REGISTER MAP

Register	Name	Description	Default Value
0C	PVin_report[7:0]	PVin=decimal(Reg0x0C[7:0])/16	
0D	Vout_report[7:0]	Vout=decimal(Reg0x0D[7:0])×0.02+0.6, for Vout>1.8, Vout=decimal(Reg0x0D[7:0])×0.01+0.3, otherwise	
0E	Iout_report[7:0]	Iout=decimal(Reg0x0E[7:0])/32, for all devices in FS160X except FS1606-0600 Iout=decimal(Reg0x0E[7:0])/32-(9.05-0.24×decimal(Reg0x1A[7:2])) ×Vout-0.356×decimal(Reg0x1A[7:2])+13.1, for FS1606-0600	
0F	Temp_report[7:0]	Temperature=decimal(Reg0x0F[7:0])	
10	Reserved[7:0]		
11	Reserved[7:0]		
12	Reserved[7:1]		
	Vout_high_byte[0]	Set up 9-bit DAC. Atomic write-protected. So both high byte and low byte have to be written in order to have the value take effect.	
13	Vout_low_byte [7:0]		
14	Reserved[7:4]		
	SS_rate[3]	0: 0.5mV/µs, 1: 1mV/µs	‘b0
	SoftStopEnable[2]	0: disable; 1: enable	‘b0
	Reserved[1]		
	PGControl[0]	0: DAC-based, 1: threshold-based	‘b1
15	Reserved[7:3]		
	OCSet[2:0]	Sets the OCP level for 160X family	‘b000: FS1603, ‘b001: FS1604, ‘b010: FS1606
16	Base_address[7:0]		‘h08
17	Reserved[7:2]		
	OV threshold[1:0]	0: 105, 1: 110, 2: 115, 3: 120	‘b11
18	Reserved[7:2]		
	PG_threshold[1:0]	0: 80, 1: 85, 2: 90, 3: 95	‘b10
19	Current_report_offset[7:2]		
	OT_threshold[1:0]	Sets the OTP Threshold, 0: 75, 1: 85, 2: 125, 3: 145	‘b11
1A	Reserved [7:2]		
	Bus_voltage_sel[1]	0: 1.8–2.5V, 1: 3.3–5V	‘b0
	OV_response[0]	0:latched, 1:unlatched	‘b0
1B	Reserved[7:0]		

Register	Name	Description	Default Value
1C	Reserved[7]		
	Unused[6]		
	Unused[5]		
	Reserved[4]		
	Soft_Disable[3]	0: Soft Enable 1: Soft disable	'b0
	Unused[2:0]		
1D	Reserved[7:3]		
	Reserved[2]		
	OTP_clock_on[1]	1: enable OTP burn (turn on OTP clock)	'b1
	Vout_max_high[0]		'b1
1E	Vout_max_low[7:0]		'hC8
20	Unused[7:6]		
	User_pointer [5:3]	Read the index of last user bank burned	
	Trim_pointer [2:0]	Read the index of last trim bank burned	
21	Status_pgood[7]	Not sticky, reflects real-time PG status	
	Status_ovp[6]		
	Status_ocp[5]		
	Status_otp[4]		
	Status_enable[3]	Not sticky, reflects real-time Enable status	
	Status_ncl[2]		
	Clear_status_indicate[1]		
	Status_otp_burn[0]		
22	Fb_report[7:0]	READ_ONLY	
23	Adc_out_vout_lower[7:0]	READ_ONLY	
24	Adc_out_vout_upper[7:0]	READ_ONLY	
25	Adc_out_iout_lower[7:0]	READ_ONLY	
26	Adc_out_iout_upper[7:0]	READ_ONLY	
27	Adc_out_pvin_lower[7:0]	READ_ONLY	
28	Adc_out_pvin_upper[7:0]	READ_ONLY	
29	Adc_out_temp_lower[7:0]	READ_ONLY	
2A	Adc_out_temp_upper[7:0]	READ_ONLY	
2B	OTP_burn[7:0]	OTP to be burned when this register is 0x15 AND OTP_clock_on[0]=1	

Notes:

For soft stop, set Reg 0x1C bit [3] to 0 and toggle Reg 0x14 bit [2]

Modifying reserved bits may lead to erratic operation and/or damage

PROGRAMMING INSTRUCTIONS:

1) Once all registers are written to desired values, save all the values from Reg 0x12 to reg 0x2B into a configuration file as (register, data) pairs
2) Read Reg 0x20

Reg 0x20	Number of writes left to OTP
0x00	4
0x09	3
0x12	2
0x1B	1
0x24	0

3) Apply 7.5V+/-0.25V to Vin pin
4) If number of writes left > 0, write 0x15 to Reg 0x2B and then read reg 0x21. If bit [0] is 1, the write to OTP succeeded. If this bit is 0, the write failed.
5) If successful, cycle Vin.
6) Verify step:

   Read registers from 0x12 to 0x1E, compare with the values in configuration file, and verify that they match
7) If steps 4 or 6 fail, retry steps 1 to 5.
8) If steps 4 or 6 fail again, discard part and debug.

CLOSED LOOP VOUT TRIM:

Scale=1 for FS1606, Vout ≤ 1.8V. Scale=2 for FS1606 >1.8 V, and for FS1603, FS1604.

1) Vout_target_code_ideal=(Vout_target-0.4*scale)/(0.005*scale)
2) Measure Vout
3) Vout_err=Vout_target-Vout
4) Vout_err_code=Vout_err/(0.005*scale)
5) Vout_target_code_adj=Vout_target_code_ideal+Vout_err_code
6) Measure Vout, and adjust code until Vout=Vout_target+/-0.0025*scale

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0.3	07-03-2024	Added Default Values Column	Apoorv Yadav