



## S02D-6A SERIES

### 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

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

Part Number	ON/OFF Logic	Input Range	Output Voltage	Output Current		Efficiency (%) 3.3Vdc @6A
				Min. Load	Max. Load	
S02D-05-06S	Positive (option)	2.4 ~ 5.5Vdc Vin(min) = Vo(Set)+0.5	0.75 ~3.3Vdc	0A	6A	94% @5.0Vin
S02D-12-06S	Negative (standard)	Vo(set) < 3.63V Vin=8.3~14Vdc Vo(set) > 3.63V Vin=8.3~13.2Vdc	0.75 ~5.0Vdc			

### 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	
Input Current	Vin=Vin(min); Io=Io(max)			6	A
Input Filter(Note4)	C filter				
No Load Current	Vo(set)=0.75Vdc		20 @Vin=5		mA
	Vo(set)=0.75Vdc		19 @Vin=12		
	Vo(set)=3.3Vdc		45 @Vin=5		
	Vo(set)=5.0Vdc		100 @Vin=12		
Under Voltage Lockout	Start-up Voltage		2.2@Vin= 5		V
			4.5@Vin=12		
	Shutdown Voltage		2.0 @Vin=5		
			3.8 @Vin=12		

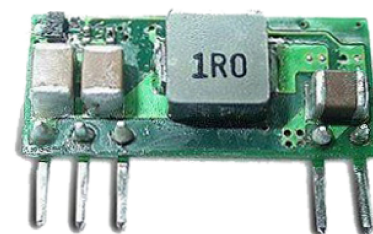
Input reflected ripple current 5~20MHz, 1uH source impedance:35mA<sub>p-p</sub>

Schmid Multitech GmbH

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## DC-DC Converter S02D-6A SERIES

Non-Isolated  
Single Output



### Applications

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

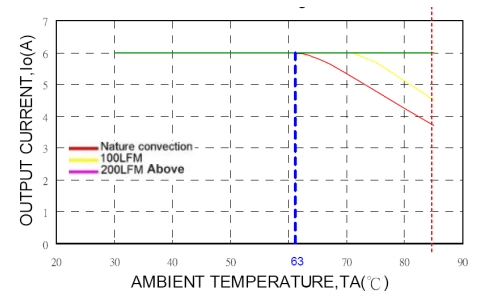
## Output Specifications

Parameters	Conditions	Min	Typ	Max	Units
Output current				6	A
Voltage Tolerance	Full load and $V_{in}(\min)$			$\pm 2$	%
Minimum load				0	A
Line Regulation	$V_{in}=V_{in}(\min)$ to $V_{in}(\max)$ at Full Load		$\pm 0.3$		%
Load Regulation	No Load to Full Load		$\pm 0.5$		%
Ripple & Noise (Note2)	20MHz bandwidth			60	mVp-p
Temperature coefficient			$\pm 0.4$		%
Dynamic load response(Note 2)	$\Delta I_o / \Delta t = 2.5A/\mu S, V_{in}(\text{nom})$	Peak deviation		200	mV
	Load change step (50% to 100% or 100% to 50% of $I_o(\max)$ )	Setting time ( $V_o < 10\%$ peak deviation)		25	$\mu S$
Dynamic load Response(Note 3)	$\Delta I_o / \Delta t = 2.5A/\mu S, V_{in}(\text{nom})$	Peak deviation		50	mV
	Load change step (50% to 100% or 100% to 50% of $I_o(\max)$ )	Setting time ( $V_o < 10\%$ peak deviation)		50	$\mu S$
Output current limit			220		
Output short-circuit current	Hiccup, automatic recovery				
External load capacitance	$ESR \geq 1m\Omega$			1000	$\mu F$
	$ESR \geq 10m\Omega$			3000	$\mu F$
Output voltage overshoot-startup	$V_{in}=V_{in}(\min)$ to $V_{in}(\max)$ ;F.L		1		%
Voltage adjustability (see fig.1)	05 Series	0.7525		3.3 @ $V_{in}=5$	V
	12 Series	0.7525		5.0 @ $V_{in}=12$	V

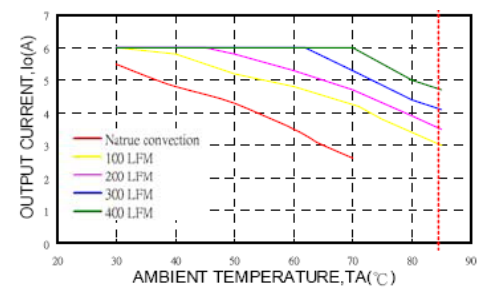
## General Specifications

Parameters	Conditions	Min	Typ	Max	Units
Switching Frequency			300		KHz
Isolation voltage			None		
Efficiency			See table		
Dimensions			23.0x10.2x4.9		mm
Weight			2.8		g
MTBF (Note 1)	MIL-HDBK-217F		$3.247 \times 10^6$		hrs

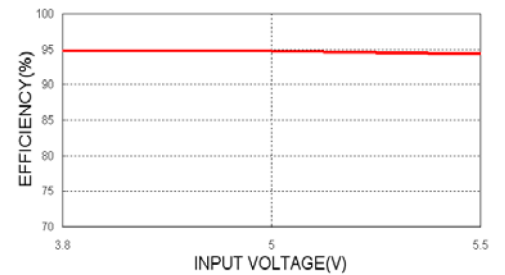
## S02D-05-06S, $V_o=3.3V$ , Derating Curve



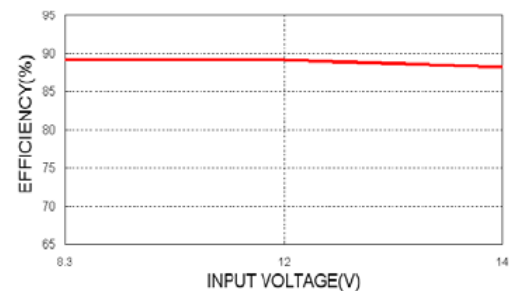
## S02D-12-06S, $V_o=3.3V$ , Derating Curve



## S02D-05-06S, $V_o=3.3V$ Efficiency VS Input Voltage



## S02D-12-06S, $V_o=3.3V$ Efficiency VS Input Voltage



## Environmental Specifications

Parameters	Conditions	Min	Typ	Max	Units
Operating temperature range	with derating	-40		85	°C
Storage temperature range	With derating	-55		125	°C
Thermal shock		MIL-STD-810F			
Over temperature protection			135		°C

## Feature Specifications

Parameters	Conditions	Min	Typ	Max	Units
Remote ON/OFF					
Positive logic(option)	ON=(Vin-4)<Vr<Vin(Max)			10	uA
	OFF=0V<Vr<0.3V			1	mA
Negative logic(standard)	ON=0V<Vr<0.3V@I <sub>IN</sub>			10	uA
	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

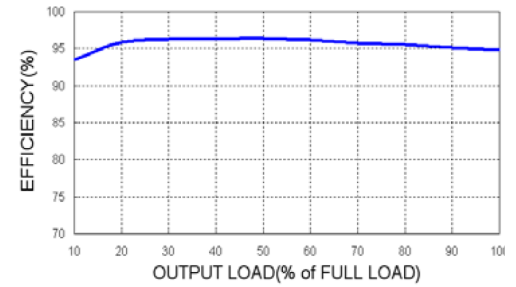
## Note :

- MIL-HDBK-217F Notice2 @Ta=25 °C, Full load(Ground, Benign, controlled environment).
- External with Cout = 1uF ceramic//10uF tantalum capacitors.
- External with Cout = 2×150uF polymer capacitors.
- 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 2×150μF low-ESR polymer capacitors // 2×47μF ceramic capacitors at least.
- 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))
- 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))

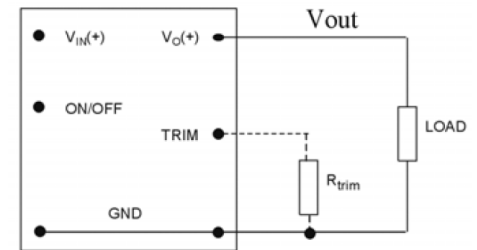
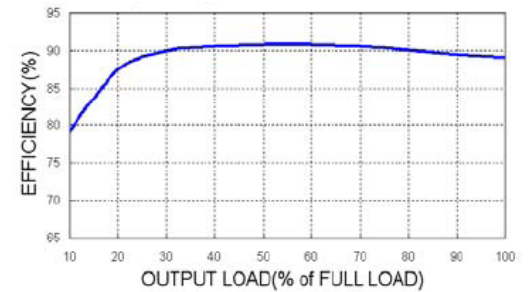
## CAUTION :

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

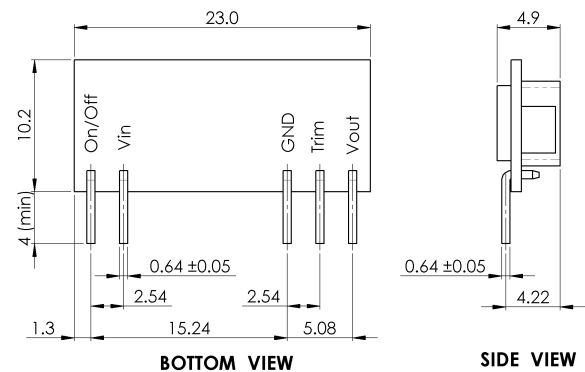
## S02D-05-06S,Vo=3.3V Efficiency VS Output Load



## S02D-12-06S,Vo=3.3V Efficiency VS Output Load



## Markings and Dimensions



BOTTOM VIEW

SIDE VIEW

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