

M62203FP

3.3 V, 2.7 V Two-Channel Fixed-Output General-Purpose DC-DC Converter

REJ03F0094-0100Z

Rev.1.0

Sep.19.2003

Description

The M62203FP is an integrated circuit developed as a two-channel (3.3 V and 2.7 V) fixed-output general-purpose DC-DC converter.

Peripheral elements are incorporated in a small 8-pin package, enabling peripheral circuitry to be simplified, and compact, low-cost set design to be achieved.

In addition, the M62203FP has an on-chip reset circuit that monitors power supply voltage VCC (5 V) and output voltage Vout (3.3 V), enabling erroneous system operation to be prevented.

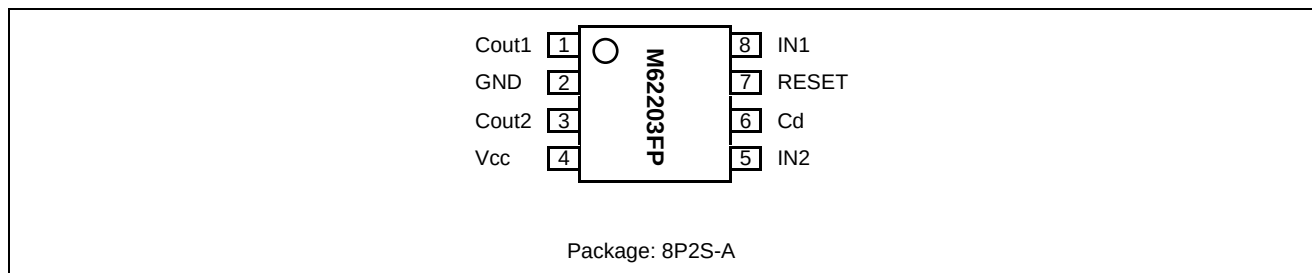
Features

- Wide operating power supply voltage range: 4 to 15 V (5 V Typ.)
- Low current dissipation: 1.0 mA (VCC = 5 V, no load)
- On-chip 5 V, 3.3 V dual voltage system detection reset circuitry
- On-chip oscillation circuit not requiring peripheral elements (110 kHz Typ.)
- 8-pin SOP package

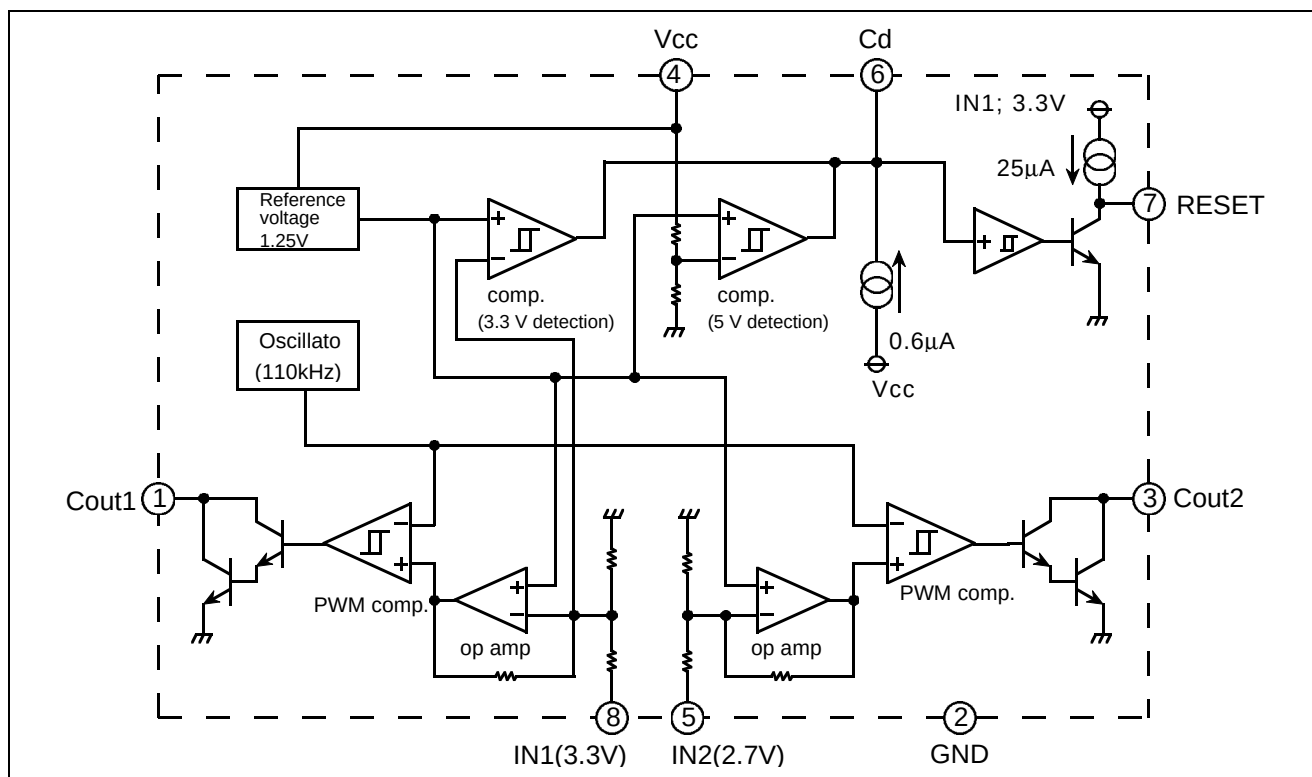
Applications

General electronic products such as mobile and portable devices

Pin Configuration (Top View)



Block Diagram



Absolute Maximum Ratings

Unless specified otherwise noted, Ta = 25°C)

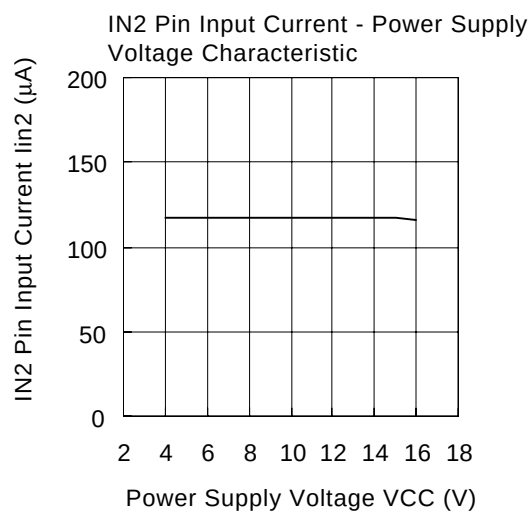
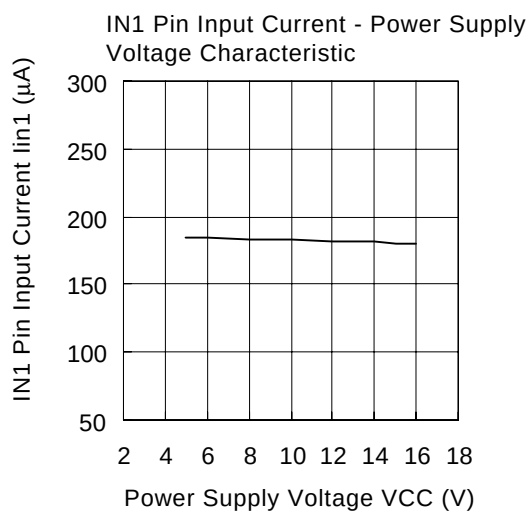
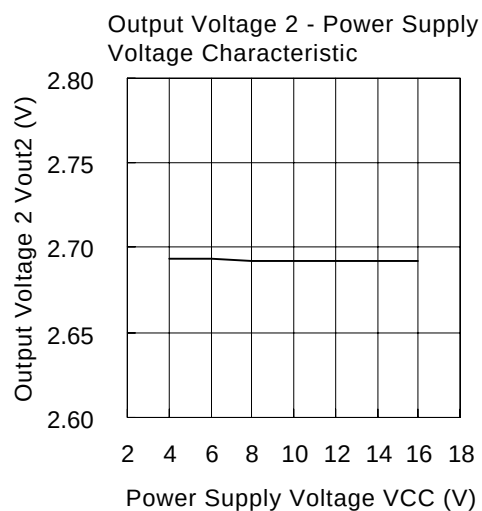
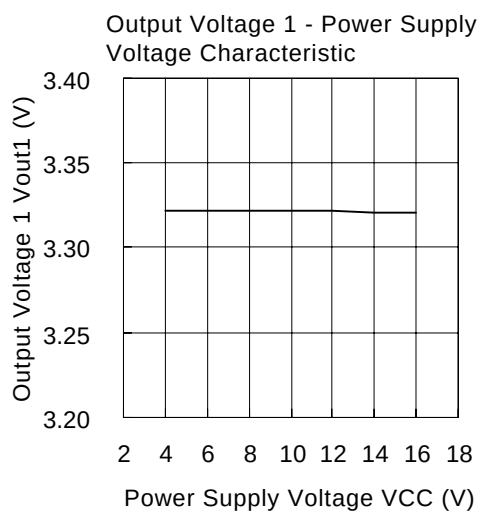
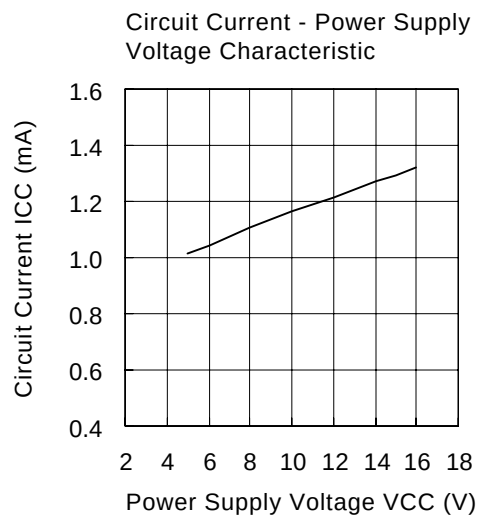
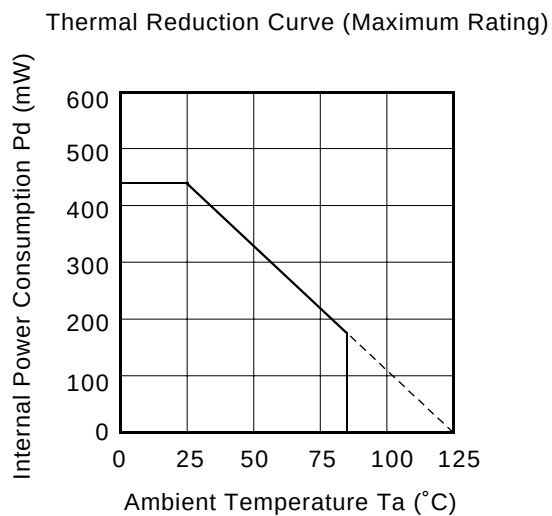
Item	Symbol	Ratings	Unit	Conditions
Power supply voltage	Vcc	16	V	
DC-DC converter block output drive current	Io	30	mA	ch1, ch2
Reset circuit block output inflow current	IoRESET	6	mA	
Internal power consumption	Pd	440	mW	Ta = 25°C
Thermal reduction ratio	Kθ	4.4	mW/°C	Ta > 25°C
Operating ambient temperature	Topr	-20 to +85	°C	
Storage temperature	Tstg	-40 to +125	°C	

Electrical Characteristics

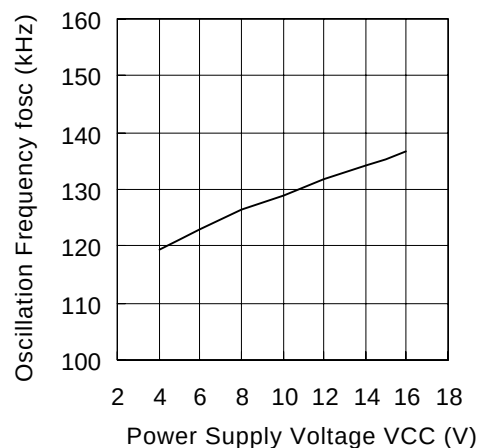
(Unless specified otherwise noted, VCC = 5 V, Ta = 25°C)

Block	Item	Symbol	Limits			Unit	Test Conditions
			Min.	Typ.	Max.		
All blocks	Power supply voltage range	Vcc	4.0	5.0	15	V	
	Current dissipation	Icc	—	1.0	1.5	mA	No output load
DC-DC converter block							
Error amp	Output voltage	Vo1	3.15	3.30	3.45	V	Ch1 output
		Vo2	2.57	2.70	2.83		Ch2 output
	Line regulation	Vreg-L	—	5	15	mV	
	Input current 1	Iin	—	150	450	μA	
	Input current 2	Iin	—	100	300	μA	
Oscillator	Oscillation frequency	fosc	65	110	160	KHz	
Output	Maximum on-duty	TDUTY	—	90	—	%	
	Output leakage current	ICL	−1	—	1	V	
	Output saturation voltage	Vsat	—	1.2	2.0	V	Io = 10 mA, Darlington connection type
Reset block							
Reset circuit	Detection voltage 1	Vs1	3.8	4.0	4.2	mV	VCC = 5 V detection
	Hysteresis voltage 1	ΔVs1	30	50	80	V	
	Detection voltage 2	Vs2	2.57	2.70	2.83	mV	Ch1 output (3.3 V) detection
	Hysteresis voltage 2	ΔVs2	30	50	80	μA	
	Delay constant current	IPD	−1.1	−0.6	−0.3	msec	
	Delay time	tpd	5	10	20	μA	Cd = 4700pF
	Output constant current	IOC	−40	−25	−17	μA	Vcc = 5V, Vo = 1/2 × Vcc
	Output low voltage	VOL	—		0.2Vo1	V	IoRESET = 4mA
	Output high voltage	VOH	0.8Vo1		—	V	

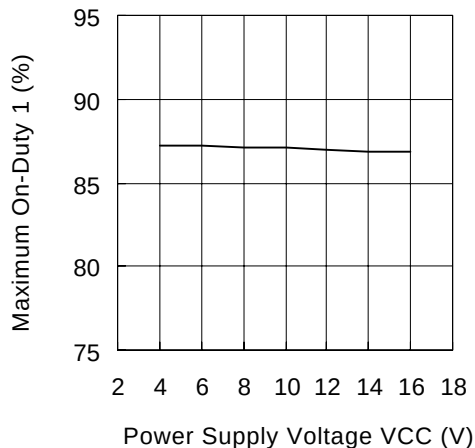
Electrical Characteristic Curves



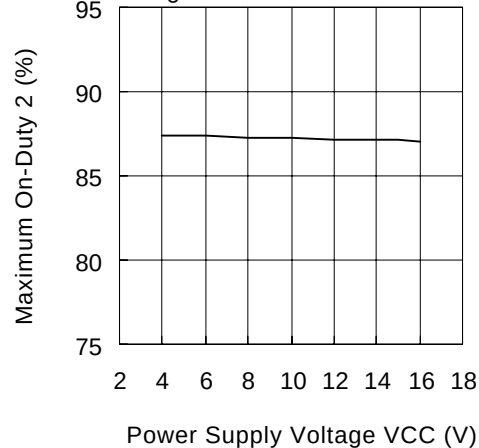
Oscillation Frequency - Power Supply Voltage Characteristic



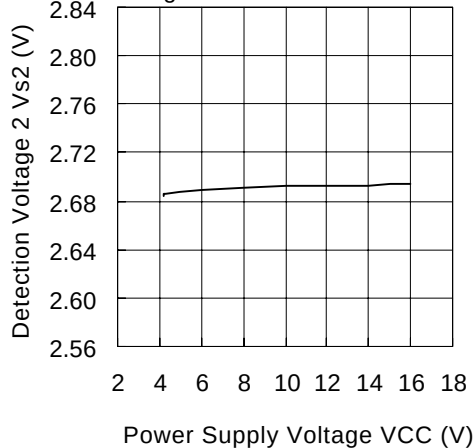
Maximum On-Duty 1 - Power Supply Voltage Characteristic



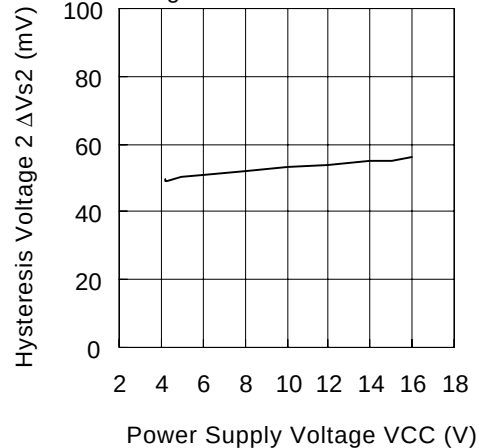
Maximum On-Duty 2 - Power Supply Voltage Characteristic



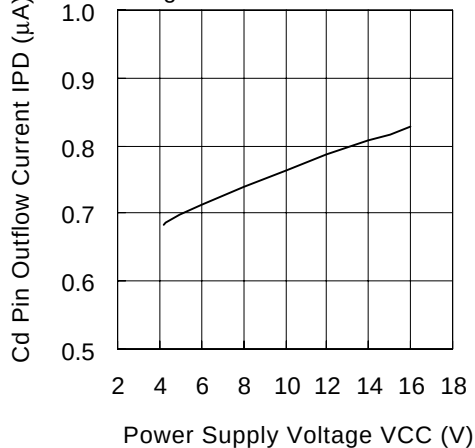
Detection Voltage 2 - Power Supply Voltage Characteristic

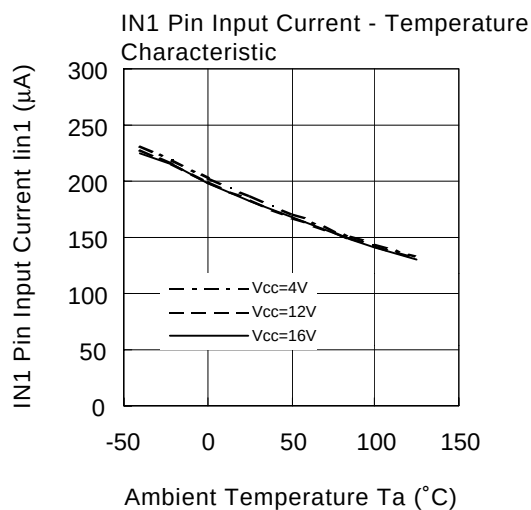
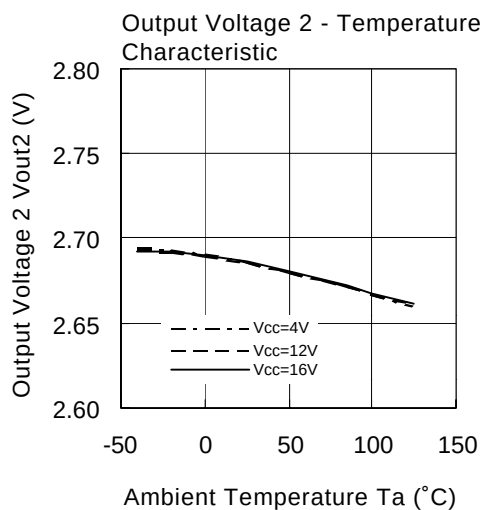
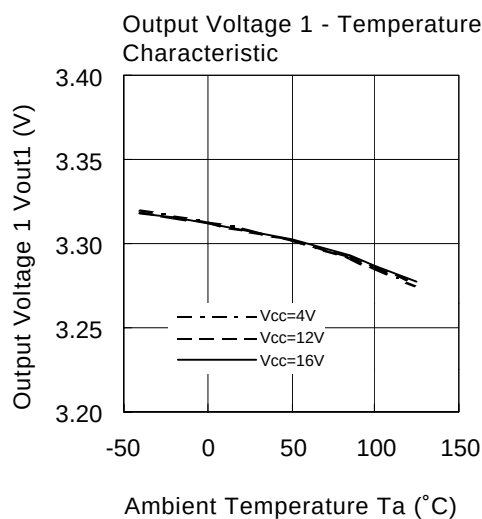
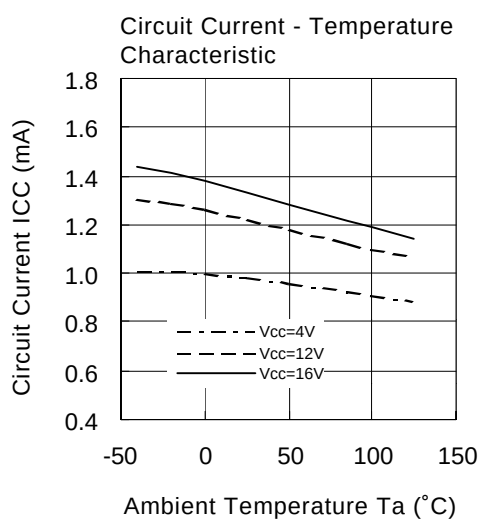
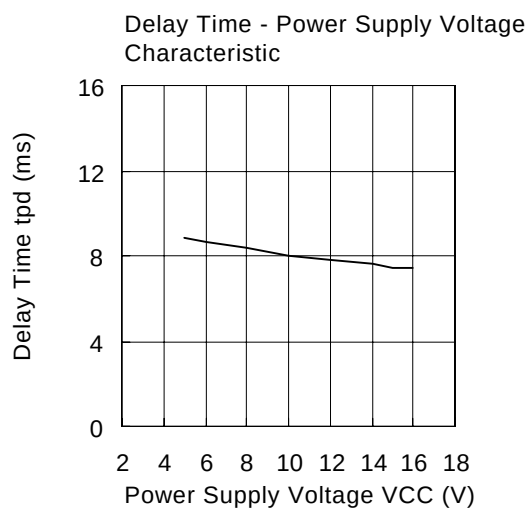
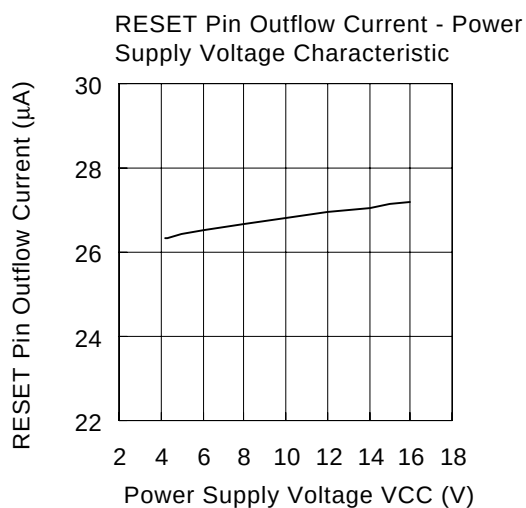


Hysteresis Voltage 2 - Power Supply Voltage Characteristic

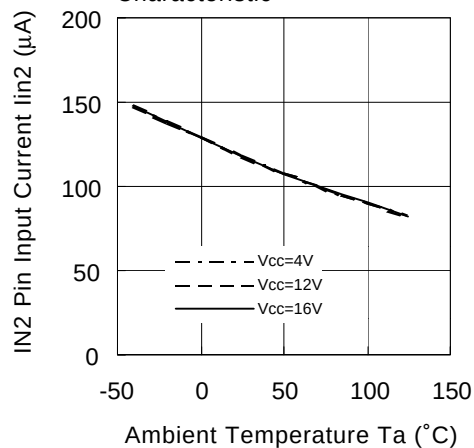


Cd Pin Outflow Current - Power Supply Voltage Characteristic

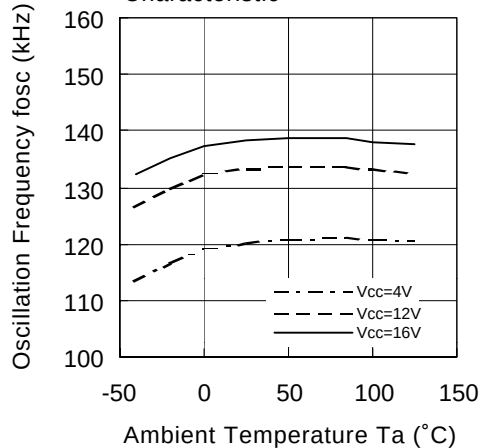




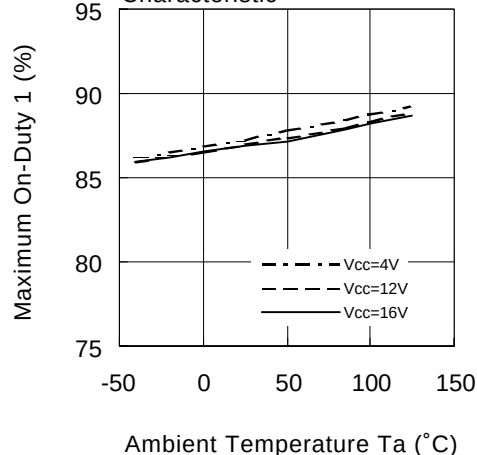
IN2 Pin Input Current - Temperature Characteristic



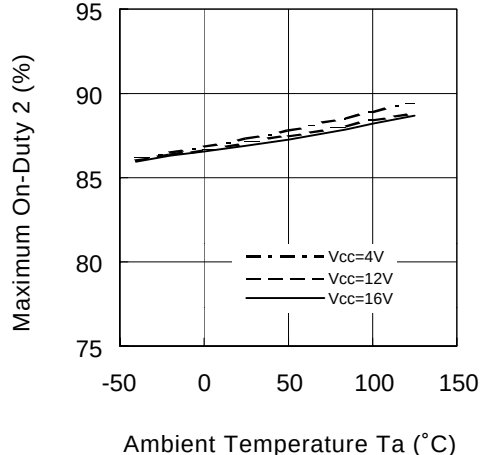
Oscillation Frequency - Temperature Characteristic



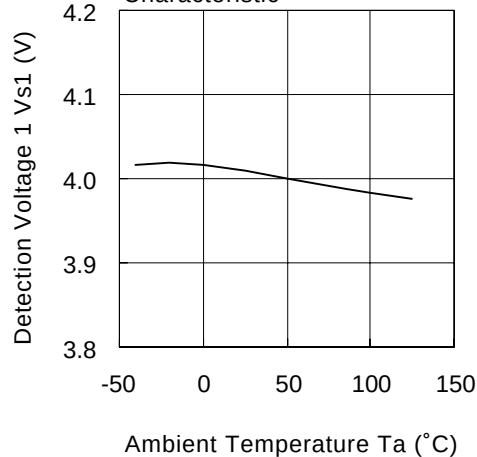
Maximum On-Duty 1 - Temperature Characteristic



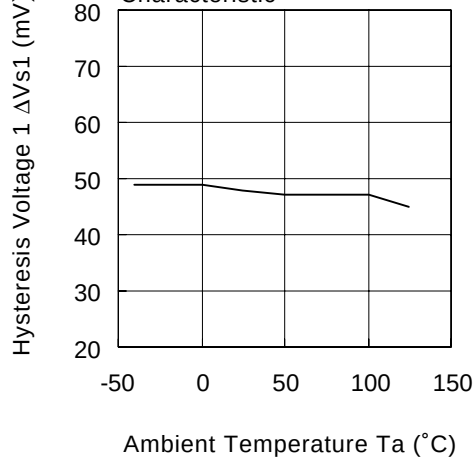
Maximum On-Duty 2 - Temperature Characteristic



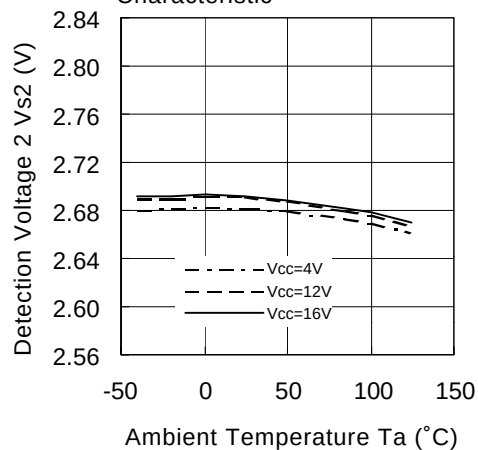
Detection Voltage 1 - Temperature Characteristic



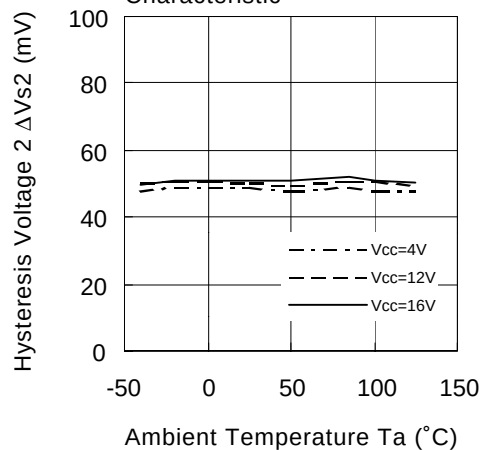
Hysteresis Voltage 1 - Temperature Characteristic



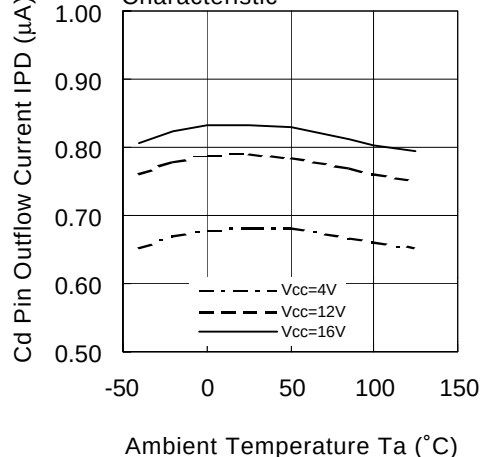
Detection Voltage 2 - Temperature Characteristic



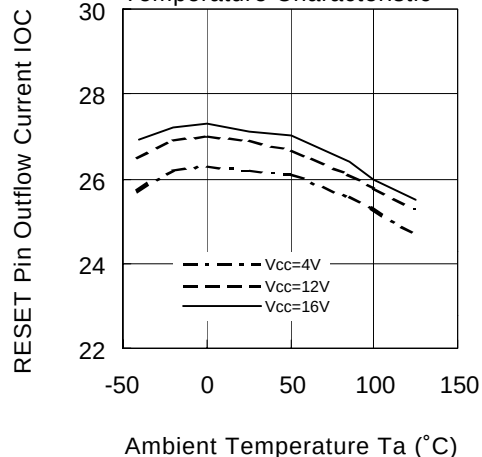
Hysteresis Voltage 2 - Temperature Characteristic



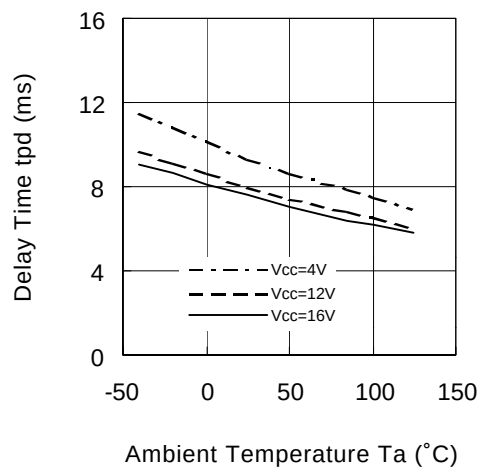
Cd Pin Outflow Current IPD (μA) - Temperature Characteristic



RESET Pin Outflow Current IOC (μA) - Temperature Characteristic

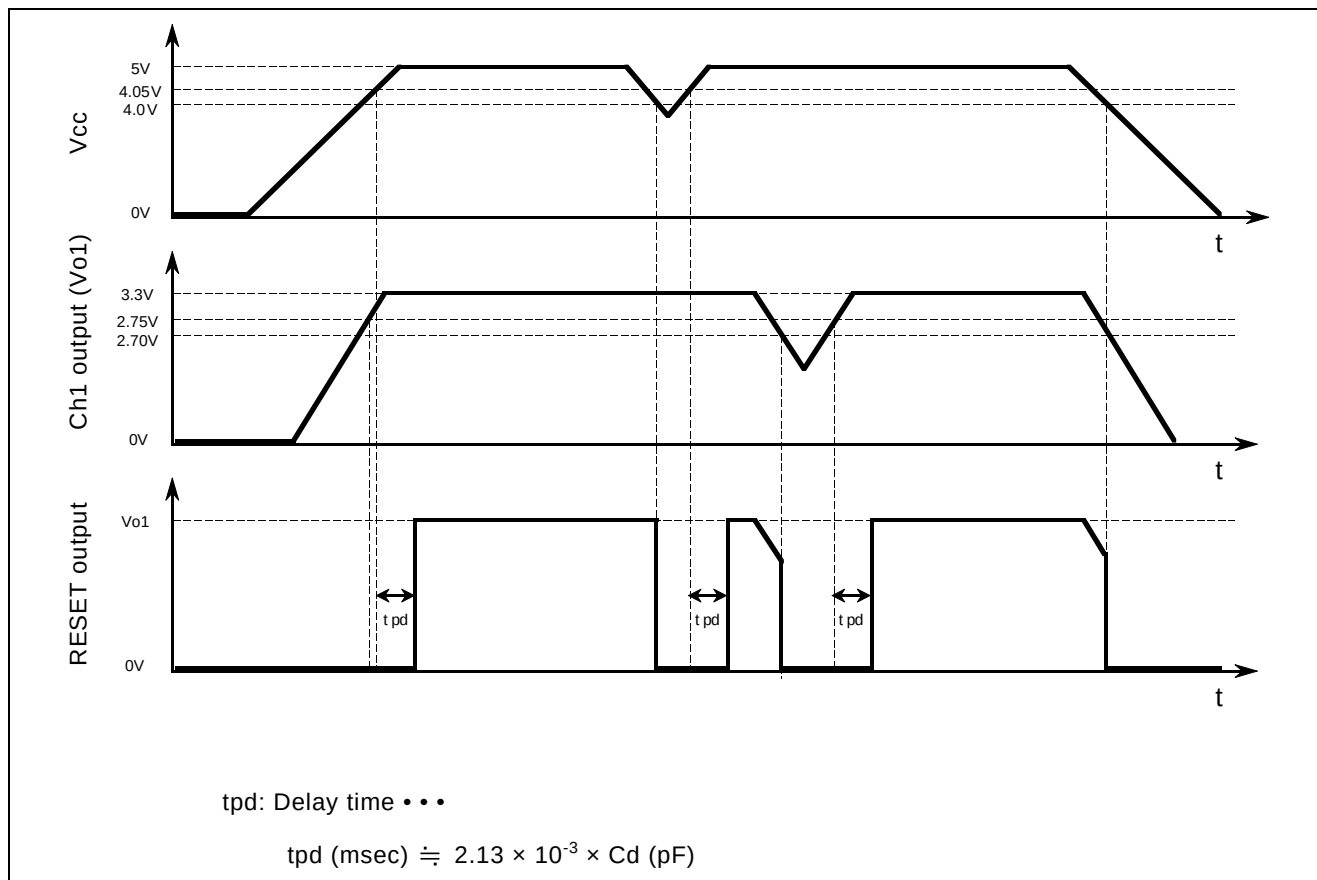


Delay Time - Temperature Characteristic



Reset Circuit Operation

Reset Circuit Block Timing Chart





Notes:

- VF: Forward voltage of external diode
- Vsat: Output saturation voltage of external transistor
- ΔI_o : Set to 1/5 to 1/3 of the maximum load current.
- Use an external transistor Tr., diode D, and inductor L with a current rating of I_{pk} or above.

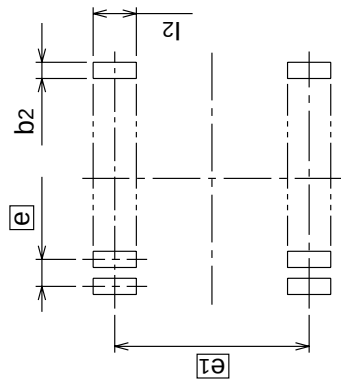
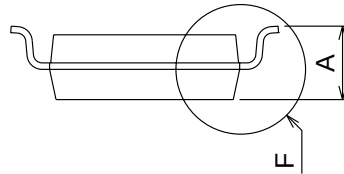
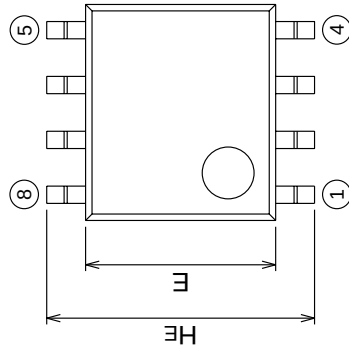
Package Dimensions

8P2S-A

(MMP)

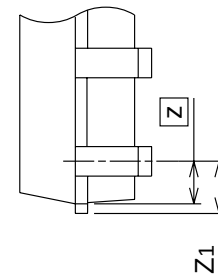
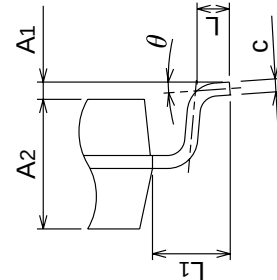
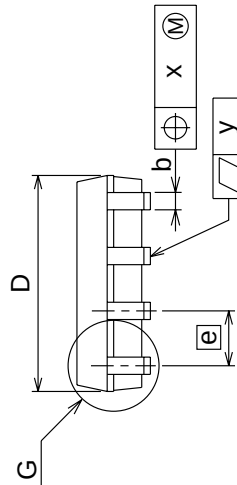
Plastic 8pin 225mil SOP

EIAJ Package Code	JEDEC Code	Weight(g)	Lead Material
SOP8-P-225-1.27	—	0.07	Cu Alloy



Recommended Mount Pad

Symbol	Dimension in Millimeters		
	Min	Nom	Max
A	—	—	1.9
A1	0.05	—	—
A2	—	1.5	—
b	0.35	0.4	0.5
c	0.13	0.15	0.2
D	4.8	5.0	5.2
E	4.2	4.4	4.6
e	—	1.27	—
HE	5.9	6.2	6.5
L	0.2	0.4	0.6
L1	—	0.9	—
z	—	0.595	—
Z1	—	—	0.745
x	—	—	0.25
y	—	—	0.1
θ	0°	—	10°
b2	—	0.76	—
e1	—	5.72	—
l2	1.27	—	—



Detail F

Detail G

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