

SI-8000JF Series

Full-Mold, Separate Excitation Switching Type

■Features

- Compact full-mold package (equivalent to TO220)
- Output current: 1.5 A
- High efficiency: 79 to 91%
- Requires only 4 external components
- Phase correction and output voltage adjustment performed internally
- Choke coil size can be reduced through the employment of high frequency (125 kHz) design
- Built-in foldback overcurrent protection, thermal protection circuits
- Output ON/OFF capable (OFF state current consumption: 200 μ A max.)
- Soft start possible via ON/OFF pin



■Applications

- Power supplies for telecommunication equipment
- Onboard local power supplies

■Lineup

Part Number	SI-8015JF	SI-8025JF	SI-8033JF	SI-8050JF	SI-8090JF	SI-8120JF
V_o (V)	1.59	2.5	3.3	5.0	9.0	12.0
I_o (A)	1.5					

■Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
DC Input Voltage	V_{IN}	43	V
Power Dissipation	P_{D1}	16.6 (with infinite heatsink)	W
	P_{D2}	1.5 (without heatsink, standalone operation)	W
Junction Temperature	T_j	+125	°C
Storage Temperature	T_{stg}	-40 to +125	°C
Thermal Resistance (Junction to Case)	$R_{th(j-c)}$	6.0	°C/W

■Recommended Operating Conditions

Parameter	Symbol	Ratings						Unit	Conditions
		SI-8015JF*	SI-8025JF	SI-8033JF	SI-8050JF	SI-8090JF	SI-8120JF		
DC Input Voltage Range	V_{IN1}	V_o+2 to V_o+3	4.5 to 5.5	5.3 to 6.3	7 to 8	11 to 12	14 to 15	V	$I_o=0$ to 1A
	V_{IN2}	V_o+3 to 40	5.5 to 40	6.3 to 40	8 to 40	12 to 40	15 to 40	V	$I_o=0$ to 1.5A
Output Current Range	I_o	0 to 1.5						A	$V_{IN} \geq V_o+3V$
Operating Junction Temperature Range	T_{jop}	-30 to +125						°C	

*SI-8015JF is a variable output voltage type. The variable output voltage range is from 2.5 V to 24 V.

Electrical Characteristics

(Ta=25°C)

Parameter		Symbol	Rating																		Unit
			SI-8015JF			SI-8025JF			SI-8033JF			SI-8050JF			SI-8090JF			SI-8120JF			
			min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	
Output Voltage*1		Vo*2	1.558	1.59	1.622	2.45	2.50	2.55	3.234	3.30	3.366	4.90	5.00	5.10	8.82	9.00	9.18	11.76	12.00	12.24	V
		Conditions	VIN=12V, Io=0.5A			VIN=12V, Io=0.5A			VIN=15V, Io=0.5A			VIN=20V, Io=0.5A			VIN=21V, Io=0.5A			VIN=24V, Io=0.5A			
Efficiency		η		67			74			77			82			86			88		%
		Conditions	VIN=12V, Io=0.5A			VIN=12V, Io=0.5A			VIN=15V, Io=0.5A			VIN=20V, Io=0.5A			VIN=21V, Io=0.5A			VIN=24V, Io=0.5A			
Switching Frequency		f		125			125			125			125			125			125		kHz
		Conditions	VIN=12V, Io=0.5A			VIN=12V, Io=0.5A			VIN=15V, Io=0.5A			VIN=20V, Io=0.5A			VIN=21V, Io=0.5A			VIN=24V, Io=0.5A			
Line Regulation		ΔVOLINE		25	80		25	80		25	80		40	100		50	120		60	130	mV
		Conditions	VIN=8 to 30V, Io=0.5A			VIN=7 to 30V, Io=0.5A			VIN=8 to 30V, Io=1.0A			VIN=10 to 30V, Io=1.0A			VIN=15 to 30V, Io=1.0A			VIN=18 to 30V, Io=1.0A			
Load Regulation		ΔVOLOAD		10	30		10	30		10	30		10	40		10	40		10	40	mV
		Conditions	VIN=12V, Io=0.2 to 0.8A			VIN=12V, Io=0.2 to 0.8A			VIN=15V, Io=0.5 to 1.5A			VIN=20V, Io=0.5 to 1.5A			VIN=21V, Io=0.5 to 1.5A			VIN=24V, Io=0.5 to 1.5A			
Temperature Coefficient of Output Voltage*3		ΔVo/ΔTa*4		±0.5			±0.5			±1.0			±1.0								mV/°C
Overcurrent Protection Starting Current		Is1	1.6			1.6			1.6			1.6			1.6			1.6			A
		Conditions	VIN=12V			VIN=12V			VIN=15V			VIN=20V			VIN=21V			VIN=24V			
ON/OFF*5 Terminal	Low Level Voltage	VSSL			0.5			0.5			0.5			0.5			0.5			0.5	V
	Leak Current at Low Voltage	ISSL			100			100			100			100			100			100	μA
	Conditions	VSSL=0V			VSSL=0V			VSSL=0V			VSSL=0V			VSSL=0V			VSSL=0V				
Quiescent Circuit Current		Iq		7			7			7			7			7			7		mA
		Conditions	VIN=12V, Io=0A			VIN=12V, Io=0A			VIN=15V, Io=0A			VIN=20V, Io=0A			VIN=21V, Io=0A			VIN=24V, Io=0A			
		Iq(off)			200			200			200			200			200			200	μA
		Conditions	VIN=12V, VON/OFF=0.3V			VIN=12V, VON/OFF=0.3V			VIN=15V, VON/OFF=0.3V			VIN=20V, VON/OFF=0.3V			VIN=21V, VON/OFF=0.3V			VIN=24V, VON/OFF=0.3V			

*1: Reference voltage for SI-8015JF

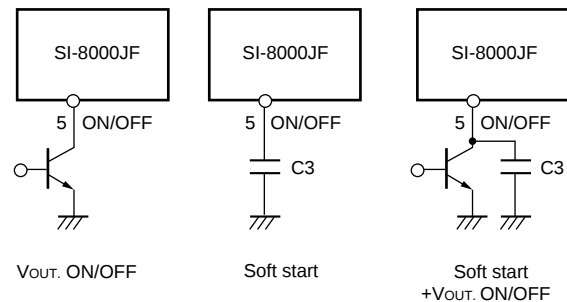
*3: Reference voltage temperature coefficient for SI-8015JF

*2: VREF for SI-8015JF

*4: $\Delta V_{REF}/\Delta T_a$ for SI-8015JF

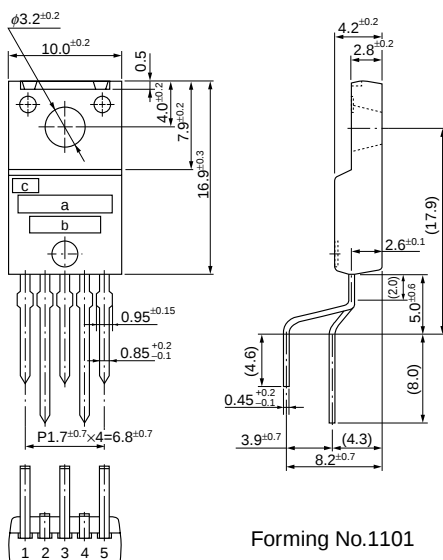
*5: Pin 5 is the ON/OFF pin. Connecting a capacitor to this pin enables the soft start function. By using this pin, the output can also be turned on or off.

To stop output, set the ON/OFF pin voltage to VSSL or less. To switch the potential of the ON/OFF pin, drive the open collector of the transistor, etc. When SI-8000JF is started using the ON/OFF pin, take appropriate action such as limiting the current for a large-capacity C3 because a discharge current flows to the ON/OFF control transistor from C3. The ON/OFF pin is pulled up to the power supply in the IC, so no external voltage can be applied. If this pin is not used, leave it open.



External Dimensions

(Unit : mm)



- a. Part Number
- b. Lot Number
- c. Logo Mark

Pin Arrangement

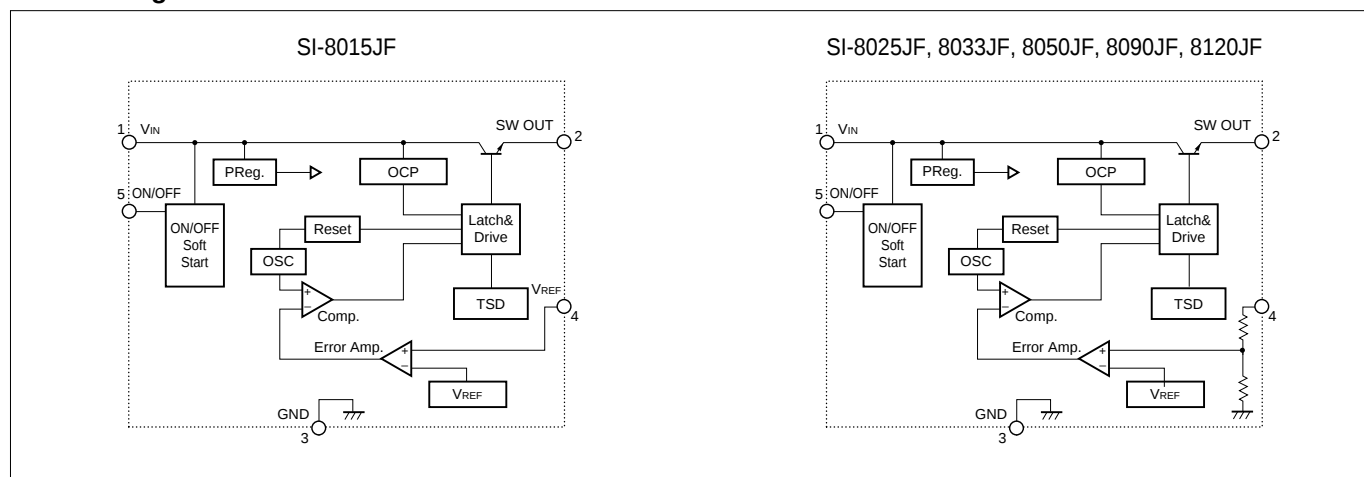
- ① VIN
- ② SWOUT
- ③ GND
- ④ Vos
- ⑤ ON/OFF

Plastic Mold Package Type

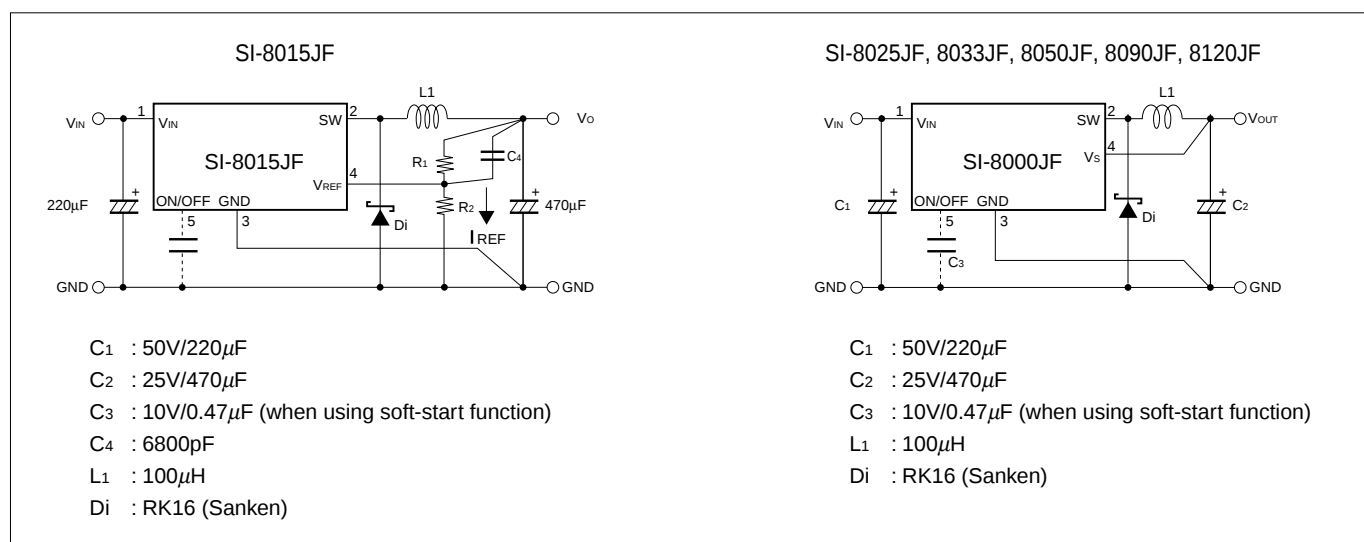
Flammability: UL94V-0

Weight: Approx. 2.3g

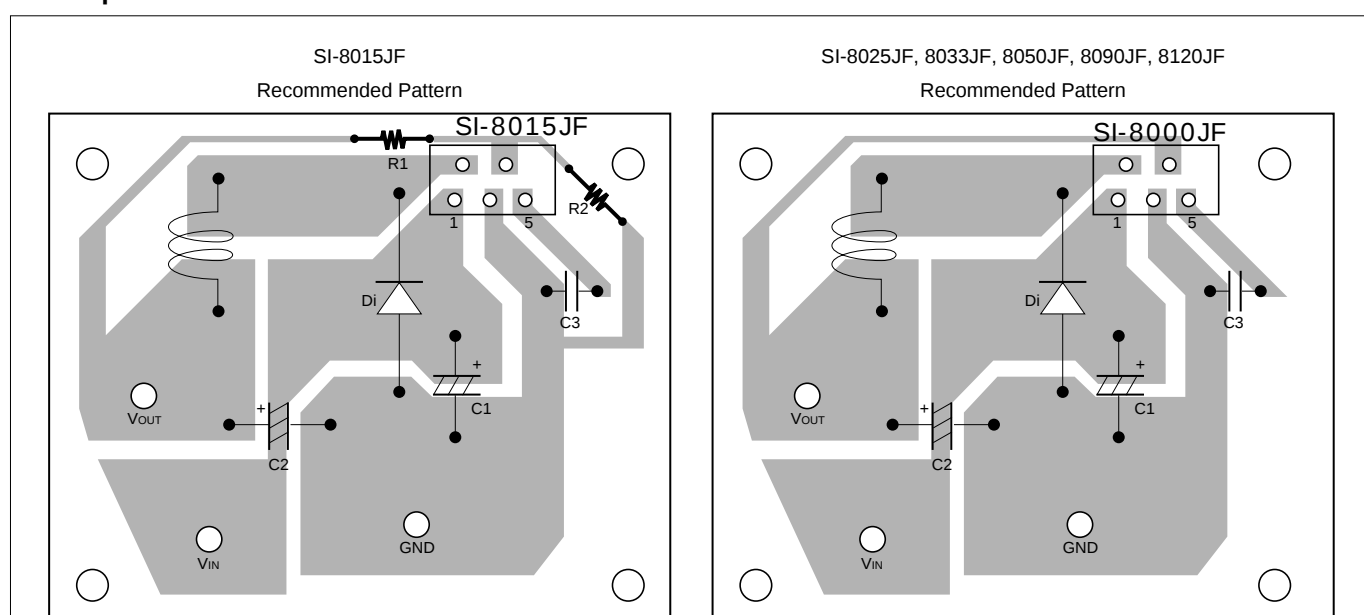
■Block Diagram



■Standard External Circuit

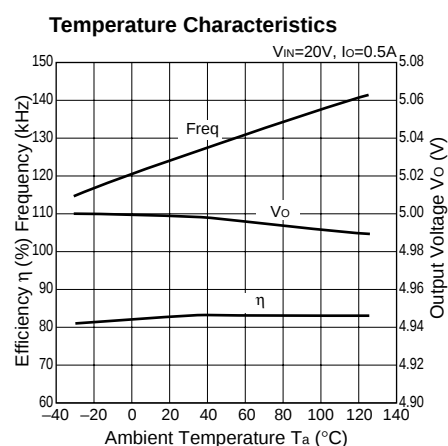
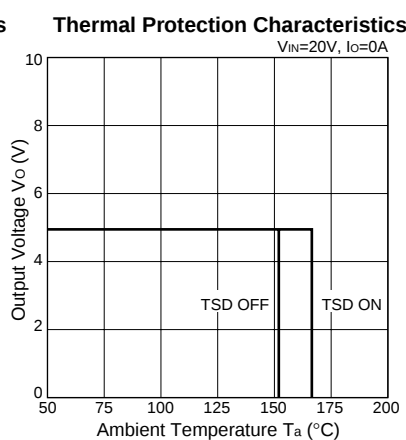
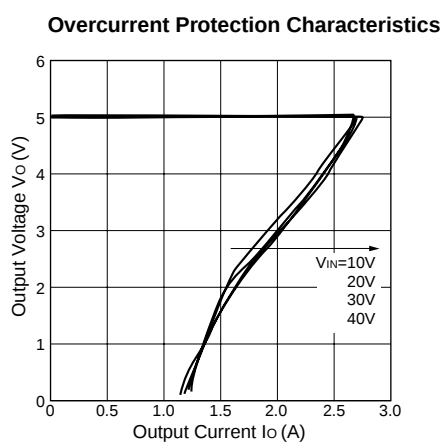
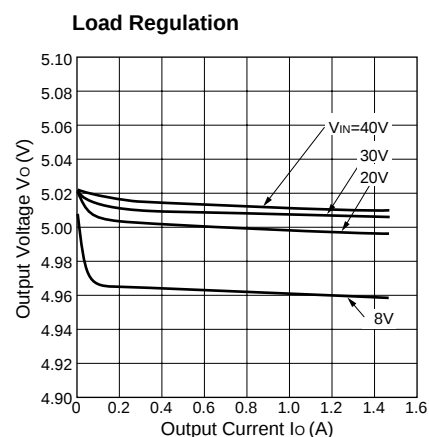
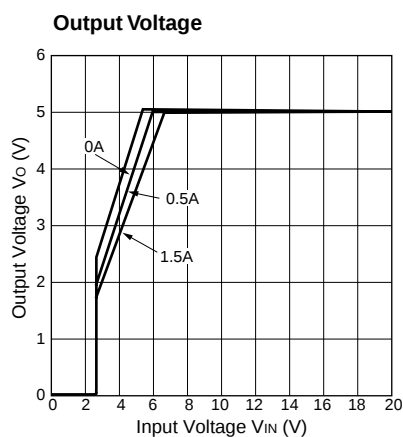
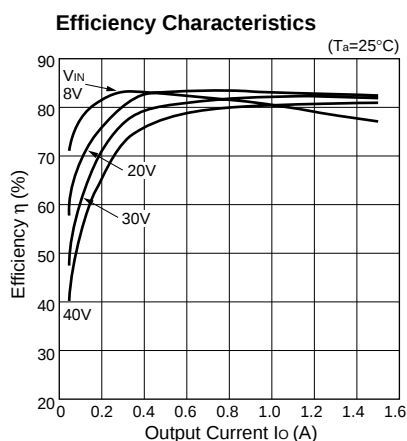


■Example of Pattern on PC Board

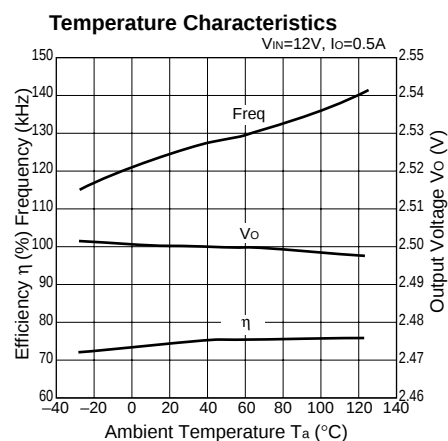
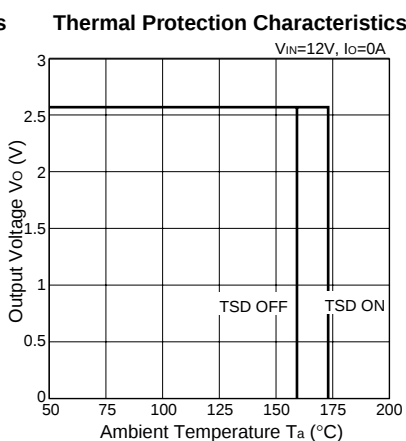
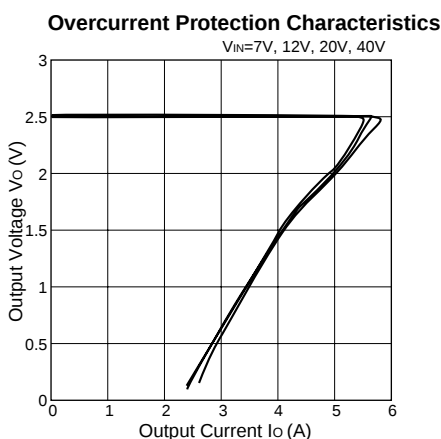
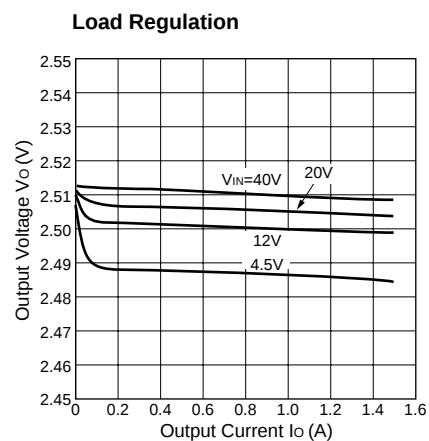
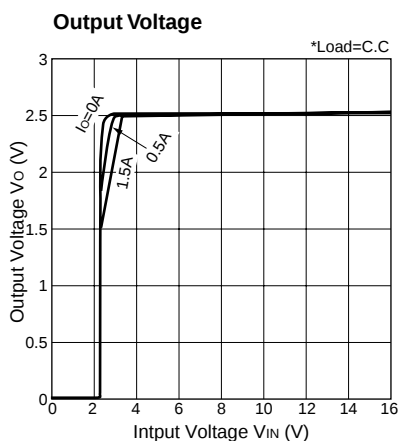
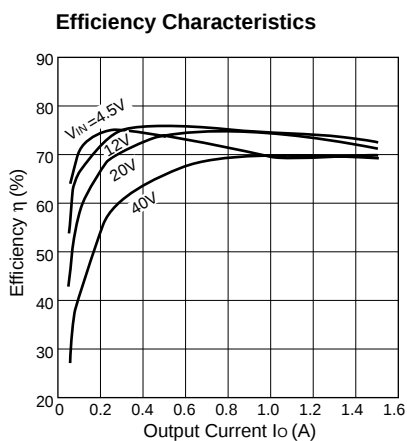


* For the optimum operating conditions, use one-point GND wiring centering on pin 3, and place each component as closely as possible.

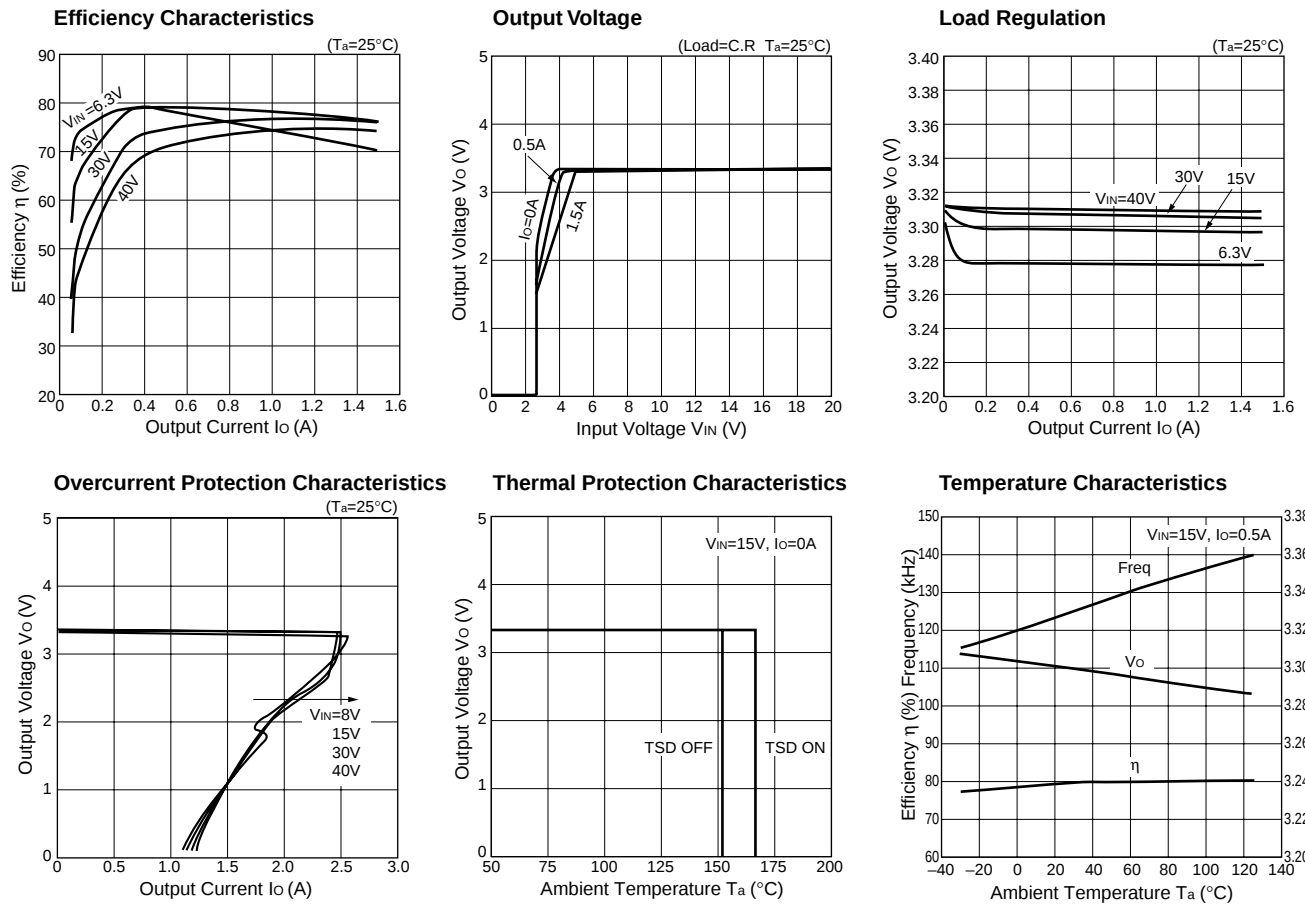
■Typical characteristics (SI-8015JF) ($V_o=5V$)



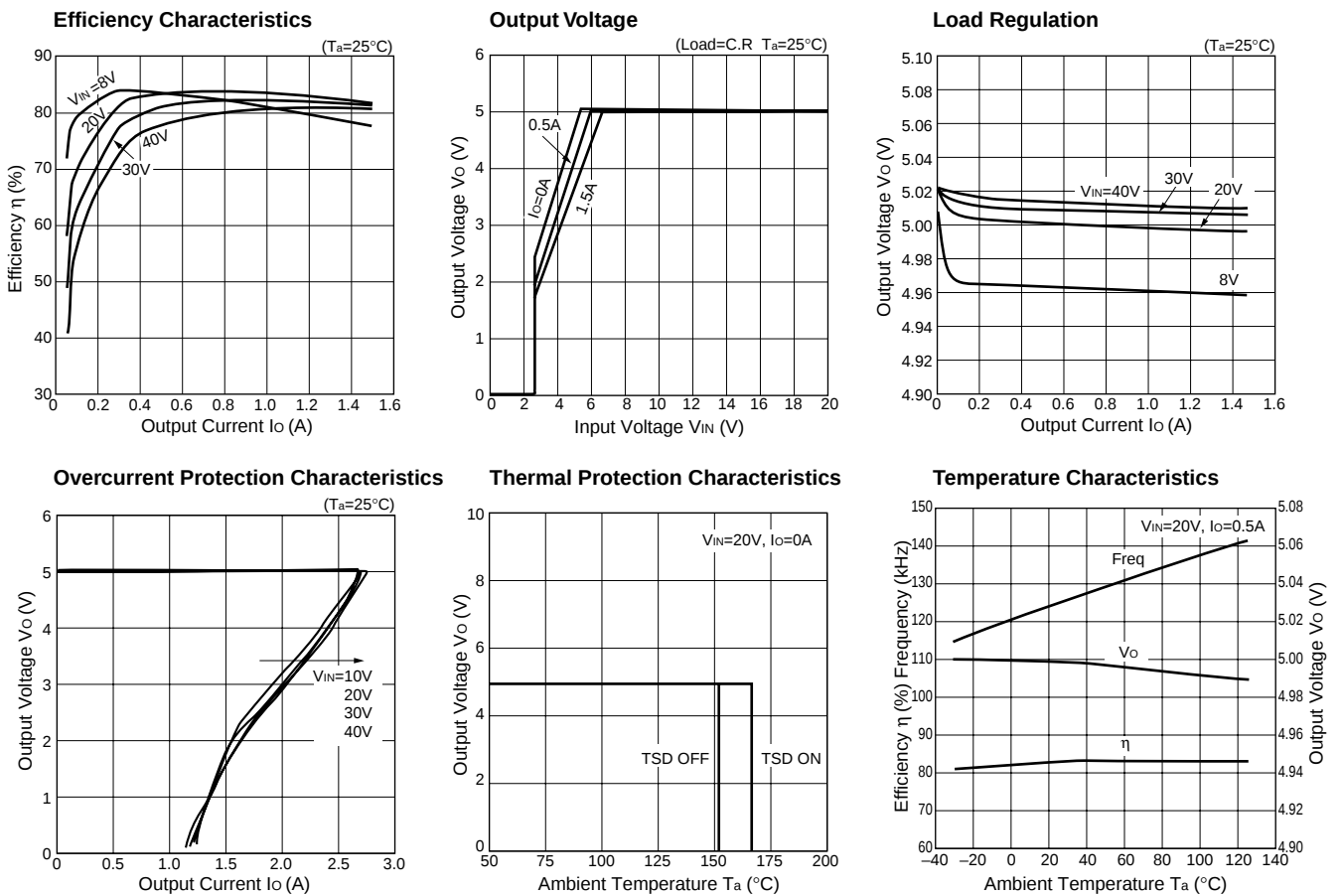
■Typical characteristics (SI-8025JF)



■Typical characteristics (SI-8033JF)



■Typical characteristics (SI-8050JF)



■Typical characteristics (SI-8090JF)

