7R, ±10%	GRM188R71H682KA01D	MURATA	1608
1	C4	Ceramic Capacitor	0.10uF	50V, X7R, ±10%	GRM188R71H104KA93D	MURATA	1608
2	C5, C6	Ceramic Capacitor	47uF	16V, B, ±10%	GRM32EB31C476K	MURATA	3225
1	D2	Diode	-	90V, 6A	RB095B-90	ROHM	
1	L1	Inductor	33µH	±20%, DCR=52mΩmax, 4.25A	CDRH129HF-330MC	SUMIDA	12.5 x 12.5
				±20%, DCR=52mΩmax, 4.2A	7447709330	WURTH	12 x 12
				±20%, DCR=94.5mΩmax, 4.0A	IHLP4040DZER330M11	VISHAY	10.3 x 10.3
				±20%, DCR=51.0mΩmax, 3.88A	CLF12577NIT- 330M	TDK	12.5 x 12.5
1	R1	Resistor	110kΩ	0.1W, 50V, 1%	MCR03EZPFX1103	ROHM	1608
1	R2	Resistor	27kΩ	0.1W, 50V, 1%	MCR03EZPFX2702	ROHM	1608
1	R3	Resistor	10kΩ	0.1W, 50V, 1%	MCR03EZPFX1002	ROHM	1608
1	R4	Resistor	47kΩ	0.1W, 50V, 1%	MCR03EZPFX4702	ROHM	1608
1	R5	Resistor	3.3kΩ	0.1W, 50V, 0.5%	MCR03EZPD3301	ROHM	1608
1	R6	Resistor	620Ω	0.1W, 50V, 0.5%	MCR03EZPD6200	ROHM	1608
1	U1	IC	-	Buck DC/DC Converter	BD9G341AEFJ	ROHM	4960
1	C2, C7	Open	-	-	-	-	-



■Bill of Materials (continued)

5. VO=12V, Io=3A, (VIN=24V to 48V), Fosc=200kHz

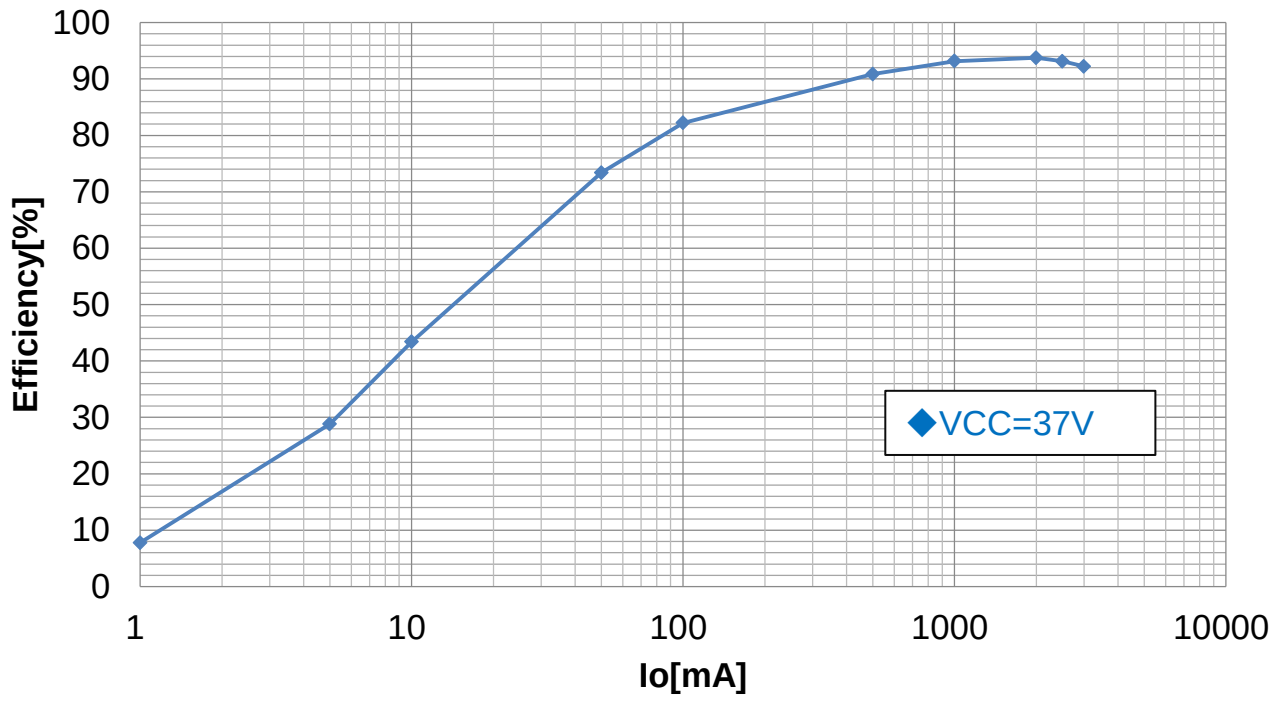
Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	10uF	100V, X7S, 20±%	C5750X7S2A106K	TDK	5750
				100V, X7R, ±20%	KRM55TR72A106MH01K	MURATA	6153
1	C3	Ceramic Capacitor	6800pF	50V, X7R, ±10%	GRM188R71H682KA01D	MURATA	1608
1	C4	Ceramic Capacitor	0.10uF	50V, X7R, ±10%	GRM188R71H104KA93D	MURATA	1608
2	C5, C6	Ceramic Capacitor	47uF	16V, B, ±10%	GRM32EB31C476K	MURATA	3225
1	D2	Diode	-	90V, 6A	RB095B-90TL	ROHM	6595
1	L1	Inductor	33µH	±20%, DCR=52mΩmax, 4.25A	CDRH129HF-330MC	SUMIDA	12.5 x 12.5
				±20%, DCR=52mΩmax, 4.2A	7447709330	WURTH	12 x 12
				±20%, DCR=94.5mΩmax, 4.0A	IHLP4040DZER330M11	VISHAY	10.3 x 10.3
				±20%, DCR=51.0mΩmax, 3.88A	CLF12577NIT- 330M	TDK	12.5 x 12.5
1	R1	Resistor	110kΩ	0.1W, 50V, 1%	MCR03EZPFX1103	ROHM	1608
1	R2	Resistor	27kΩ	0.1W, 50V, 1%	MCR03EZPFX2702	ROHM	1608
1	R3	Resistor	4.7kΩ	0.1W, 50V, 1%	MCR03EZPFX4701	ROHM	1608
1	R4	Resistor	47kΩ	0.1W, 50V, 1%	MCR03EZPFX4702	ROHM	1608
1	R5	Resistor	3.3kΩ	0.1W, 50V, 0.5%	MCR03EZPD3301	ROHM	1608
1	R6	Resistor	300Ω	0.1W, 50V, 0.5%	MCR03EZPD3000	ROHM	1608
1	U1	IC	-	Buck DC/DC Converter	BD9G341AEFJ	ROHM	4960
1	C2, C7	Open	-	-	-	-	-



■Bill of Materials (continued)

6. VO=15V, Io=3A, (VIN=24V to 48V), Fosc=200kHz

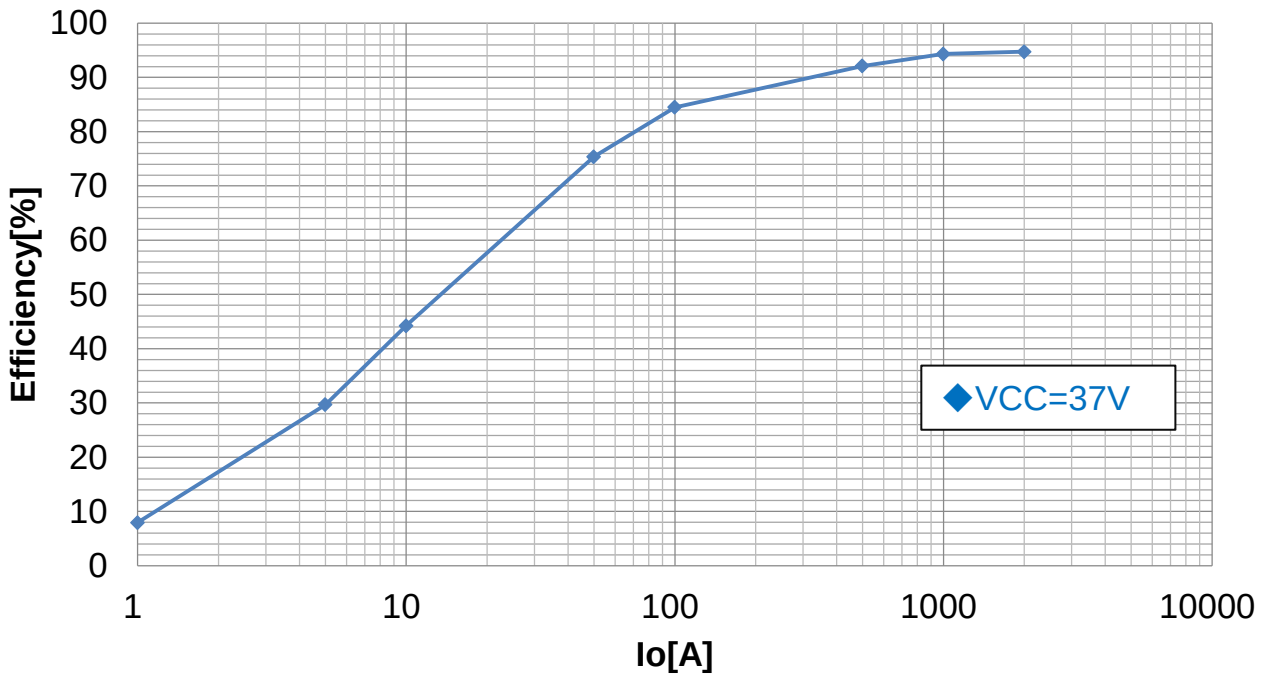
Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	10uF	50V, X7R, ±10%	GRM32ER71H106KA12L	MURATA	3225
1	C3	Ceramic Capacitor	6800pF	50V, X7R, ±10%	GRM188R71H682KA01D	MURATA	1608
1	C4	Ceramic Capacitor	0.10uF	50V, X7R, ±10%	GRM188R71H104KA93D	MURATA	1608
2	C5, C6	Ceramic Capacitor	47uF	16V, B, ±10%	GRM32EB31C476K	MURATA	3225
1	D2	Diode	-	90V, 6A	RB095B-90TL	ROHM	6595
1	L1	Inductor	33µH	±20%, DCR=52mΩmax, 4.25A	CDRH129HF-330MC	SUMIDA	12.5 x 12.5
				±20%, DCR=52mΩmax, 4.2A	7447709330	WURTH	12 x 12
				±20%, DCR=94.5mΩmax, 4.0A	IHLP4040DZER330M11	VISHAY	10.3 x 10.3
				±20%, DCR=51.0mΩmax, 3.88A	CLF12577NIT- 330M	TDK	12.5 x 12.5
1	R1	Resistor	110kΩ	0.1W, 50V, 1%	MCR03EZPFX1103	ROHM	1608
1	R2	Resistor	18kΩ	0.1W, 50V, 1%	MCR03EZPFX1802	ROHM	1608
1	R3	Resistor	10kΩ	0.1W, 50V, 1%	MCR03EZPFX1002	ROHM	1608
1	R4	Resistor	47kΩ	0.1W, 50V, 1%	MCR03EZPFX4702	ROHM	1608
1	R5	Resistor	3.3kΩ	0.1W, 50V, 0.5%	MCR03EZPD3301	ROHM	1608
1	R5 (series)	Resistor	300Ω	0.1W, 50V, 0.5%	MCR03EZPD3300	ROHM	1608
1	R6	Resistor	300Ω	0.1W, 50V, 0.5%	MCR03EZPD3000	ROHM	1608
1	U1	IC	-	Buck DC/DC Converter	BD9G341AEFJ	ROHM	4960
1	C2, C7	Open	-	-	-	-	-



■Bill of Materials (continued)

7. VO=18V, Io=2A, (VIN=37V to 48V), Fosc=200kHz

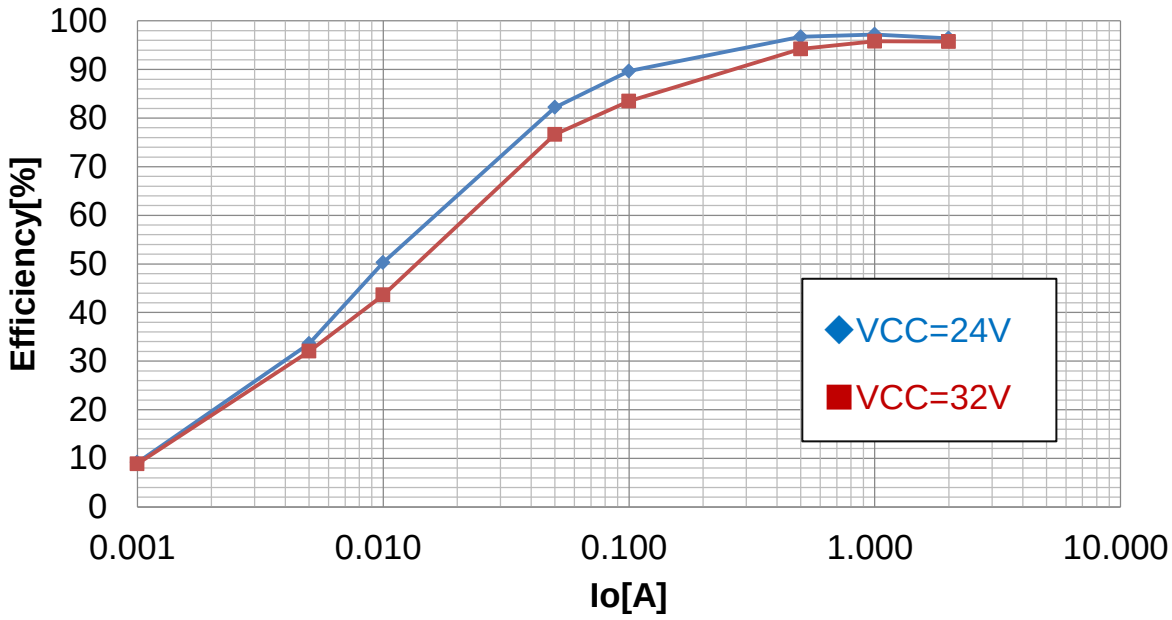
Total Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	10uF	50V, X7R, ±10%	GRM32ER71H106KA12L	MURATA	3225
1	C3	Ceramic Capacitor	6800pF	50V, X7R, ±10%	GRM188R71H682KA01D	MURATA	1608
1	C4	Ceramic Capacitor	0.10uF	50V, X7R, ±10%	GRM188R71H104KA93D	MURATA	1608
4	C5, C6, C7, C7'	Ceramic Capacitor	22uF	25V, X5R, ±20%	GRM21BR61E226ME44	MURATA	2012
1	D2	Diode	-	60V, 3A	RB050L-60	ROHM	2645
1	L1	Inductor	33µH	±20%, DCR=52mΩmax, 4.25A	CDRH129HF-330MC	SUMIDA	12.5 x 12.5
				±20%, DCR=52mΩmax, 4.2A	7447709330	WURTH	12 x 12
				±20%, DCR=94.5mΩmax, 4.0A	IHLP4040DZER330M11	VISHAY	10.3 x 10.3
				±20%, DCR=51.0mΩmax, 3.88A	CLF12577NIT- 330M	TDK	12.5 x 12.5
1	R1	Resistor	110kΩ	0.1W, 50V, 1%	MCR03EZPFX1103	ROHM	1608
1	R2	Resistor	15kΩ	0.1W, 50V, 1%	MCR03EZPFX1502	ROHM	1608
1	R3	Resistor	10kΩ	0.1W, 50V, 1%	MCR03EZPFX1002	ROHM	1608
1	R4	Resistor	47kΩ	0.1W, 50V, 1%	MCR03EZPFX4702	ROHM	1608
1	R5	Resistor	5.1kΩ	0.1W, 50V, 0.5%	MCR03EZPD5101	ROHM	1608
1	R6	Resistor	300Ω	0.1W, 50V, 0.5%	MCR03EZPD3000	ROHM	1608
1	U1	IC	-	Buck DC/DC Converter	BD9G341AEFJ	ROHM	4960
1	C2	Open	-	-	-	-	-



■Bill of Materials (continued)

8. VO=20V, Io=3A, (VIN=24V to 32V), Fosc=200kHz

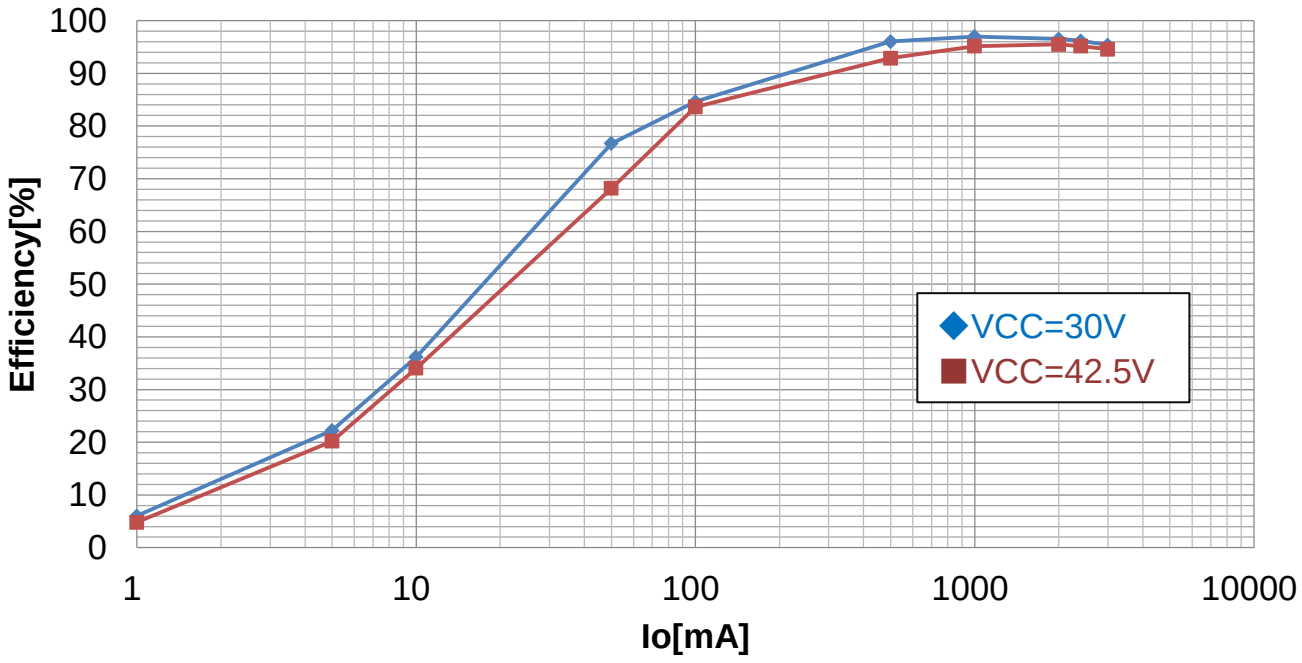
Total Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	10uF	50V, X7R, ±10%	GRM32ER71H106KA12L	MURATA	3225
1	C3	Ceramic Capacitor	6800pF	50V, X7R, ±10%	GRM188R71H682KA01D	MURATA	1608
1	C4	Ceramic Capacitor	0.10uF	50V, X7R, ±10%	GRM188R71H104KA93D	MURATA	1608
2	C5, C6	Ceramic Capacitor	10uF	50V, B, ±10%	GRM32EB31H106KA12L	MURATA	3225
1	D2	Diode	-	60V, 3A	RB050L-60	ROHM	2645
1	L1	Inductor	33µH	±20%, DCR=52mΩmax, 4.25A	CDRH129HF-330MC	SUMIDA	12.5 x 12.5
				±20%, DCR=52mΩmax, 4.2A	7447709330	WURTH	12 x 12
				±20%, DCR=94.5mΩmax, 4.0A	IHLP4040DZER330M11	VISHAY	10.3 x 10.3
				±20%, DCR=51.0mΩmax, 3.88A	CLF12577NIT- 330M	TDK	12.5 x 12.5
1	R1	Resistor	100kΩ	0.1W, 50V, 1%	MCR03EZPFX1003	ROHM	1608
1	R2	Resistor	13kΩ	0.1W, 50V, 1%	MCR03EZPFX1302	ROHM	1608
1	R3	Resistor	10kΩ	0.1W, 50V, 1%	MCR03EZPFX1002	ROHM	1608
1	R4	Resistor	47kΩ	0.1W, 50V, 1%	MCR03EZPFX4702	ROHM	1608
1	R5	Resistor	6.8kΩ	0.1W, 50V, 0.5%	MCR03EZPD6801	ROHM	1608
1	R5(series)	Resistor	39Ω	0.1W, 50V, 0.5%	MCR03EZPD39R0	ROHM	1608
1	R6	Resistor	360Ω	0.1W, 50V, 0.5%	MCR03EZPD3600	ROHM	1608
1	U1	IC	-	Buck DC/DC Converter	BD9G341AEFJ	ROHM	4960
1	C2, C7	Open	-	-	-	-	-



■Bill of Materials (continued)

9. VO=24V, Io=2A, (VIN=30V to 42.5V), Fosc=300kHz

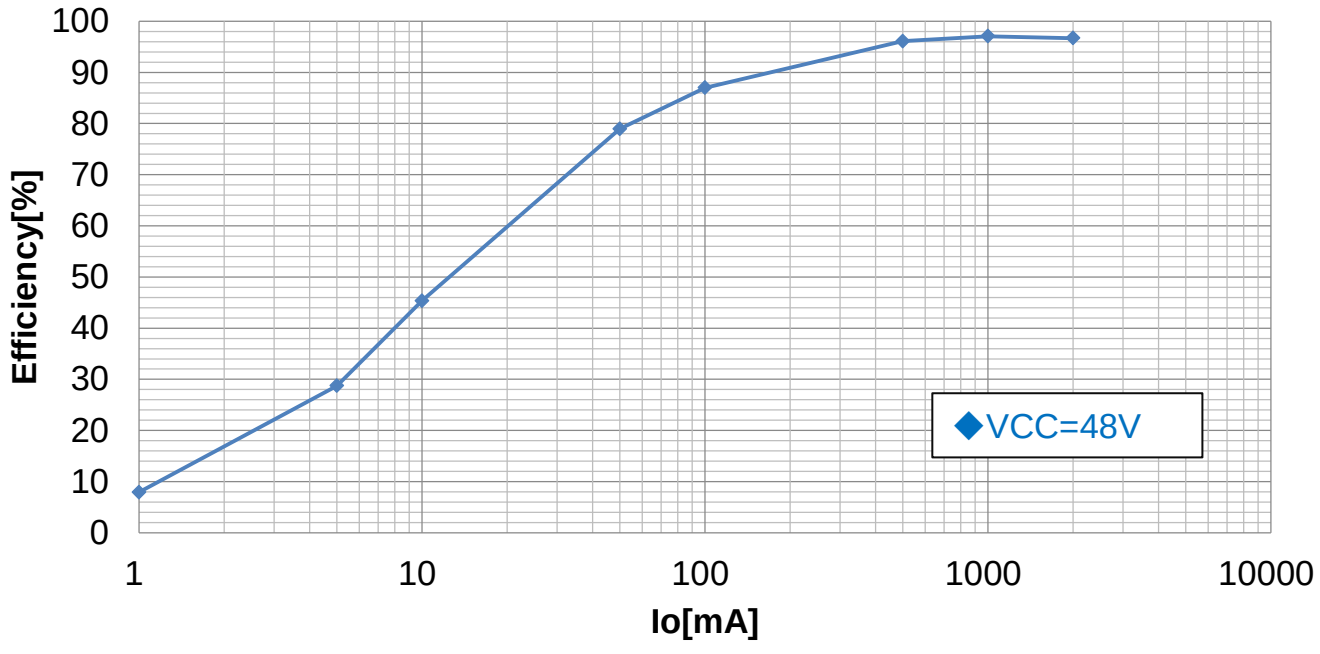
Total Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	10uF	50V, X7R, ±10%	GRM32ER71H106KA12L	MURATA	3225
1	C3	Ceramic Capacitor	4700pF	50V, B1, ±10%	GRM155B11H472KA01	MURATA	1005
1	C4	Ceramic Capacitor	0.10uF	50V, X7R, ±10%	GRM188R71H104KA93D	MURATA	1608
2	C5, C6	Ceramic Capacitor	10uF	50V, B, ±10%	GRM32EB31H106KA12L	MURATA	3225
1	D2	Diode	-	60V, 3A	RB050L-60	ROHM	2645
1	L1	Inductor	22µH	±30%, DCR=61mΩmax, 3.6A	CDRH105RNP-220NC-Q	SUMIDA	10.5 x 10.3
				±20%, DCR=35.4mΩmax, 5.0A	CLF12577NIT- 220M	TDK	12.5 x 12.5
				±20%, DCR=28.3mΩmax, 3.9A	#931BS-220M=P3	TOKO	12.3 x 12.3
				±20%, DCR=66.0mΩmax, 4.5A	IHLP4040DZER220M11	VISHAY	10.3 x 10.3
1	R1	Resistor	100kΩ	0.1W, 50V, 1%	MCR03EZPFX1003	ROHM	1608
1	R2	Resistor	13kΩ	0.1W, 50V, 1%	MCR03EZPFX1302	ROHM	1608
1	R3	Resistor	22kΩ	0.1W, 50V, 1%	MCR03EZPFX2202	ROHM	1608
1	R4	Resistor	30kΩ	0.1W, 50V, 1%	MCR03EZPFX3002	ROHM	1608
1	R5	Resistor	6.8kΩ	0.1W, 50V, 0.5%	MCR03EZPD6801	ROHM	1608
1	R5(series)	Resistor	100Ω	0.1W, 50V, 0.5%	MCR03EZPD1000	ROHM	1608
1	R6	Resistor	300Ω	0.1W, 50V, 0.5%	MCR03EZPD3000	ROHM	1608
1	U1	IC	-	Buck DC/DC Converter	BD9G341AEFJ	ROHM	4960
1	C2, C7	Open	-	-	-	-	-



■Bill of Materials (continued)

10. VO=28V, Io=2A, (VIN=37V to 48V), Fosc=200kHz

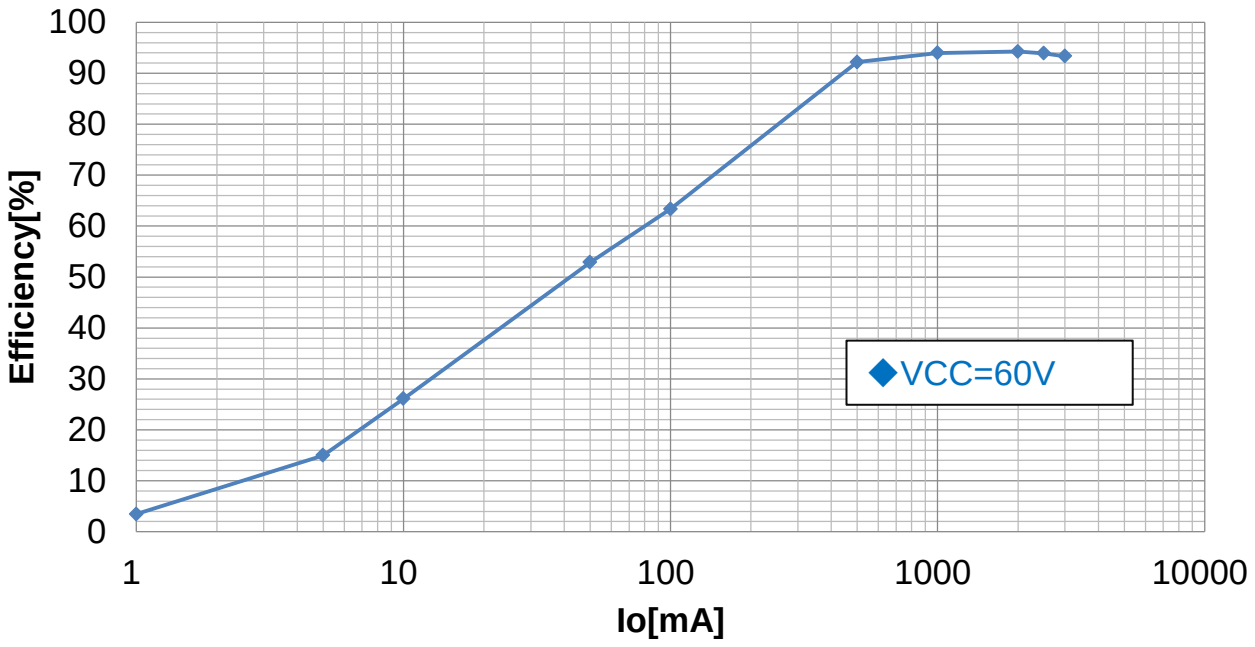
Total Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	10uF	50V, X7R, ±10%	GRM32ER71H106KA12L	MURATA	3225
1	C3	Ceramic Capacitor	6800pF	50V, X7R, ±10%	GRM188R71H682KA01D	MURATA	1608
1	C4	Ceramic Capacitor	0.10uF	50V, X7R, ±10%	GRM188R71H104KA93D	MURATA	1608
4	C5, C6, C7, C7'	Ceramic Capacitor	10uF	50V, B, ±10%	GRM32EB31H106KA12L	MURATA	3225
1	D2	Diode	-	60V, 3A	RB050L-60	ROHM	2645
1	L1	Inductor	33µH	±30%, DCR=84mΩmax, 2.95A	CDRH105RNP-330NC-Q	SUMIDA	10.5 x 10.3
				±20%, DCR=52mΩmax, 4.2A	7447709330	WURTH	12 x 12
				±20%, DCR=94.5mΩmax, 4.0A	IHLP4040DZER330M11	VISHAY	10.3 x 10.3
				±20%, DCR=51.0mΩmax, 3.88A	CLF12577NIT- 330M	TDK	12.5 x 12.5
1	R1	Resistor	130kΩ	0.1W, 50V, 1%	MCR03EZPFX1303	ROHM	1608
1	R2	Resistor	12kΩ	0.1W, 50V, 1%	MCR03EZPFX1202	ROHM	1608
1	R3	Resistor	10kΩ	0.1W, 50V, 1%	MCR03EZPFX1002	ROHM	1608
1	R4	Resistor	47kΩ	0.1W, 50V, 1%	MCR03EZPFX4702	ROHM	1608
1	R5	Resistor	5.1kΩ	0.1W, 50V, 0.5%	MCR03EZPD5101	ROHM	1608
1	R5(series)	Resistor	3kΩ	0.1W, 50V, 0.5%	MCR03EZPD3001	ROHM	1608
1	R6	Resistor	300Ω	0.1W, 50V, 0.5%	MCR03EZPD3000	ROHM	1608
1	U1	IC	-	Buck DC/DC Converter	BD9G341AEFJ	ROHM	4960
1	C2	Open	-	-	-	-	-



■Bill of Materials (continued)

11. VO=40V, Io=2A, (VIN=60V), Fosc=500kHz

Total Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	10uF	100V, X7S, 20±%	C5750X7S2A106K	TDK	5750
				100V, X7R, ±20%	KRM55TR72A106MH01K	MURATA	6153
1	C3	Ceramic Capacitor	6800pF	50V, X7R, ±10%	GRM188R71H682KA01D	MURATA	1608
1	C4	Ceramic Capacitor	0.10uF	50V, X7R, ±10%	GRM188R71H104KA93D	MURATA	1608
4	C5, C6, C7, C7'	Ceramic Capacitor	10uF	50V, B, ±10%	GRM32EB31H106KA12L	MURATA	3225
1	D2	Diode	-	90V, 6A	RB095B-90TL	ROHM	6595
1	L1	Inductor	33µH	±30%, DCR=84mΩmax, 2.95A	CDRH105RNP-330NC-Q	SUMIDA	10.5 x 10.3
				±20%, DCR=52mΩmax, 4.2A	7447709330	WURTH	12 x 12
				±20%, DCR=94.5mΩmax, 4.0A	IHLP4040DZER330M11	VISHAY	10.3 x 10.3
				±20%, DCR=51.0mΩmax, 3.88A	CLF12577NIT- 330M	TDK	12.5 x 12.5
1	R1	Resistor	100kΩ	0.1W, 50V, 1%	MCR03EZPFX1003	ROHM	1608
1	R2	Resistor	6.2kΩ	0.1W, 50V, 1%	MCR03EZPFX6201	ROHM	1608
1	R3	Resistor	10kΩ	0.1W, 50V, 1%	MCR03EZPFX1002	ROHM	1608
1	R4	Resistor	15kΩ	0.1W, 50V, 1%	MCR03EZPFX1502	ROHM	1608
1	R4(series)	Resistor	1.5kΩ	0.1W, 50V, 1%	MCR03EZPFX1501	ROHM	1608
1	R5	Resistor	39kΩ	0.1W, 50V, 0.5%	MCR03EZPD3902	ROHM	1608
1	R6	Resistor	1kΩ	0.1W, 50V, 0.5%	MCR03EZPD1001	ROHM	1608
1	U1	IC	-	Buck DC/DC Converter	BD9G341AEFJ	ROHM	4960
1	C2	Open	-	-	-	-	-



■ 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

1. 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 (Note 1), 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
CLASSⅢ	CLASSⅢ	CLASSⅡb	CLASSⅢ
CLASSⅣ		CLASSⅢ	

2. 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:
   [a] Installation of protection circuits or other protective devices to improve system safety
   [b] Installation of redundant circuits to reduce the impact of single or multiple circuit failure

3. 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:
   [a] Use of our Products in any types of liquid, including water, oils, chemicals, and organic solvents
   [b] Use of our Products outdoors or in places where the Products are exposed to direct sunlight or dust
   [c] Use of our Products in places where the Products are exposed to sea wind or corrosive gases, including Cl_2, H_2S, NH_3, SO_2, and NO_2
   [d] Use of our Products in places where the Products are exposed to static electricity or electromagnetic waves
   [e] Use of our Products in proximity to heat-producing components, plastic cords, or other flammable items
   [f] Sealing or coating our Products with resin or other coating materials
   [g] 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
   [h] Use of the Products in places subject to dew condensation

4. The Products are not subject to radiation-proof design.

5. Please verify and confirm characteristics of the final or mounted products in using the Products.

6. 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.

7. 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.

8. Confirm that operation temperature is within the specified range described in the product specification.

9. 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

1. When a highly active halogenous (chlorine, bromine, etc.) flux is used, the residue of flux may negatively affect product performance and reliability.

2. 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 Cl2, H2S, NH3, SO2, and NO2
   - [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

QR code 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

1. This document may not be reprinted or reproduced, in whole or in part, without prior written consent of ROHM.

2. The Products may not be disassembled, converted, modified, reproduced or otherwise changed without prior written consent of ROHM.

3. In no event shall you use in any way whatsoever the Products and the related technical information contained in the Products or this document for any military purposes, including but not limited to, the development of mass-destruction weapons.

4. The proper names of companies or products described in this document are trademarks or registered trademarks of ROHM, its affiliated companies or third parties.

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.

3. The information contained in this document is provided on an "as is" basis and ROHM does not warrant that all information contained in this document is accurate and/or error-free. ROHM shall not be in any way responsible or liable for any damages, expenses or losses incurred by you or third parties resulting from inaccuracy or errors of or concerning such information.