

General Description

OCP1303A is a low dropout, low power linear regulator which operates from 1.5V to 5.5V input voltage. OCP1303A provides high power supply rejection ratio (PSRR) and delivers up to 300mA output current. OCP1303A also offers low current consumption for battery operated applications.

The device is a RoHS compliant DFN10x10-4L package.

Applications

- Smart phones, Cell phone, PDAs
- Bluetooth, Wireless handsets
- Portable equipment

Features

- Input Voltage Range: 1.5V to 5.5V
- Output Voltage Range: 0.9V to 3.6V
- Output Current: 300mA
- Low Quiescent Current: 40 μ A(TYP)
- Shut Down Current: <1 μ A
- Auto-Discharge function
- Available in DFN10x10-4L package
- -40°C to +85°C Operating Temperature Range

Pin Configuration

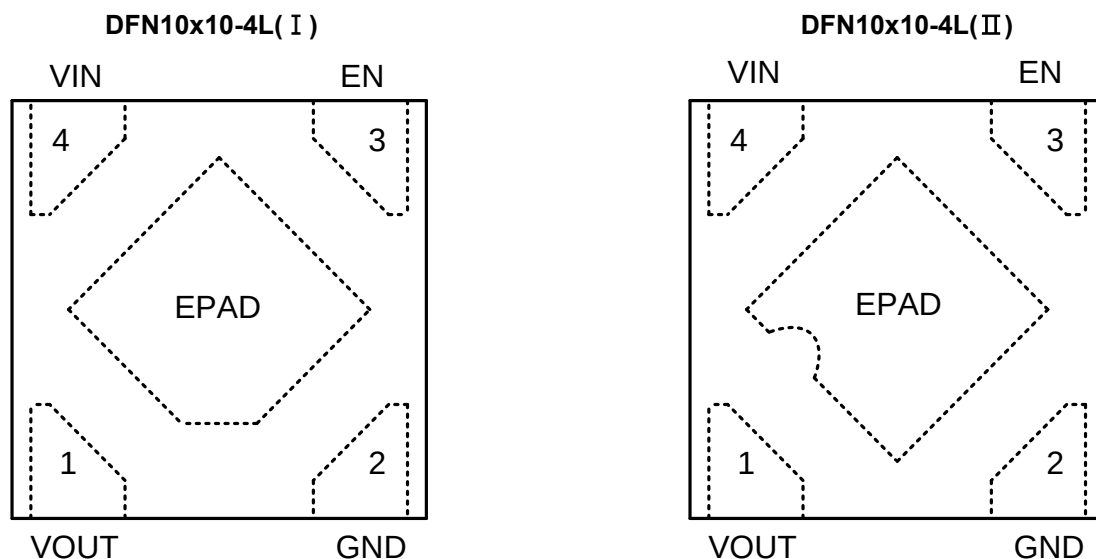


Figure 1, Pin Assignments of OCP1303A (Top View)

Pin No.	Pin Name	Pin Function
1	VOUT	Regulator Output Pin. Bypass a 1 μ F capacitor to ground
2	GND	Ground
3	EN	Enable control pin, active high. When EN pin is floating, it will be shutdown mode.
4	VIN	Regulator Input Pin. 1 μ F decouple capacitor is needed.
Exposed PAD	-	The exposed pad should be connected to a large ground plane to maximize thermal performance.



Typical Application Circuit

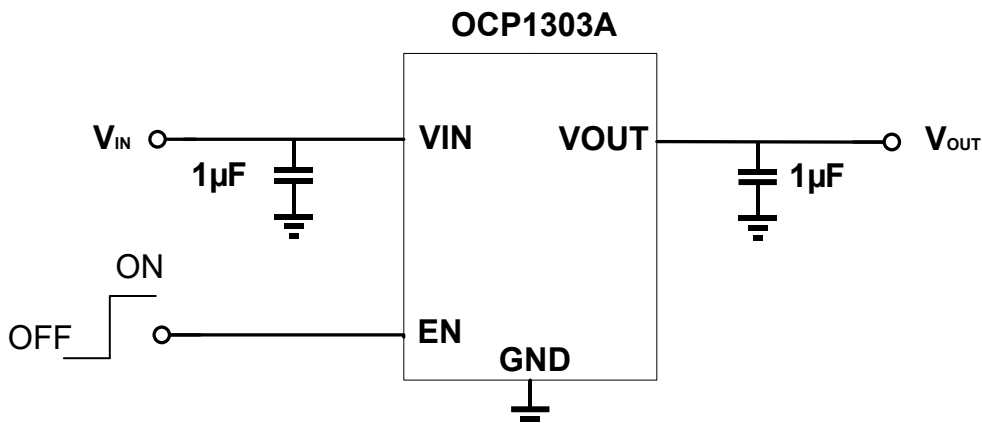


Figure 2, Typical Application Block diagram of OCP1303A

Block Diagram

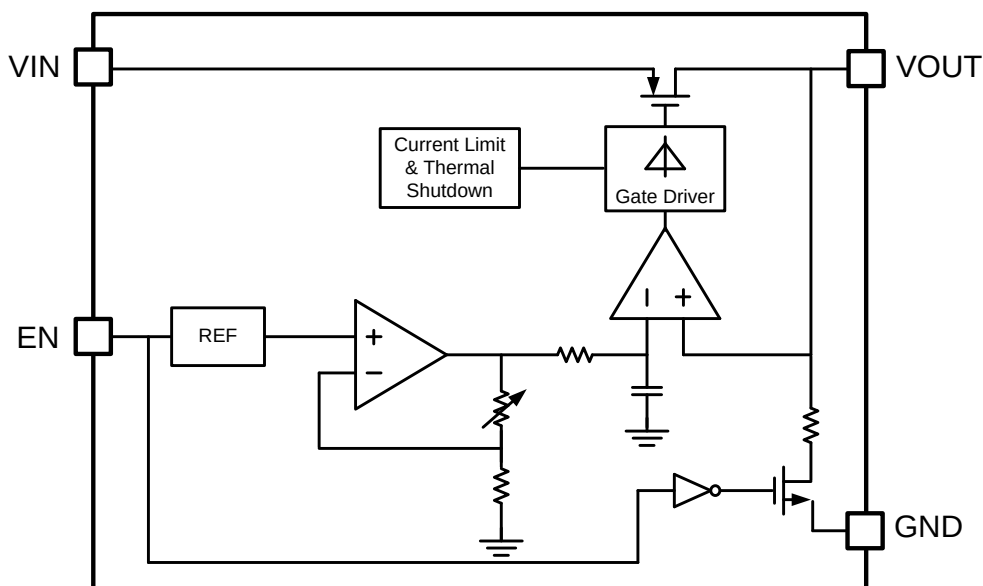


Figure 3, Block diagram of OCP1303A

Absolute Maximum Ratings¹ ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Rating	Unit
Input Voltage Range	V_{IN}	-0.3 to 6.5	V
Output Voltage Range	V_{OUT}	-0.3 to V_{IN}	V
Enable Input Voltage Range	V_{EN}	-0.3 to V_{IN}	V
Maximum Load Current	I_{OUT}	400	mA
Human Body Model	HBM	5	kV
Charged Device Model	CDM	1	kV
Storage Temperature Range	T_S	-55 to +150	$^{\circ}\text{C}$
Maximum Operating Junction Temperature Range	T_J	-40 to 125	$^{\circ}\text{C}$

Notes: 1) Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.



Recommended Operating Conditions² ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Rating	Unit
Input Voltage	V_{IN}	1.5 ~ 5.5	V
Ambient Operating Temperature	T_A	-40 to 85	$^{\circ}\text{C}$
Thermal Resistance	$R_{\theta JA}$	179	$^{\circ}\text{C/W}$

Notes: 2) The device is not guaranteed to function outside of its operating conditions.

Electrical Characteristics

(Unless otherwise noted, typical values are at $T_A=25^{\circ}\text{C}$, $V_{IN}=V_{OUT} + 1\text{V}$, $C_{IN}=C_{OUT}=1\mu\text{F}$)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{OUT}	Output Voltage	$I_{OUT}=1\text{mA}$	0.98* V_{OUT}	V_{OUT}	1.02* V_{OUT}	V
I_{LIM}	Current Limit		350			mA
$V_{Dropout}$	Dropout Voltage	$V_{OUT}=3.3\text{V}$, $I_{OUT}=300\text{mA}$		130	180	mV
		$V_{OUT}=3.0\text{V}$, $I_{OUT}=300\text{mA}$		150	200	
		$V_{OUT}=2.8\text{V}$, $I_{OUT}=300\text{mA}$		160	220	
		$V_{OUT}=2.5\text{V}$, $I_{OUT}=300\text{mA}$		200	270	
		$V_{OUT}=1.8\text{V}$, $I_{OUT}=300\text{mA}$		240	330	
		$V_{OUT}=1.2\text{V}$, $I_{OUT}=300\text{mA}$		430	510	
Reg-LINE	Line Regulation	$V_{IN}=1.9\text{V}\sim 5.5\text{V}$, $I_{OUT}=1\text{mA}$		0.03	0.2	%/V
		$V_{IN}=1.9\text{V}\sim 5.5\text{V}$, $I_{OUT}=100\text{mA}$		7	20	mV
Reg-LOAD	Load Regulation	$V_{OUT}=1.8\text{V}$, $I_{OUT}=1\sim 300\text{mA}$		15	30	mV
I_{SHDN}	Shut-down Current	$V_{EN}=0\text{V}$			1	μA
I_Q	Quiescent Current	$V_{OUT}=1.8\text{V}$, $I_{OUT}=0\text{mA}$		40	60	μA
I_{SHORT}	Short Current Limit	$V_{OUT}=0\text{V}$		240		mA
PSRR	Power Supply Rejection Rate	$V_{IN}=(V_{OUT}+1\text{V})\text{DC}+0.5\text{Vp-p}$, $F=217\text{Hz}$, $I_{OUT}=10\text{mA}$, $C_{OUT}=1\mu\text{F}$		85		dB
		$V_{IN}=(V_{OUT}+1\text{V})\text{DC}+0.5\text{Vp-p}$, $F=1\text{kHz}$, $I_{OUT}=10\text{mA}$, $C_{OUT}=1\mu\text{F}$		90		
		$V_{IN}=(V_{OUT}+1\text{V})\text{DC}+0.5\text{Vp-p}$, $F=100\text{kHz}$, $I_{OUT}=10\text{mA}$, $C_{OUT}=1\mu\text{F}$		52		
		$V_{IN}=(V_{OUT}+1\text{V})\text{DC}+0.5\text{Vp-p}$, $F=1\text{MHz}$, $I_{OUT}=10\text{mA}$, $C_{OUT}=1\mu\text{F}$		42		
E_{no}	Output Voltage Noise	10Hz to 100kHz, $I_{OUT}=10\text{mA}$, $C_{OUT}=1\mu\text{F}$		17		μVRMS
V_{IH}	EN Input Logic High	V_{IN} : 1.9 V to 5.5 V	1.0			V
V_{IL}	EN Input Logic Low	V_{IN} : 1.9 V to 5.5 V			0.4	V
R_{PD}	EN pull-down resistance	$V_{OUT}<2.5\text{V}$		3		$\text{M}\Omega$
		$V_{OUT}\geq 2.5\text{V}$		1		$\text{M}\Omega$
R_{DIS}	RON of Discharge path	$V_{IN}=4\text{V}$, $V_{EN}=0\text{V}$		120		Ω
T_{SHDN}	Thermal-Shutdown Temperature			160		$^{\circ}\text{C}$
T_{SDH}	Thermal Shutdown Hysteresis			30		$^{\circ}\text{C}$



■ Application Information

Input Capacitor:

A 1 μ F ceramic capacitor is recommended to connect V_{IN} pin as close as possible which is used to provide low impedance path to unwanted signal or noise. Larger input capacitor may be necessary if fast and large load transients are encountered in the application. For PCB layout, a wide copper trace is required for both V_{IN} and GND.

Output Capacitor:

The output capacitor is required for the LDO stability. The recommended output capacitance is from 1 μ F to 4.7 μ F. Place output capacitor as close as possible to V_{OUT} pin. Equivalent Series Resistance (ESR) is from 5m Ω to 100m Ω , and temperature characteristics are X7R or X5R. Place output capacitor as close as possible to V_{OUT} and GND pins.

ON/OFF Input Operation

The OCP1303A is turned on by setting the EN pin high, and is turned off by pulling it low or floating. If this feature is not used, the EN pin should be tied to V_{IN} pin to keep the regulator output on at all time.

Recommended PCB Layout

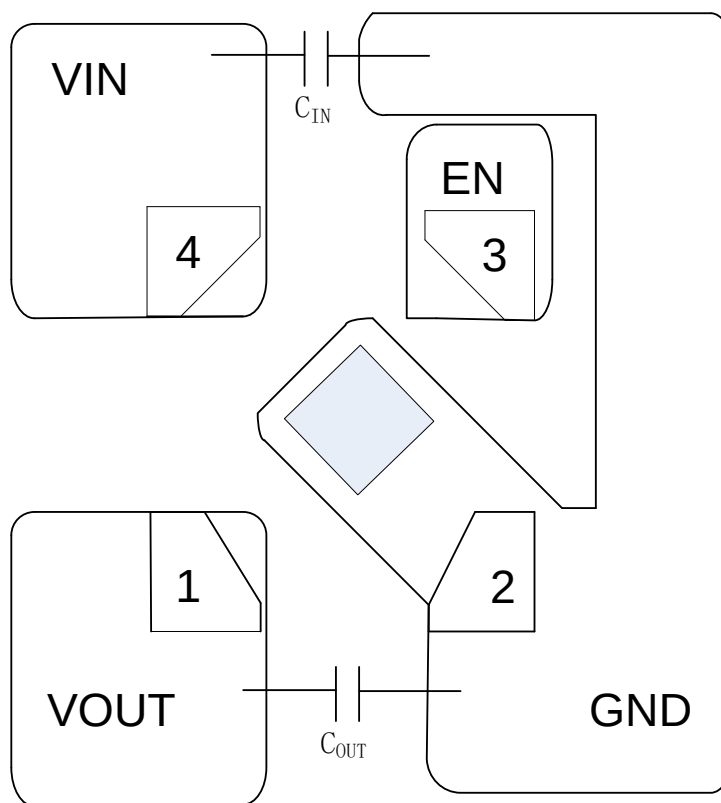
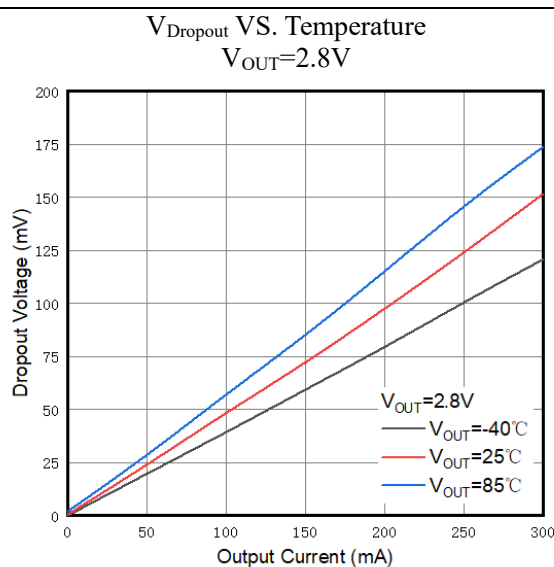
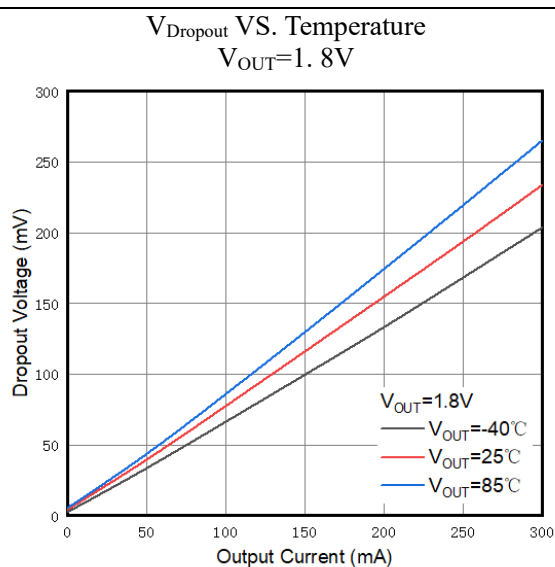
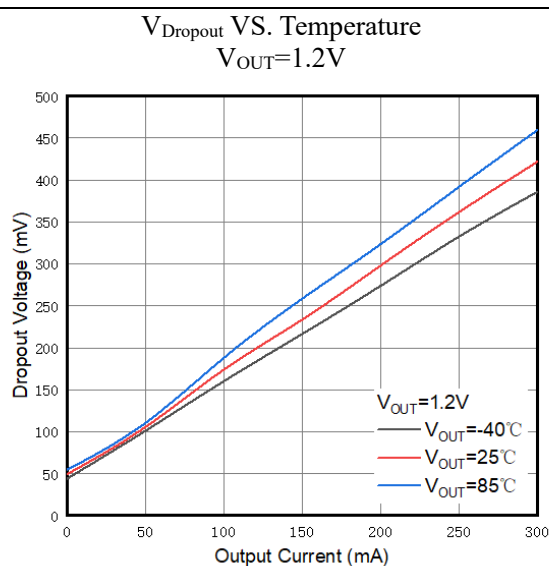
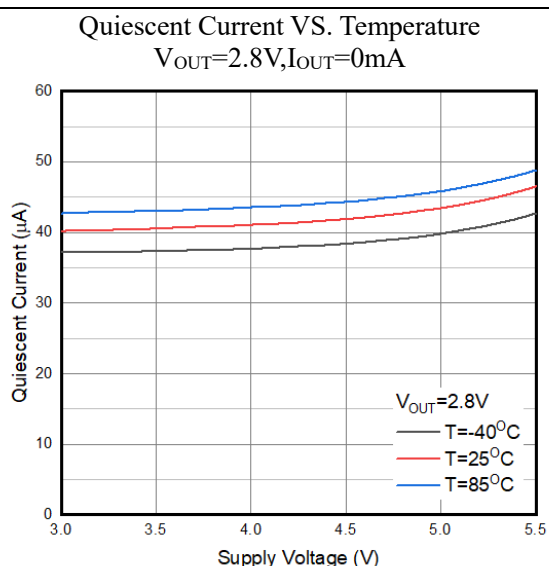
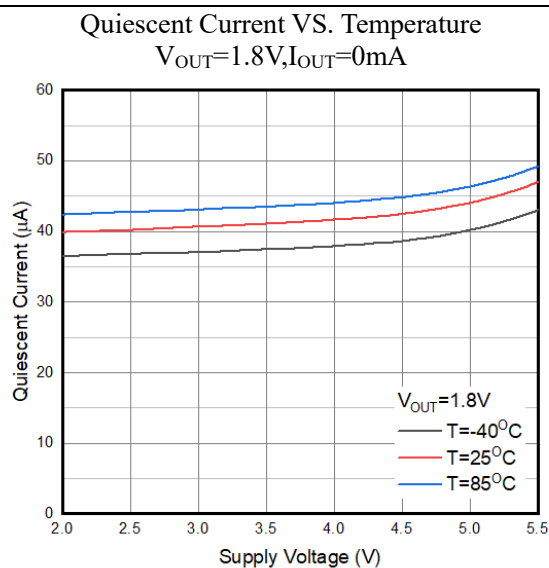
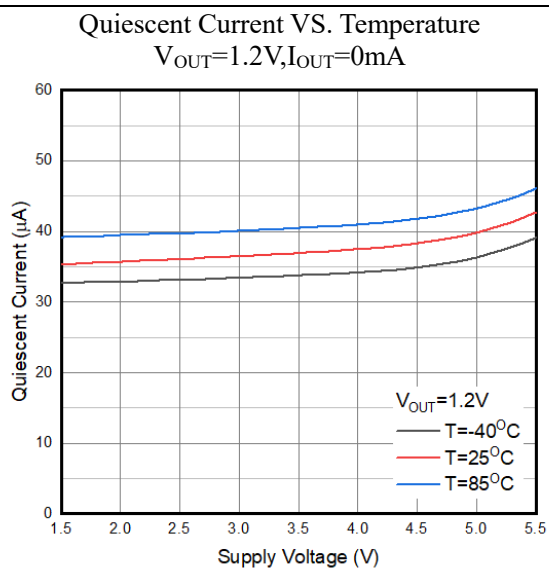


Figure 4, Land Pattern Example of OCP1303A



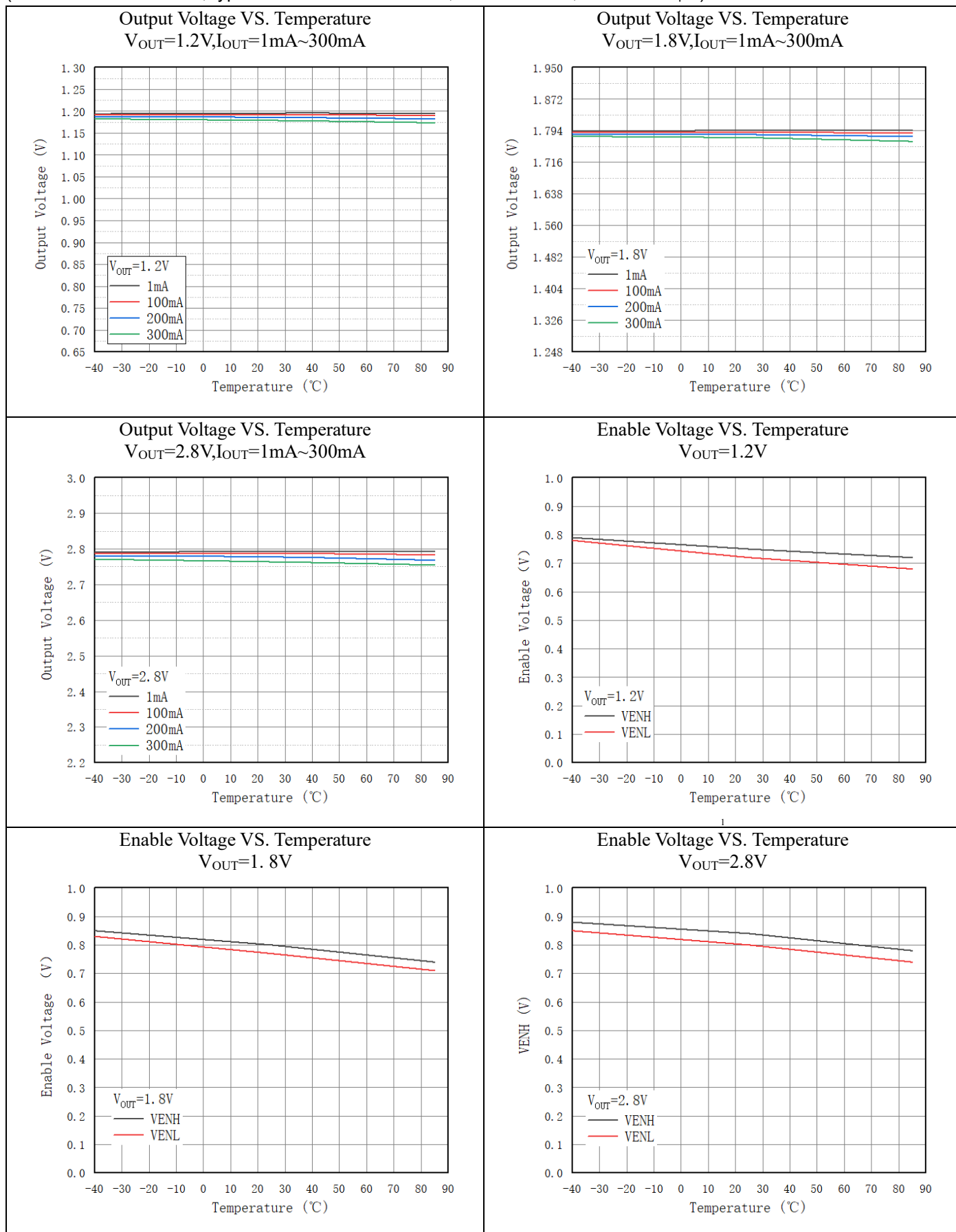
■ Electrical Characteristics

(Unless otherwise noted, typical values are at $T_A=25^{\circ}\text{C}$, $V_{\text{IN}}=V_{\text{OUT}} + 1\text{V}$, $C_{\text{IN}}=C_{\text{OUT}}=1\mu\text{F}$)



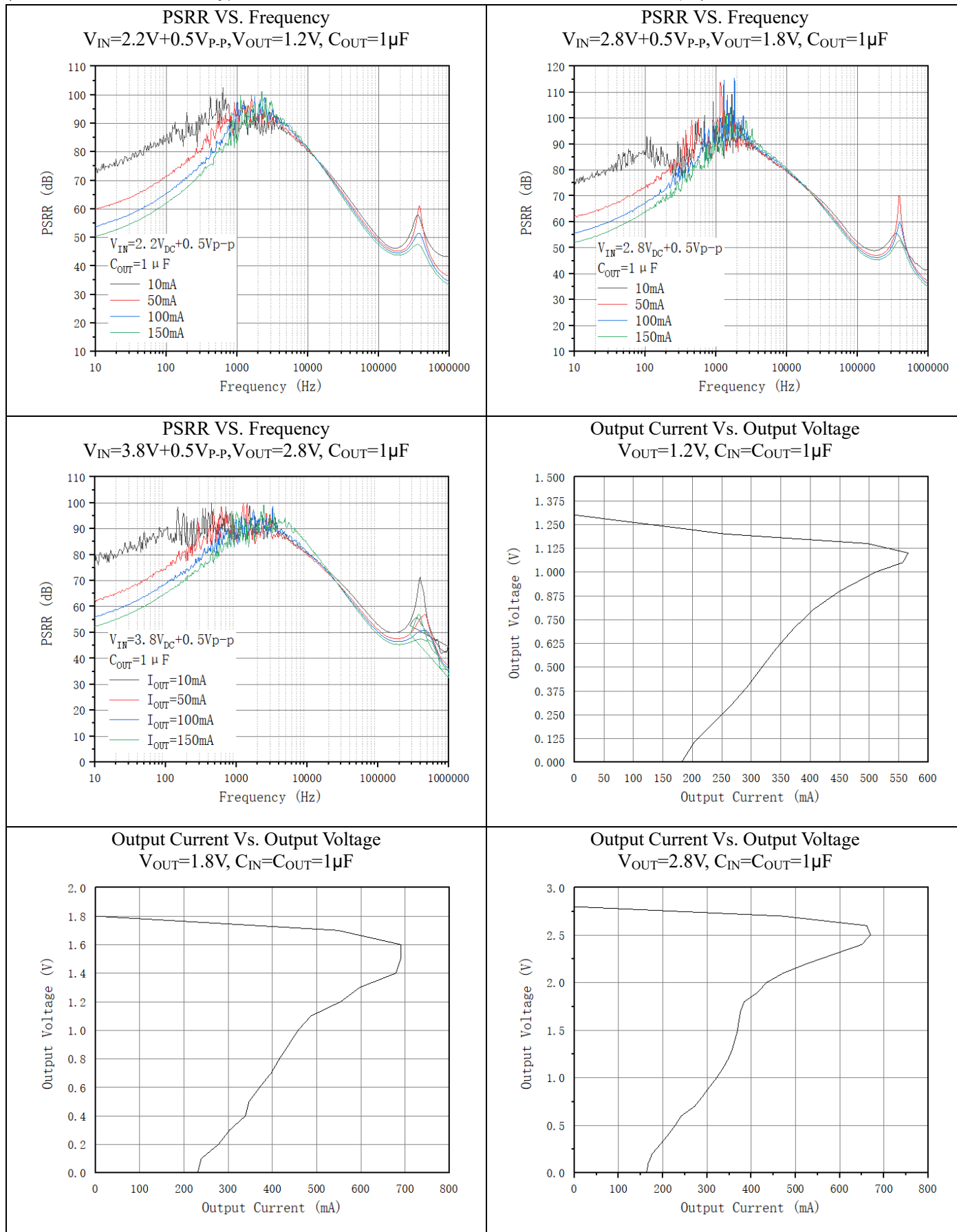
■ Electrical Characteristics (Continued)

(Unless otherwise noted, typical values are at $T_A=25^{\circ}\text{C}$, $V_{\text{IN}}=V_{\text{OUT}} + 1\text{V}$, $C_{\text{IN}}=C_{\text{OUT}}=1\mu\text{F}$)



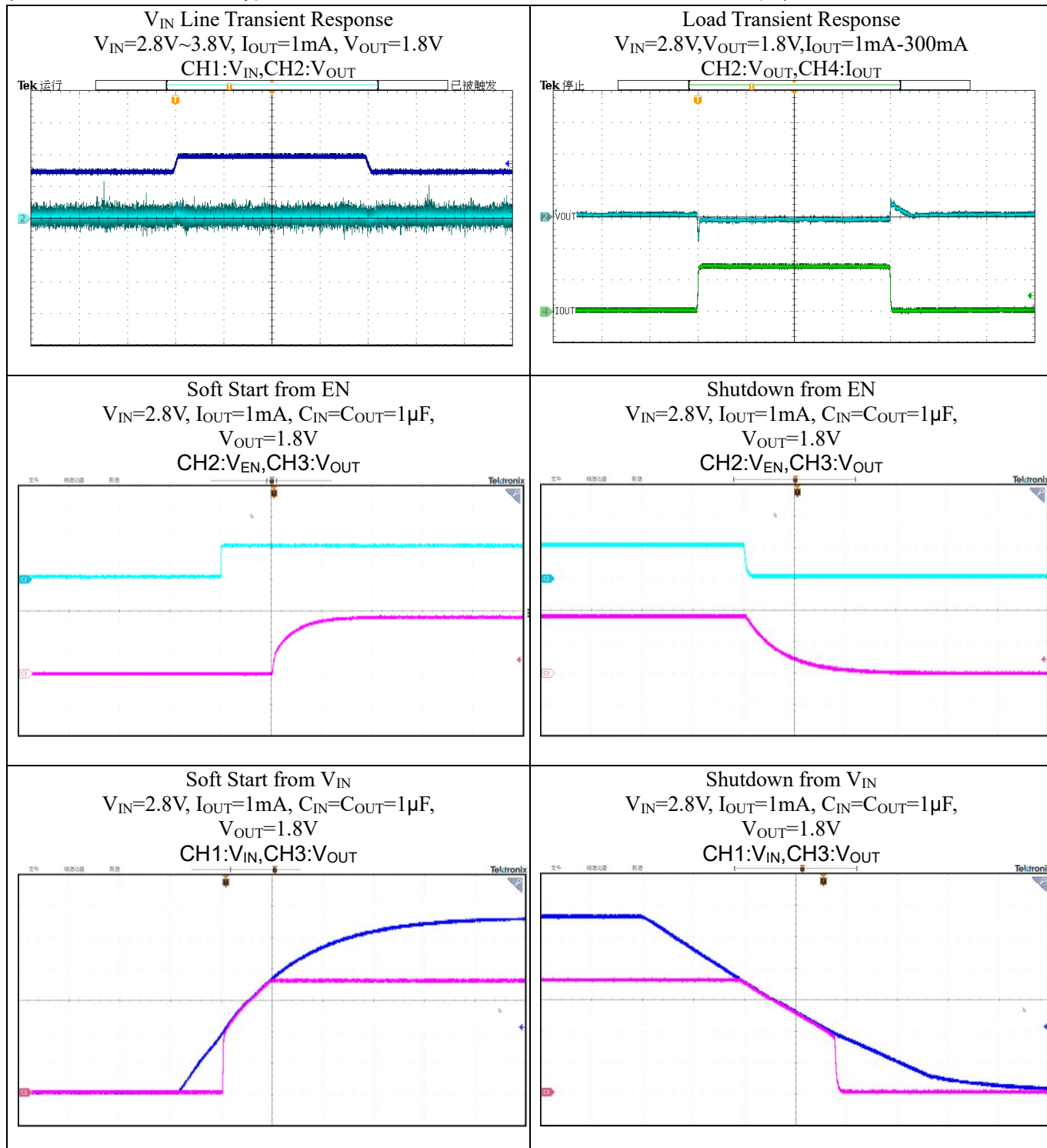
■ Electrical Characteristics (Continued)

(Unless otherwise noted, typical values are at $T_A=25^{\circ}\text{C}$, $V_{IN}=V_{OUT} + 1\text{V}$, $C_{IN}=C_{OUT}=1\mu\text{F}$)



■ Electrical Characteristics (Continued)

(Unless otherwise noted, typical values are at $T_A=25^{\circ}\text{C}$, $V_{IN}=V_{OUT} + 1\text{V}$, $C_{IN}=C_{OUT}=1\mu\text{F}$)

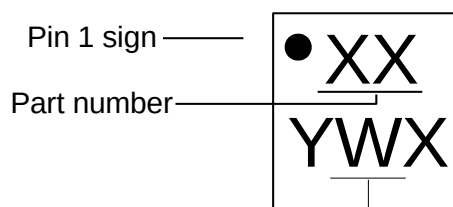


■ Ordering Information

Part Number	V _{OUT} (V)	Marking	Package Type	Package Qty	Temperature	Eco Plan	Lead
OCP1303AV12AD	1.2	XA	DFN1010-4L	10000pcs	-40~85°C	Green and RoHS	Sn
OCP1303AV18AD	1.8	XC	DFN1010-4L	10000pcs	-40~85°C	Green and RoHS	Sn
OCP1303AV25AD	2.5	XD	DFN1010-4L	10000pcs	-40~85°C	Green and RoHS	Sn
OCP1303AV28AD	2.8	XE	DFN1010-4L	10000pcs	-40~85°C	Green and RoHS	Sn
OCP1303AV30AD	3.0	XF	DFN1010-4L	10000pcs	-40~85°C	Green and RoHS	Sn
OCP1303AV33AD	3.3	XG	DFN1010-4L	10000pcs	-40~85°C	Green and RoHS	Sn

■ Marking Information

DFN1010-4L



Date code:

Y: Year (1=2021)

W: Nth week (01~52)

A~Z: 1 ~ 26 week

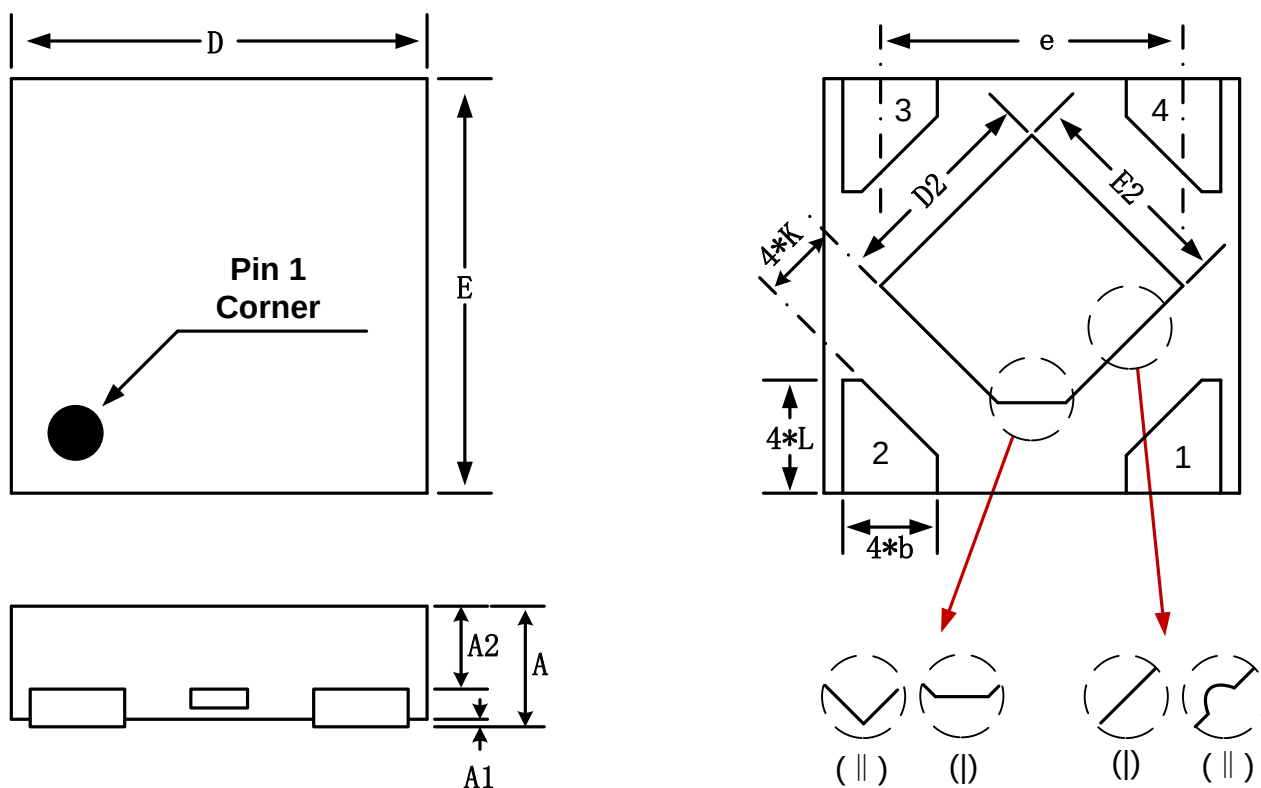
a~z: 27~52 week

X:0-9,A-Z,a-z



Package Information

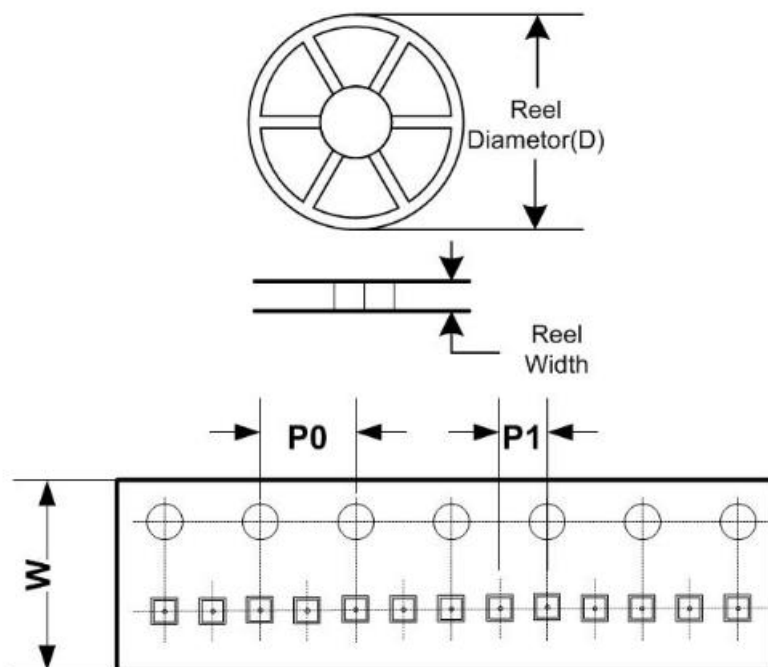
DFN1010-4L



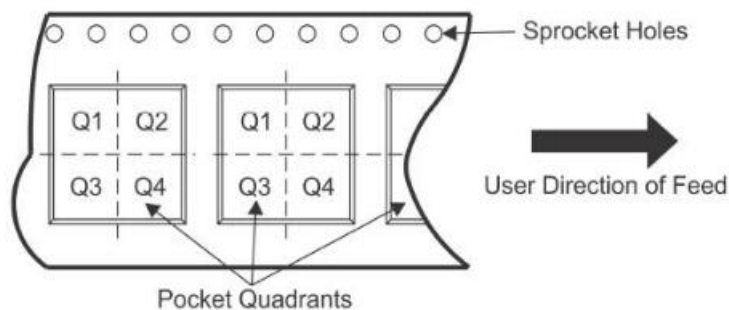
Symbol	Dimensions In Millimeters		
	Min.	Nom.	Max.
A	0.35	-	0.50
A1	0.00	0.02	0.05
A2	-	0.27	-
b	0.18	0.22	0.30
D	1 BSC		
E	1 BSC		
e	0.65 BSC		
D2	0.38	0.48	0.58
E2	0.38	0.48	0.58
L	0.20	0.25	0.30
K	0.21 REF		

■ Packing Information

DFN1010-4L



QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



Package Type	Carrier Width (W)	Pitch (P0)	Pitch (P1)	Reel Size(D)	Packing Minimum	PIN 1 Quadrant	MSL
DFN1010-4L	8.0±0.1 mm	4.0±0.1 mm	2.0±0.1 mm	180±1 mm	10000pcs	Q1	Level-1-260C

Note: Carrier Tape Dimension, Reel Size and Packing Minimum



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