

■ General Description

OCP2820 is a low dropout, low power linear regulator which operates from 2.2V to 5.5V input voltage.

OCP2820 provides high power supply rejection ratio (PSRR) and delivers up to 300mA output current. OCP2820 also offers low current consumption for battery operated applications.

The device is a RoHS compliant DFN1010-4L and SOT23 package.

■ Applications

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

■ Features

- Input Voltage Range: 2.2V to 5.5V
- Output Voltage Range: 1.0V to 3.8V
- Output Current: 300mA
- Low Quiescent Current: 40μA(Typ)
- Shut Down Current: <1μA
- Auto-Discharge function
- Available in DFN package
- Available in SOT23 package
- -40°C to +85°C Operating Temperature Range



■ Pin Configuration

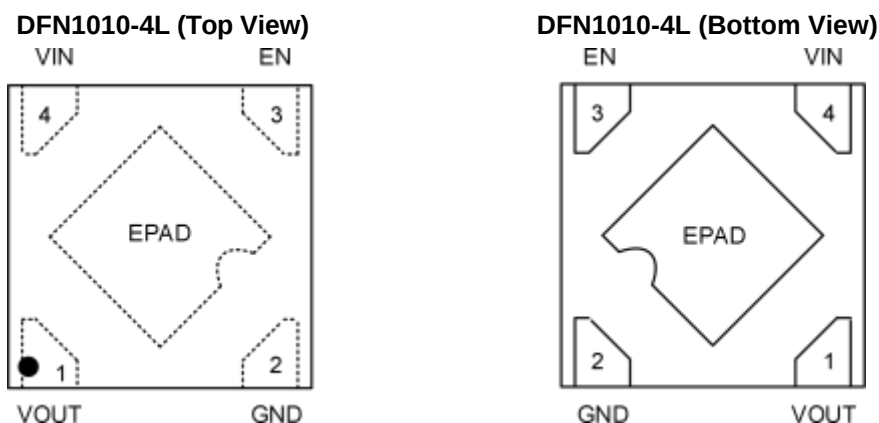


Figure 1(A), Pin Assignments of OCP2820VxxAD

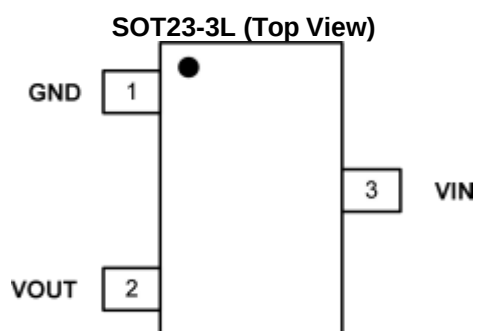


Figure 1(B), Pin Assignments of OCP2820WxxAD

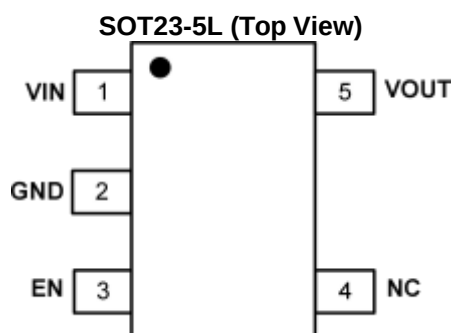


Figure 1(C), Pin Assignments of OCP2820WExxAD

Pin No.			Pin Name	Pin Function
DFN1010-4L	SOT23-3L	SOT23-5L		
1	2	5	VOUT	Regulator Output Pin. Bypass a 1 μ F capacitor to ground
2	1	2	GND	Ground
3	-	3	EN	Enable control pin, active high. When EN pin is floating, it will be shutdown mode.
4	3	1	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.
NC	-	4	-	Not connected.



■ Typical Application Circuit

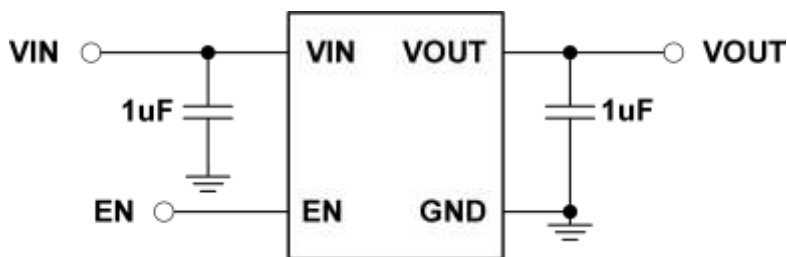


Figure 2(A), Typical Application Schematics of OCP2820VxxAD & OCP2820WExxAD

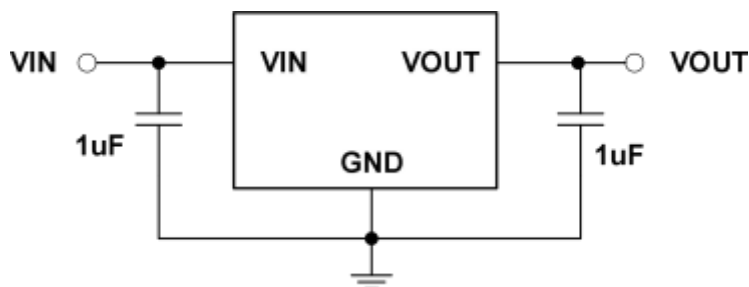


Figure 2(B), Typical Application Schematics of OCP2820WxxAD

■ Ordering Information

Part Number	V _{OUT} (V)	Marking	Package Type	Package Qty	Temperature	Eco Plan	Lead
OCP2820V12AD	1.2	ZL	DFN1010-4L	10000pcs	-40~85°C	Green	Sn
OCP2820V18AD	1.8	ZM	DFN1010-4L	10000pcs	-40~85°C	Green	Sn
OCP2820V25AD	2.5	ZN	DFN1010-4L	10000pcs	-40~85°C	Green	Sn
OCP2820V28AD	2.8	ZP	DFN1010-4L	10000pcs	-40~85°C	Green	Sn
OCP2820V30AD	3.0	ZQ	DFN1010-4L	10000pcs	-40~85°C	Green	Sn
OCP2820V33AD	3.3	ZO	DFN1010-4L	10000pcs	-40~85°C	Green	Sn
OCP2820W12AD	1.2	ZL	SOT23-3L	3000pcs	-40~85°C	Green	Sn
OCP2820W18AD	1.8	ZM	SOT23-3L	3000pcs	-40~85°C	Green	Sn
OCP2820W25AD	2.5	ZN	SOT23-3L	3000pcs	-40~85°C	Green	Sn
OCP2820W28AD	2.8	ZP	SOT23-3L	3000pcs	-40~85°C	Green	Sn
OCP2820W30AD	3.0	ZQ	SOT23-3L	3000pcs	-40~85°C	Green	Sn
OCP2820W33AD	3.3	ZO	SOT23-3L	3000pcs	-40~85°C	Green	Sn
OCP2820WE12AD	1.2	ZA	SOT23-5L	3000pcs	-40~85°C	Green	Sn
OCP2820WE15AD	1.5	ZY	SOT23-5L	3000pcs	-40~85°C	Green	Sn
OCP2820WE18AD	1.8	ZB	SOT23-5L	3000pcs	-40~85°C	Green	Sn
OCP2820WE25AD	2.5	ZC	SOT23-5L	3000pcs	-40~85°C	Green	Sn
OCP2820WE28AD	2.8	ZD	SOT23-5L	3000pcs	-40~85°C	Green	Sn
OCP2820WE30AD	3.0	ZE	SOT23-5L	3000pcs	-40~85°C	Green	Sn
OCP2820WE33AD	3.3	ZF	SOT23-5L	3000pcs	-40~85°C	Green	Sn



■ Block Diagram

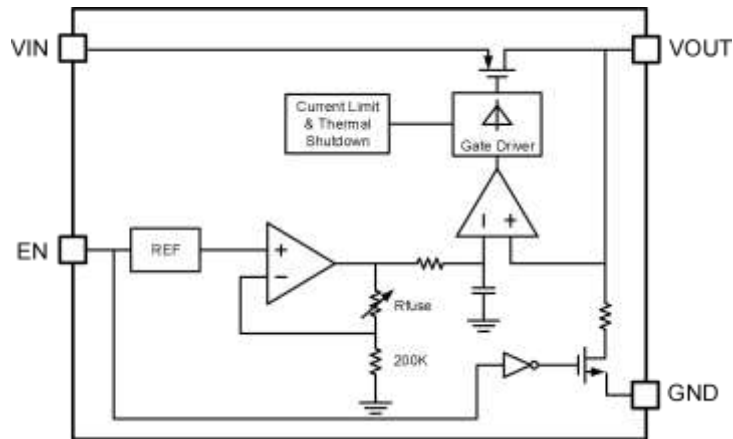


Figure 3(A), Typical Application Block diagram of OCP2820VxxAD & OCP2820WExxAD

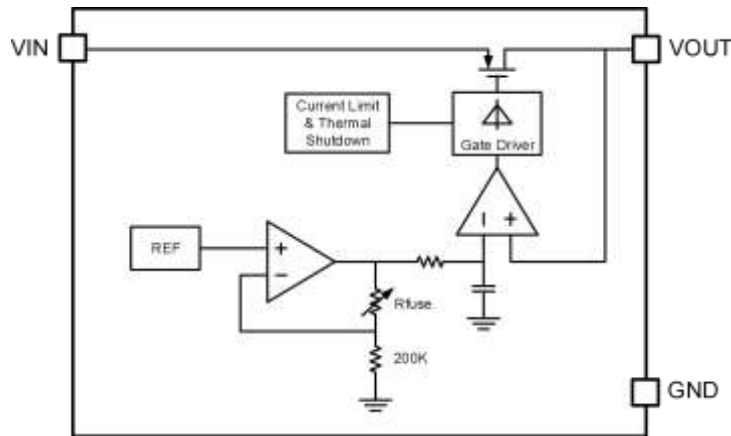


Figure 3(B), Typical Application Block diagram of OCP2820WxxAD





300mA, Low Noise, High PSRR CMOS LDO

■ Absolute Maximum Ratings¹ (T_A=25°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(Only DFN Package)	V _{EN}	-0.3 to V _{IN}	V
Maximum Load Current	I _{OUT}	400	mA
Human Body Model	HBM	2	kV
Charged Device Model	CDM	0.5	kV
Storage Temperature Range	T _S	-55 to +150	°C
Maximum Operating Junction Temperature Range	T _J	-40 to 125	°C

■ Recommended Operating Conditions²(T_A=25°C unless otherwise noted)

Parameter	Symbol	Rating	Unit
Input Voltage	V _{IN}	2.2 ~ 5.5	V
Ambient Operating Temperature	T _A	-40 to 85	°C
Thermal Resistance (DFN1010-4L)	R _{θJA}	198	°C/W
Thermal Resistance (SOT23)	R _{θJA}	218	°C/W



■ Electrical Characteristics

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{IN}	Input Voltage		2.2		5.5	V
V_{OUT}	Output Voltage	$I_{\text{OUT}}=1\text{mA}$	$0.97^* V_{\text{OUT}}$	V_{OUT}	$1.03^* V_{\text{OUT}}$	V
I_{LIM}	Current Limit		300			mA
V_{DROP}	Dropout Voltage ³	$V_{\text{OUT}}=3.3\text{V}$, $I_{\text{OUT}}=300\text{mA}$	DFN1010-4L	220	330	mV
			SOT23	260	350	
		$V_{\text{OUT}}=2.5\text{V}$, $I_{\text{OUT}}=300\text{mA}$	DFN1010-4L	280	420	
			SOT23	340	450	
		$V_{\text{OUT}}=1.8\text{V}$, $I_{\text{OUT}}=300\text{mA}$	DFN1010-4L	400	600	
			SOT23	480	650	
		$V_{\text{OUT}}\leq 1.2\text{V}$, $I_{\text{OUT}}=300\text{mA}$	DFN1010-4L	$V_{\text{in_min}}=2.2\text{V}$		
			SOT23			
Reg _{-LINE}	Line Regulation	$V_{\text{IN}}=2.2\text{V}\sim 5.5\text{V}$, $I_{\text{OUT}}=1\text{mA}$		0.01	0.1	%/V
Reg _{-LOAD}	Load Regulation	$V_{\text{OUT}}=1.2\text{V}$, $I_{\text{OUT}}=1\sim 300\text{mA}$	DFN1010-4L	10	30	mV
			SOT23	30	50	
I_{SHDN}	Shut-down Current	$V_{\text{EN}}=0\text{V}$			1	μA
I_{Q}	Quiescent Current	$V_{\text{OUT}}=1.2\text{V}$, $I_{\text{OUT}}=0\text{mA}$		40	60	μA
I_{SHORT}	Short Current Limit	$V_{\text{OUT}}=0\text{V}$		160		mA
PSRR	Power Supply Rejection Rate	$V_{\text{IN}}=(V_{\text{OUT}}+1\text{V})\text{DC}+0.5\text{V}_{\text{P-P}}$, $F=217\text{Hz}$, $I_{\text{OUT}}=10\text{mA}$, $C_{\text{OUT}}=1\mu\text{F}$		70		dB
		$V_{\text{IN}}=(V_{\text{OUT}}+1\text{V})\text{DC}+0.5\text{V}_{\text{P-P}}$, $F=1\text{kHz}$, $I_{\text{OUT}}=10\text{mA}$, $C_{\text{OUT}}=1\mu\text{F}$		68		
e_{no}	Output Voltage Noise	$F=10\text{Hz}$ to 100kHz , $I_{\text{OUT}}=10\text{mA}$, $V_{\text{OUT}}=1.2\text{V}$, $C_{\text{OUT}}=1\mu\text{F}$		40		μV_{RMS}
V_{IH}^4	EN Input Logic High	$V_{\text{IN}}: 2.2\text{V}$ to 5.5V	1.2			V
V_{IL}^4	EN Input Logic Low	$V_{\text{IN}}: 2.2\text{V}$ to 5.5V			0.4	V
R_{PD}	EN pull-down resistance		0.6	1	1.3	$\text{M}\Omega$
R_{DIS}	RON of Discharge path	$V_{\text{IN}}=4\text{V}$, $V_{\text{EN}}=0\text{V}$		137		Ω
TSHDN	Thermal-Shutdown Temperature			160		$^{\circ}\text{C}$
TSDH	Thermal Shutdown Hysteresis			30		$^{\circ}\text{C}$

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.
2. The device is not guaranteed to function outside of its operating conditions
3. V_{DROP} is measured with $V_{\text{OUT}} = 0.97 \times V_{\text{OUT}}(\text{nom})$.
4. V_{IH} & V_{IL} are only for DFN and SOT23-5 package.



■ 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 OCP2820 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

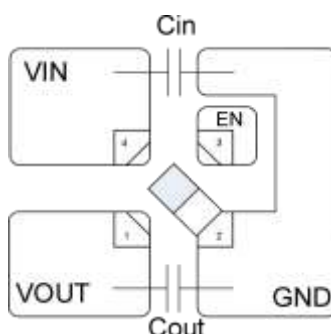


Figure 4(A), Recommended PCB Layout of OCP2820VxxAD

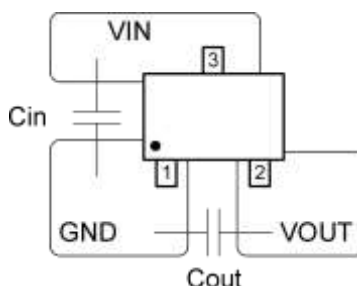


Figure 4(B), Recommended PCB Layout of OCP2820WxxAD

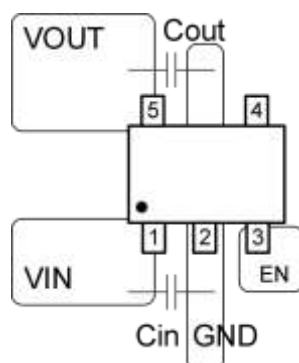
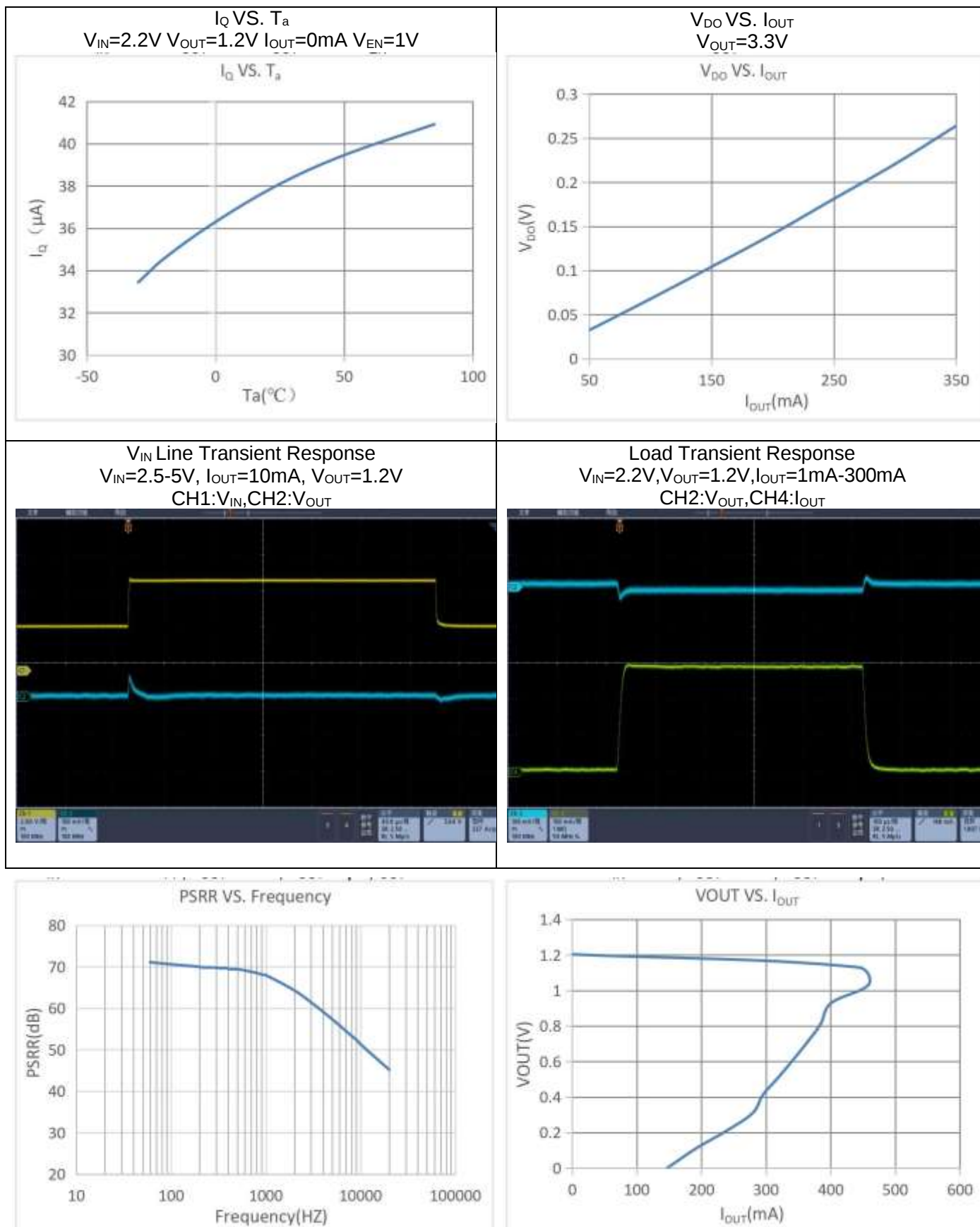


Figure 4(C), Recommended PCB Layout of OCP2820WExxAD



Electrical Characteristics

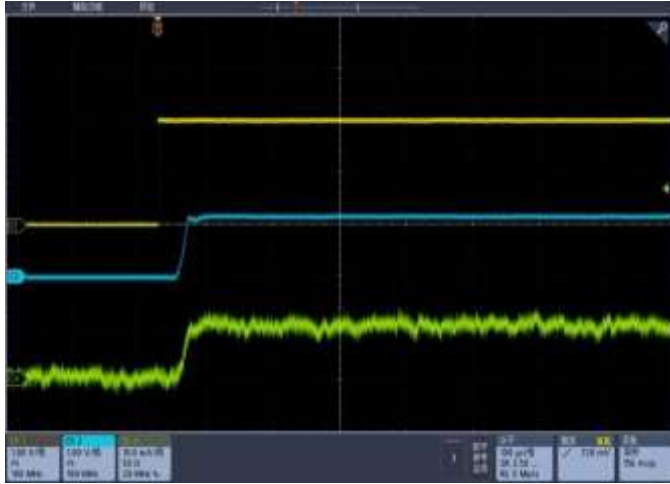




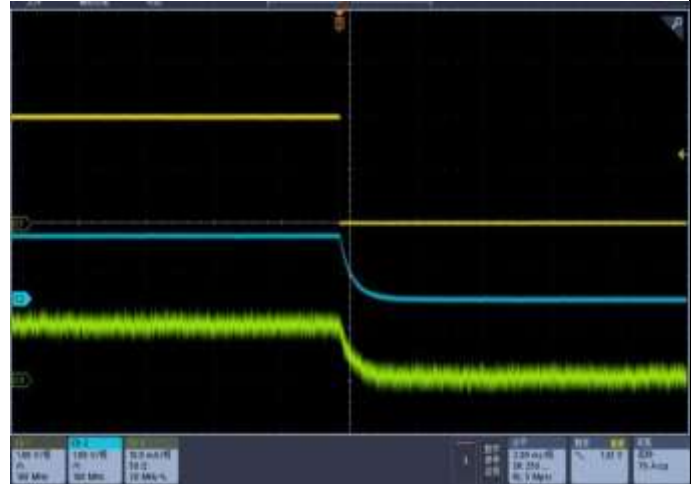
PSRR VS. Frequency $V_{IN}=2.2V+0.5V_{PP}, V_{OUT}=1.2V, C_{OUT}=1\mu F, I_{OUT}=10mA$	V_{OUT} VS. I_{OUT} $V_{IN}=2.2V, V_{OUT}=1.2V, C_{OUT}=4.7\mu F,$
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Enable Transient Response
 $V_{IN}=2.2V$, $I_{OUT}=10mA$, $C_{IN}=1\mu F$,
 $C_{OUT}=1\mu F$, $V_{OUT}=1.2V$
CH1:EN, CH2: V_{OUT} , CH3: I_{OUT}

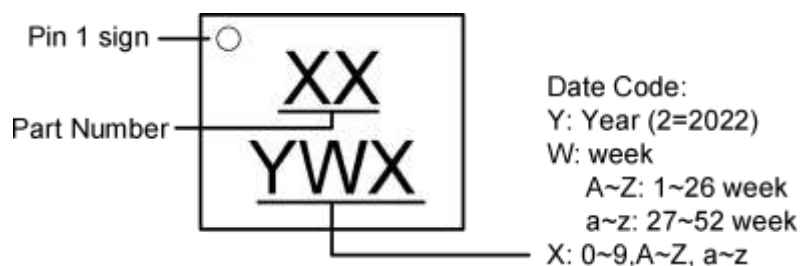


Enable Transient Response
 $V_{IN}=2.2V$, $I_{OUT}=10mA$, $C_{IN}=1\mu F$,
 $C_{OUT}=1\mu F$, $V_{OUT}=1.2V$
CH1:EN, CH2: V_{OUT} , CH3: I_{OUT}

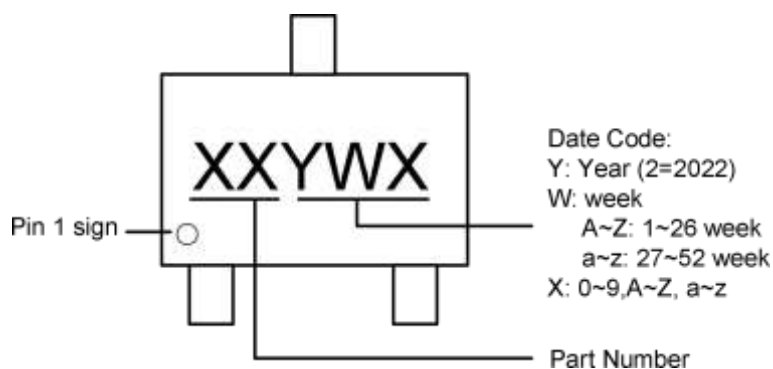


■ Marking Information

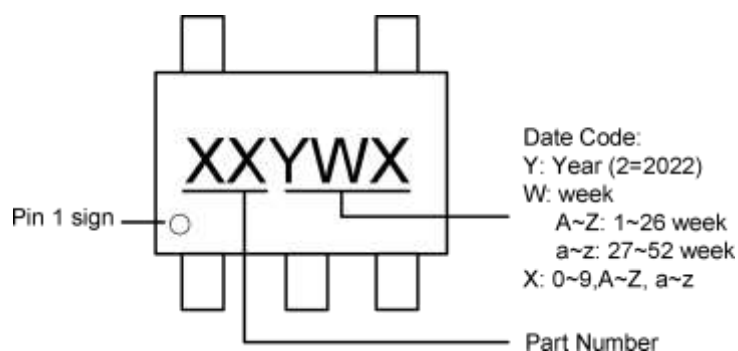
DFN1010-4L



SOT23-3L

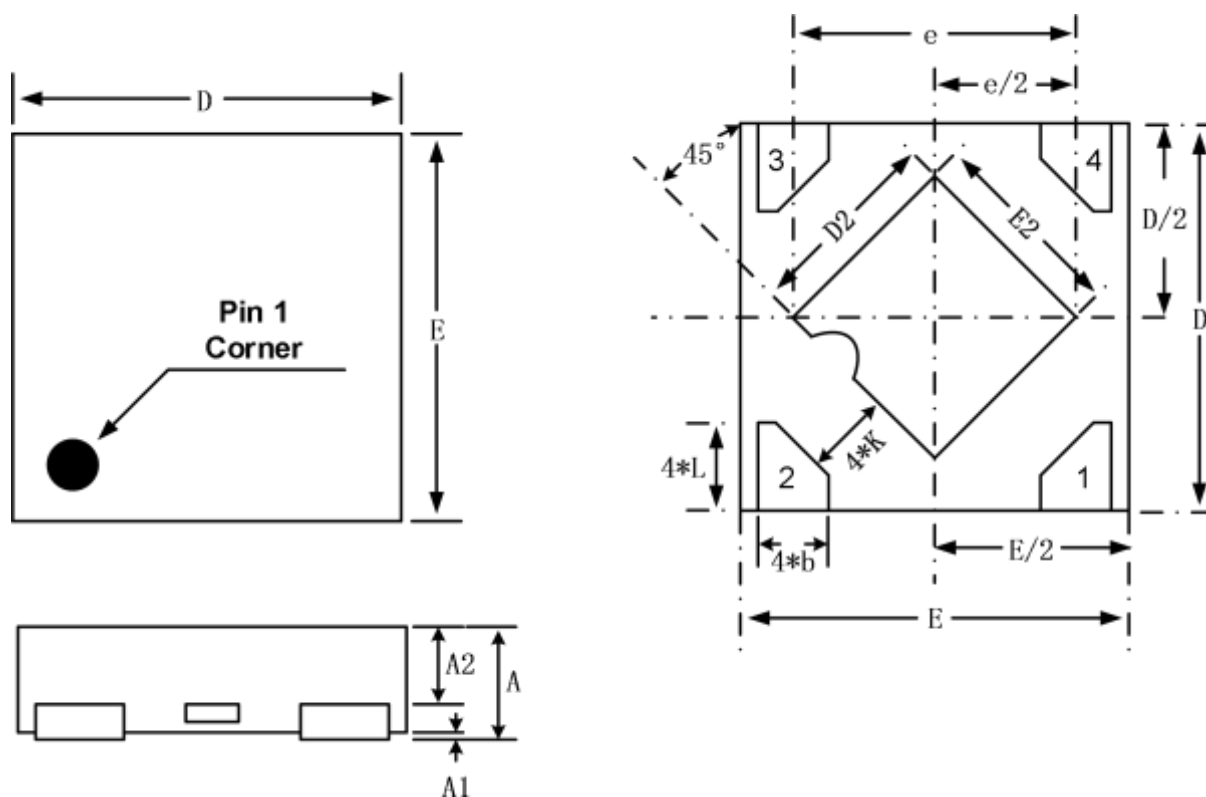


SOT23-5L



■ Package Information

DFN1010-4L

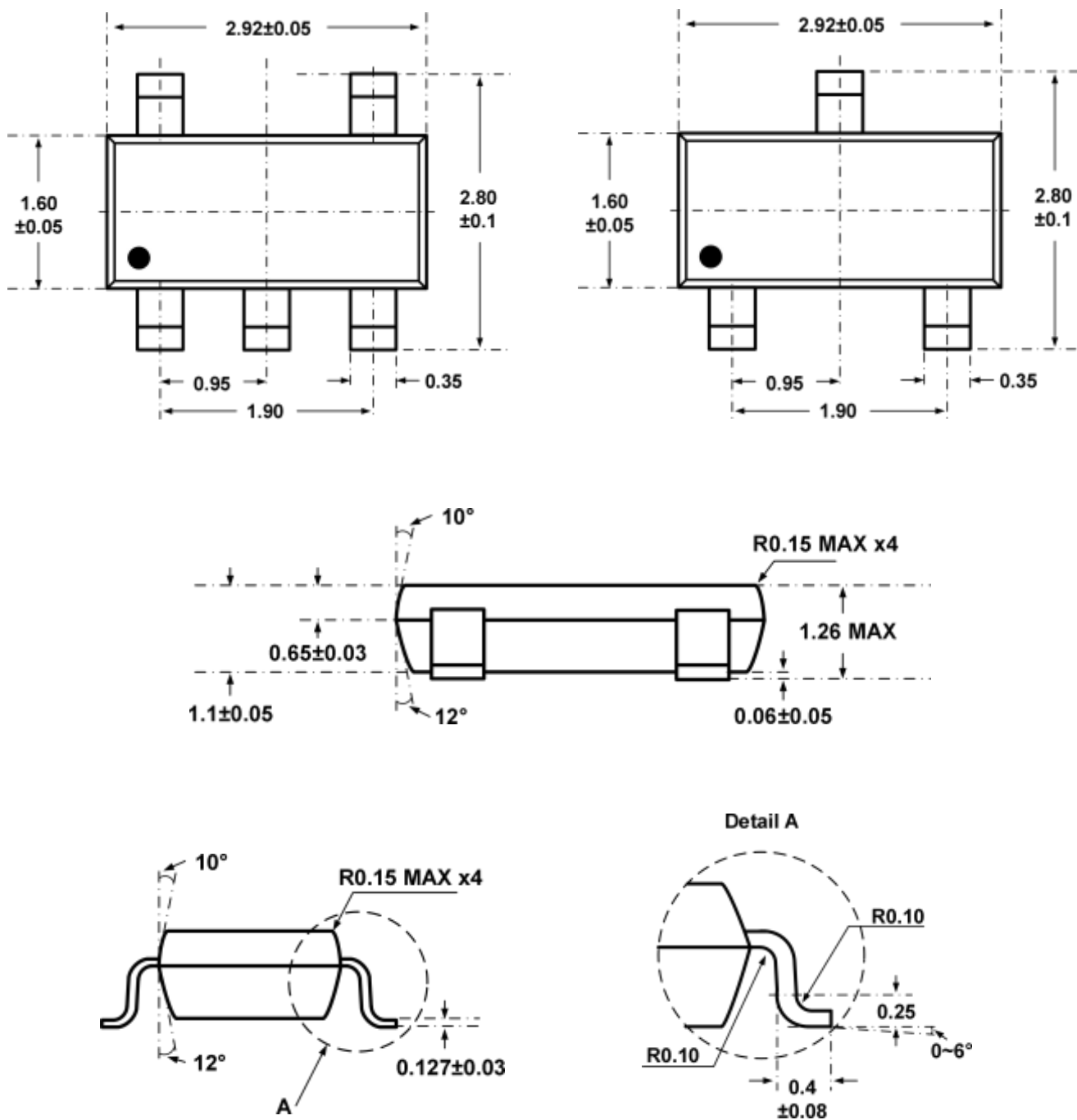


Symbol	Dimensions In Millimeters		
	Min.	Nom.	Max.
A	0.355	0.385	0.405
A1	0.00	0.02	0.05
A2	-	0.26	-
b	0.18	0.23	0.28
D	1 BSC		
E	1 BSC		
e	0.65 BSC		
D2	0.44	0.49	0.54
E2	0.44	0.49	0.54
L	0.20	0.25	0.30
K	0.21 REF		



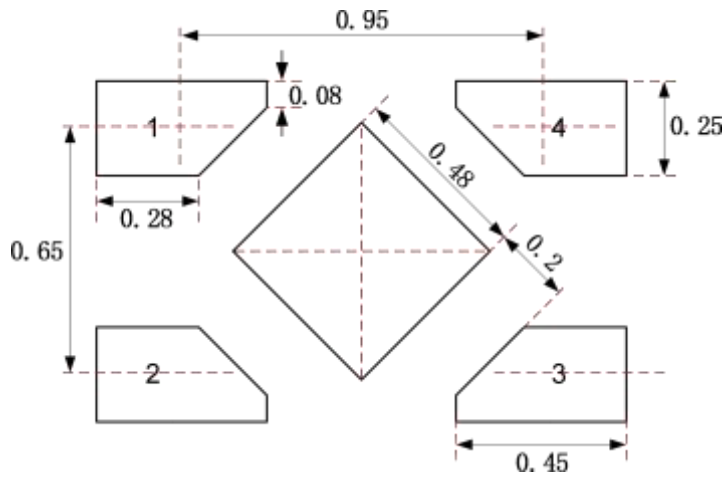
■ Package Information

SOT23-5L/SOT23-3L

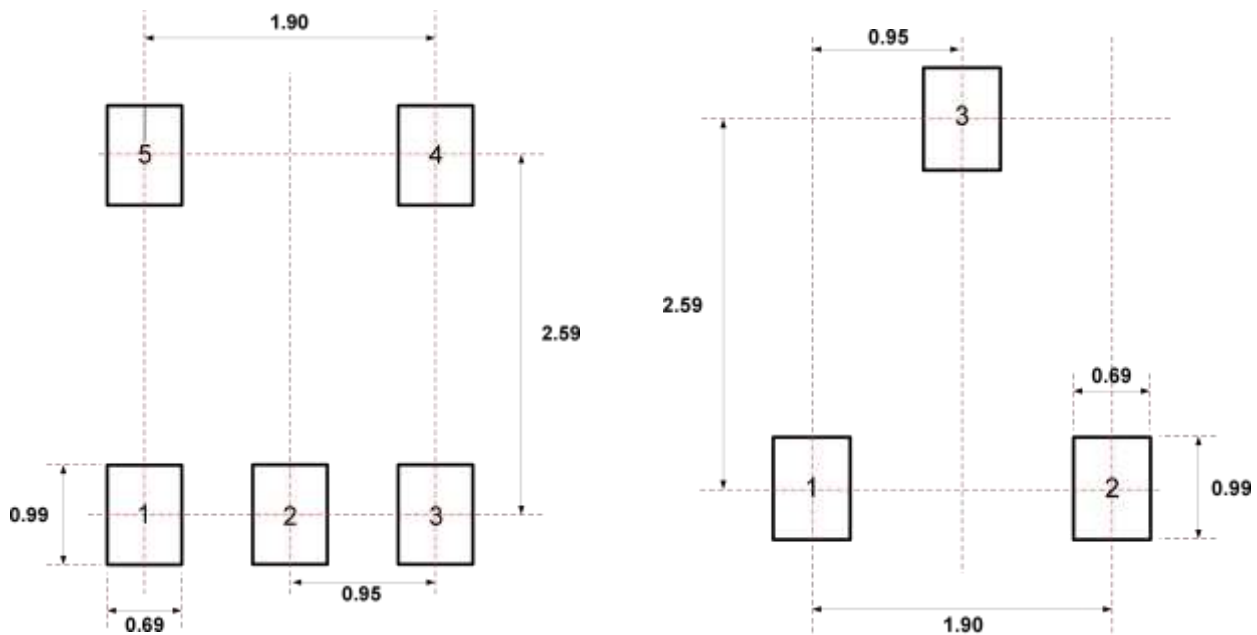


NOTE: All dimensions are in millimeters(mm).

■ **Land Pattern Data**
DFN1010-4L



SOT23-5L/SOT23-3L

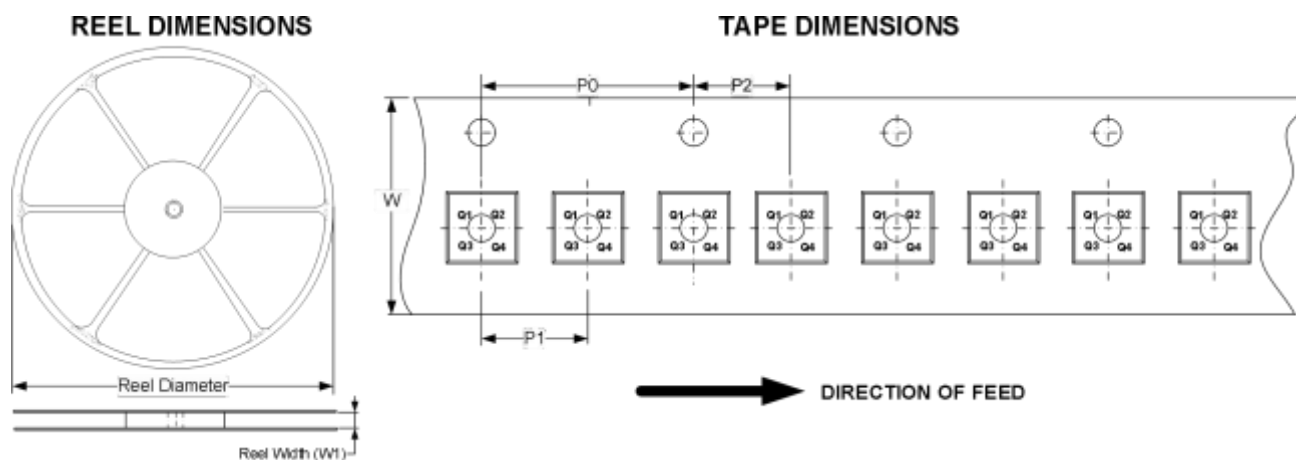


NOTE: All dimensions are in millimeters(mm).



■ Packing Information

DFN1010-4L & SOT23-3L & SOT23-5L



Package Type	SPQ	Reel Diameter (mm)	Reel Width W1(mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	PIN 1 Quadrant	MSL
DFN1010-4L	10000	180.0	8.5	4.0	2.0	2.0	8.0	Q1	Level-1-260C
SOT23-3L	3000	180.0	8.5	4.0	4.0	2.0	8.0	Q3	Level-3-260C
SOT23-5L	3000	180.0	8.5	4.0	4.0	2.0	8.0	Q3	Level-3-260C

Note: Carrier Tape Dimension, Reel Size and Packing Minimum



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