Tyco/Electronics
Raychem Circuit Protection
308 Constitution Drive
Menlo Park, CA 94025-1164
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PolySwitch®
Power Switch
Devices

PRODUCT: RYC8220-2M

DOCUMENT: SCD24596
PCN: 563577-000
REV LETTER: C
REV DATE: AUGUST 2, 2001
PAGE NO.: 1 OF 2

Specification Status: Released

ABSOLUTE MAXIMUM RATINGS (Note 1)

Parameter	Symbol	Value	Units
Max supply voltage	V_{IN}	+8	V
Fault flag voltage	V_{FLG}	+8	V
Fault flag current	I_{FLG}	50	μA
Output voltage	V_{OUT}	+8	V
Output current	I_{OUT}	Internally limited	A
Control input	V_{EN}	− 0.3 to +12.0	V
Storage temperature	T_S	− 65 to +150	°C
Max lead temperature during soldering (5 sec.)		260	°C

OPERATING RATINGS (Note 3)

Parameter	Symbol	Value	Units
Supply voltage	V_{IN}	+3 to +5.5	V
Continuous output current (each output)	I_{OUT}	0.6	A
Ambient operating temperature	T_A	-40 to +85	°C
Thermal resistance (SO-8)	$\theta\,J_A$	120	°C/W

ELECTRICAL CHARACTERISTICS (V_{IN} = +5V; T_A = 25°C; unless noted.)

Power switch	Condition	Min	Typ	Max	Units
Switch Resistance	V_{IN} = 5V, I_{OUT} = 500mA, each switch		95	120	mΩ
	V_{IN} = 3.3V, I_{OUT} = 500mA, each switch		90	110	mΩ
Output Turn-On Time	R_L = 10Ω each output, consists of delay+rise time		3.6	12	ms
Output Turn-Off Time	R_L = 10Ω each output, consists of delay+fall time		2	40	μs

Current limit	Condition	Min	Typ	Max	Units
Short-Circuit Current Limit	Each output (enable into 0Ω load)	0.6	0.9	1.25	A
	Each output (3Ω load hot-plugged into EN device), V_{OUT} = 4.0V	0.6	0.9	1.25	A

Enable input	Condition	Min	Typ	Max	Units
Enable Input Threshold	Low-to-high transition		1.5	2.4	V
	High-to-low transition, Note 4	0.8	1.5		V
Enable Input Current	V_{EN} = 0V to 5.5V		0.01	1	μA
Enable Input Capacitance				5	pF

Supply current	Condition	Min	Typ	Max	Units
Supply Current	Switch off, OUT = open; Note 4		0.5	5	μA
	Switches on, OUT = open; Note 4		200	250	μA
Output Leakage Current	Each output (output disabled)			10	μA

OT, UVLO/OVLO	Condition	Min	Typ	Max	Units
Overtemperature Shutdown Threshold	T_J increasing		135		C
	T_J decreasing		125		C
UVLO Threshold	V_{IN} = increasing		2.5		V
	V_{IN} = decreasing		2.3		V
OVLO Threshold	V_{IN} = increasing		6.4		V
	V_{IN} = decreasing		6.1		V

Error flag	Condition	Min	Typ	Max	Units
Error Flag Output Resistance	V_{IN} = 5V, I_L = 10μA, Note 5		50	100	Ω
	V_{IN} = 3.3V, I_L = 10μA, Note 5		80	100	Ω
Error flag output delay	Fault on overcurrent, Note 6	6	9	15	ms
Error Flag Off Current	V_{FLAG} = 5V		0.01	1	μA

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ELECTRICAL CHARACTERISTICS - NOTES

Note 1. Exceeding the absolute maximum rating may damage the device.
Note 2. Devices are ESD sensitive. Handling precautions recommended.
Note 3. The device is not designed to function outside its operating rating.
Note 4. Off is $\leq$ 0.8V and on is $\geq$ 2.4V for the RYC8220-1 and RYC8220-3. Off is $\geq$ 2.4V and on is $\leq$ 0.8V for the RYC8220-2 and RYC8220-4. The enable input has approximately 200mV of hysteresis. Pull-down/Pull-up resistors are on chip for "-1" and "-2" configurations.
Note 5. Pull-up resistors are on chip.
Note6. No error flag out delay on UVLO, OVLO and thermal shutdown.

PIN CONFIGURATION:
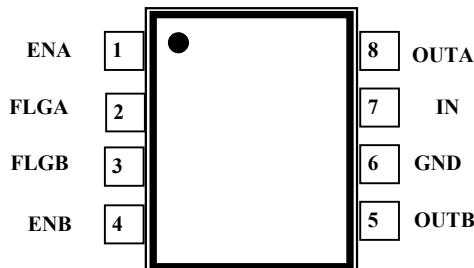
DEVICE MARKING:
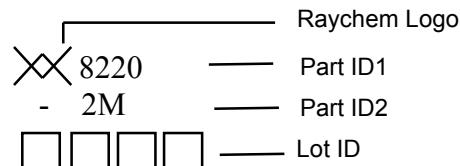
PIN DESCRIPTIONS:

Pin Number	Pin Name	Pin Function
1, 4	EN	Enable (Input): Logic-compatible enables input. High input > 2.4V. Low input <0.8V (-1, -3 active high, -2, -4 active low). Do not float.
2, 3	FLG	Fault Flag (Output): Active-low open-drain output. Indicates overcurrent, UVLO, OVLO and thermal shutdown.
6	GND	Ground: Supply return
7	IN	Supply Input: Output MOSFET drain. Also supplies IC's internal circuitry. Connect to positive supply.
5 and 8	OUT	Switch Output: Output MOSFET source. Typically connect to switched side of load.

MECHANICAL DIMENSIONS:
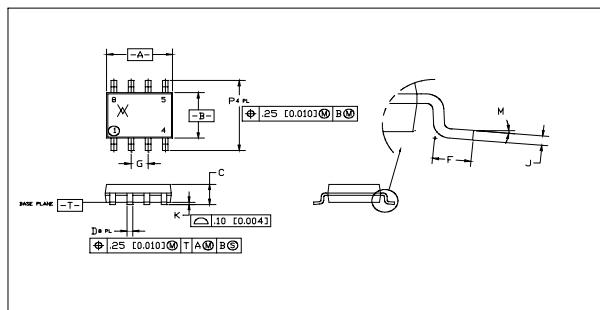
DIMENSION	MIN mm	MAX mm	*MIN* *inch*	*MAX* *inch*
A	4.80	5.00	*0.190*	*0.197*
B	3.80	4.00	*0.150*	*0.157*
C	1.35	1.75	*0.054*	*0.068*
D	0.35	0.49	*0.013*	*0.020*
F	0.40	1.27	*0.016*	*0.050*
G	1.27 BSC		*0.050 BSC*	
J	0.18	0.25	*0.0075*	*0.010*
K	0.10	0.25	*0.004*	*0.010*
M	0°	8°	*0°*	*8°*
P	5.80	6.20	*0.228*	*0.244*