

Tyco/Electronics
Raychem Circuit Protection
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PolySwitch® Power Switch Devices

PRODUCT: RYC8220-3M

DOCUMENT: SCD24675
 PCN: 189723-000
 REV LETTER: B
 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	$^{\circ}C$
Max lead temperature during soldering (5 sec.)		260	$^{\circ}C$

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	$^{\circ}C$
Thermal resistance (SO-8)	θ_{JA}	120	$^{\circ}C/W$

ELECTRICAL CHARACTERISTICS ($V_{IN} = +5V$; $T_A = 25^{\circ}C$; unless noted.)

Power switch	Condition	Min	Typ	Max	Units
Switch Resistance	$V_{IN} = 5V$, $I_{OUT} = 500mA$, each switch		95	120	$m\Omega$
	$V_{IN} = 3.3V$, $I_{OUT} = 500mA$, each switch		90	110	$m\Omega$
Output Turn-On Time	$R_L = 10\Omega$ each output, consists of delay+rise time		3.6	12	ms
Output Turn-Off Time	$R_L = 10\Omega$ 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		$^{\circ}C$
	T_J decreasing		125		$^{\circ}C$
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	$V_{IN} = 5V$, $I_L = 10\mu A$, Note 5		50	100	Ω
	$V_{IN} = 3.3V$, $I_L = 10\mu A$, 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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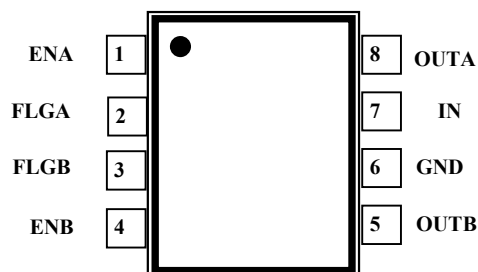
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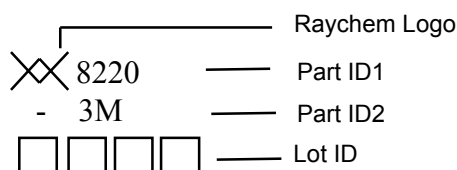
ELECTRICAL CHARACTERISTICS - NOTES

- 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.
Note 6. No error flag out delay on UVLO, OVLO and thermal shutdown.

PIN CONFIGURATION:

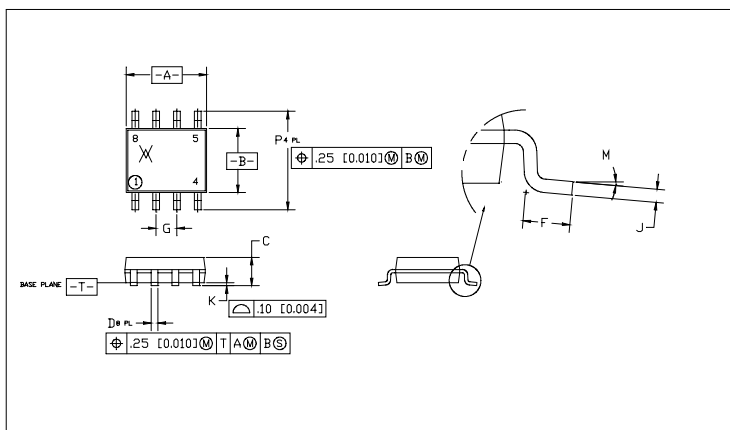


DEVICE MARKING:



PIN DESCRIPTIONS:

Pin Number	Pin Name	Pin Function
1, 4	EN	Enable (Input): Logic-compatible enable 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.



	MIN	MAX	MIN	MAX
DIMENSION	mm	mm	inch	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

MECHANICAL DIMENSIONS:

SO-8 PACKAGE NOTES:

- Dimensions and tolerance per ANSI Y14.5M-1982.
- Dimensions A and B are datums and T is a datum surface.
- Controlling dimensions: Millimeters
- Dimension A and B do not include mold flash. Mold flash shall not exceed 0.15mm [0.006] per side.
- Dimension D does not include interlead flash. Interlead flash shall not exceed 0.25 mm [0.010].