

## Non-Isolated Single Output Dc-Dc Converter

### FEATURES:

- OUTPUT CURRENT UP TO 6A
- INPUT RANGE 2.4VDC TO 5.5VDC, 8.3VDC TO 14VDC
- HIGH EFFICIENCY – 94% @5.0Vin 3.3V ,FULL LOAD  
89% @12.0Vin 3.3V FULL LOAD
- INPUT UNDER-VOLTAGE LOCKOUT ● SIP PACKAGES
- COMPLIANT TO RoHS EU DIRECTIVE 2002/95/EC
- SMALL SIZE AND LOW PROFILE : 22.9 X 10.2 X 5mm
- OUTPUT VOLTAGE PROGRAMMABLE FROM 0.75VDC TO 3.3VDC,0.75VDC TO 5VDC VIA EXTERNAL RESISTOR



### APPLICATIONS

- Wireless Network ● Telecom/Datacom ● Distributed Power Architectures
- Industry Control System ● Semiconductor Equipment
- Microprocessor Power Applications

Specifications typical at TA=25°C, nominal input voltage and rated output current unless otherwise specified

Part Number	ON/OFF Logic	Input Voltage	Output Voltage	Output Current		Efficiency (%) 3.3Vdc@6A
				Min. Load	Max. Load	
02D-05-06S	Positive(option) Negative(standard)	2.4 ~ 5.5Vdc Vin(min) = Vo(Set)+0.5	0.75~3.3Vdc	0A	6A	94% @5.0Vin
02D-12-06S		Vo(set)<3.63V Vin=8.3~14Vdc Vo(set)>3.63V Vin=8.3~13.2Vdc	0.75 ~5.0Vdc			89% @12Vin

### Input Specifications

Parameters	Conditions	Min	Typ	Max	Units
Voltage Tolerance	05 Series Vo(set)	2.4	5	5.5	Vdc
	12 Series Vo(set)	8.3	12	14	Vdc
Input Current	Vin=Vin(min); Io=Io(max)			6	A
Input Filter(Note 4)	C filter				
No Load Current	Vo(set)=0.75Vdc		20 @Vin=5		mA
	Vo(set)=0.75Vdc		19 @Vin=12		mA
	Vo(set)=3.3Vdc		45 @Vin=5		mA
	Vo(set)=5.0Vdc		100 @Vin=12		mA
Under Voltage Lockout	Start-up Voltage		2.2@Vin= 5		V
			4.5@Vin=12		V
	Shutdown Voltage		2.0 @Vin=5		V
			3.8 @Vin=12		V

Input reflected ripple current 5~20MHz, 1uH source impedance:35mAp-p

### Output Specifications(1)

Parameters	Conditions	Min	Typ	Max	Units
Output current				6	A
Voltage Tolerance	Full load and Vin(min)			±2	%
Minimum load				0	A
Line Regulation	Vin=Vin(min) to Vin(max)at Full Load		±0.3		%
Load Regulation	No Load to Full Load		±0.5		%
Ripple and noise (Note2)	20MHz bandwidth			60	mVp-p
Temperature coefficient			±0.4		%
Dynamic load response (Note 2)	ΔIo / Δt = 2.5A/uS ,Vin(nom)	Peak deviation	200		mV
	Load change step (50% to 100% or 100% to 50% of Io(max))	Setting time (Vo<10%peak deviation)	25		uS
Dynamic load Response (Note 3)	ΔIo / Δt = 2.5A/uS ,Vin(nom)	Peak deviation	50		mV
	Load change step (50% to 100% or 100% to 50% of Io(max))	Setting time (Vo<10%peak deviation)	50		uS



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Output Specifications(2)					
Output current limit			220		%
Output short-circuit current	Hiccup, automatic recovery				
External load capacitance	ESR $\geq 1\text{m}\Omega$			1000	$\mu\text{F}$
	ESR $\geq 10\text{m}\Omega$			3000	$\mu\text{F}$
Output voltage overshoot-startup	Vin=Vin(min) to Vin(max);F.L.		1		%
Voltage adjustability (see fig.1)	05 Series	0.7525		3.3 @Vin=5	V
	12 Series	0.7525		5.0 @Vin=12	V

General Specifications					
Parameters	Conditions	Min	Typ	Max	Units
Efficiency	See table				
Isolation voltage	None				
Switching Frequency			300		KHz
Dimensions	23.0x10.2x4.9				mm
Weight	2.8				g
MTBF (Note 1)	MIL-HDBK-217F	3.247 x 10 <sup>6</sup>			hrs

ENVIRONMENTAL SPECIFICATIONS					
Parameters	Conditions	Min	Typ	Max	Units
Operating temperature range	with derating	-40		85	$^{\circ}\text{C}$
Storage temperature range		-55		125	$^{\circ}\text{C}$
Thermal shock	MIL-STD-810F				
Over temperature protection			135		$^{\circ}\text{C}$

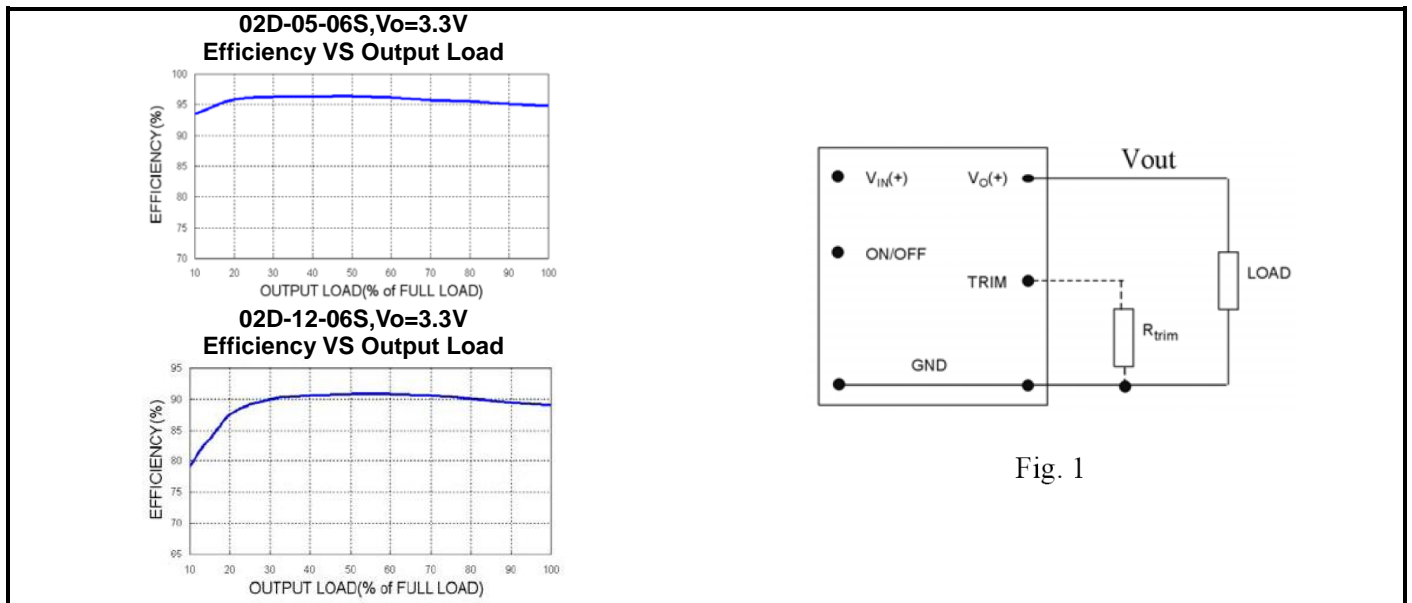
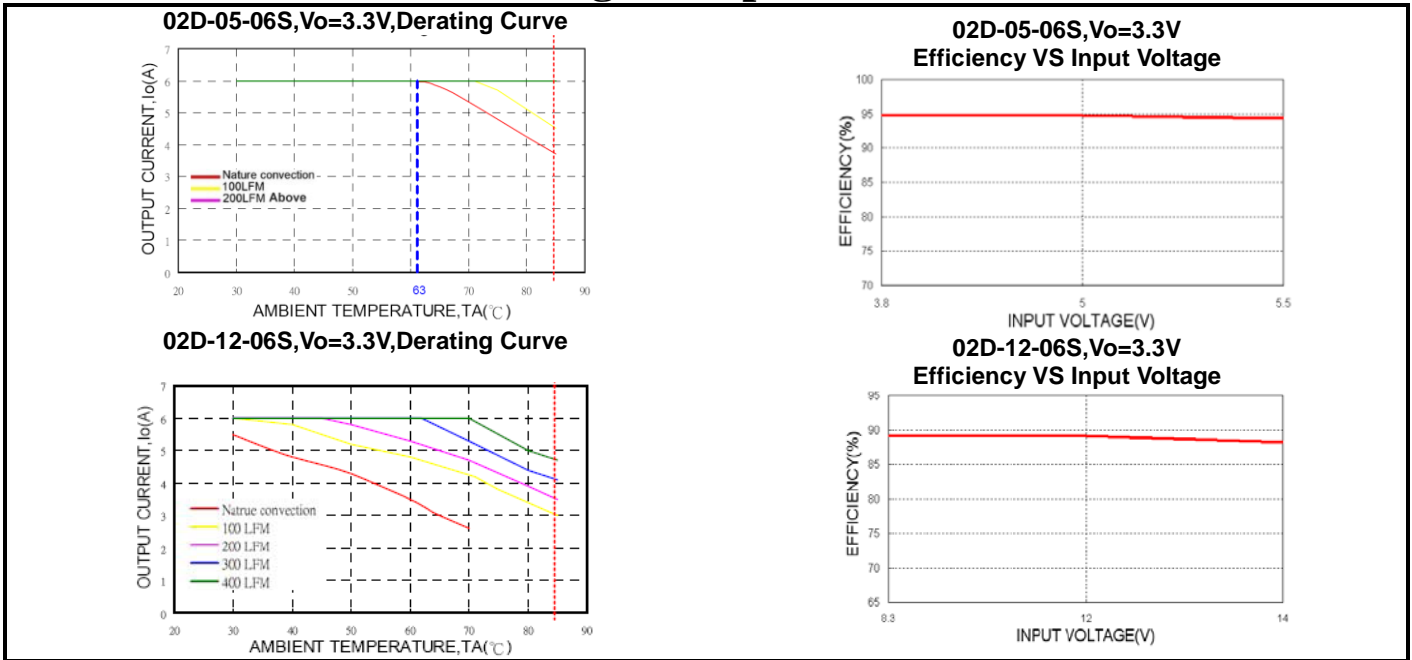
FEATURE SPECIFICATIONS					
Parameters	Conditions	Min	Typ	Max	Units
Remote ON/OFF					
Positive logic(option)	ON=(Vin-4)<Vr<Vin(Max)			10	$\mu\text{A}$
	OFF=0V<Vr<0.3V			1	mA
Negative logic(standard)	ON=0V<Vr<0.3V@I <sub>IN</sub>			10	$\mu\text{A}$
	OFF=1.5V<Vr<Vin(Max)@I <sub>IN</sub>			1	mA
Input current of Remote control pin		0.01		1.0	mA
Remote off state input current Nominal Vin			5		mA
Rise time (Time for Vo to rise from 10% to 90%of Vo(set))				6	ms
Turn-on delay time	Case 1 (Note 5)		3		ms
	Case 2 (Note 6)		3		ms

**Note:**

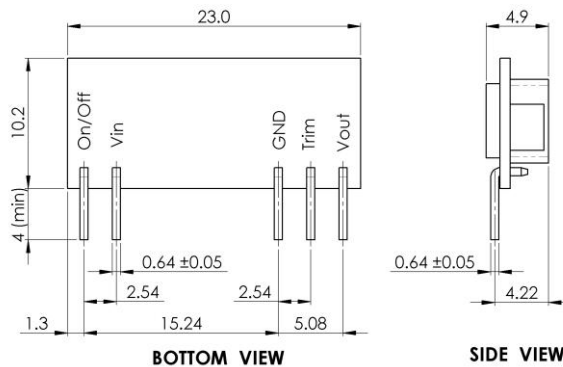
1. MIL-HDBK-217F Notice2 @Ta=25  $^{\circ}\text{C}$ , Full load(Ground, Benign, controlled environment).
2. External with Cout = 1 $\mu\text{F}$  ceramic//10 $\mu\text{F}$  tantalum capacitors.
3. External with Cout = 2x150 $\mu\text{F}$  polymer capacitors.
4. It's necessary to equip the external input capacitors at the input of the module. The capacitors should connect as close as possible to the input terminals that ensuring module stability. The external Cin is 2x150 $\mu\text{F}$  low-ESR polymer capacitors // 2x47 $\mu\text{F}$  ceramic capacitors at least.
5. Case 1 :On/Off input is set to logic low (module on) and then input power is applied (delay from instant at which Vin=Vin(min) until Vo=10% of Vo(set))
6. Case 2 :Input power is applied for at least one second and then the On/Off input is set to logic low (delay from instant at which Von/off=0.3V until Vo=10% of Vo(set))

**CAUTION:** This power module is not internally fused. An input line fuse must always be used.

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**Markings and Dimensions**



Unit : mm  
Tolerance : XX.X ± 0.5 · XX.XX ± 0.25