



High Efficiency 2.5MHz, 1A Synchronous Step Down Regulator

General Description

OR1281 is a high efficiency 2.5MHz synchronous step down DC/DC regulator IC capable of delivering up to 1A output currents. It can operate over a wide input voltage range from 2.5V to 5.5V and integrate main switch and synchronous switch with very low $R_{DS(ON)}$ to minimize the conduction loss.

Ordering Information

OR1281 □(□□)□
 └─ Temperature Code
 └─ Package Code
 └─ Optional Spec Code

Ordering Number	Package Type	Note
OR1281YBC	DFN1.5×1.5-6	1A

Features

- Low $R_{DS(ON)}$ for internal switches (top/bottom) 230mΩ/150mΩ
- 2.5~5.5V input voltage range
- High switching frequency 2.5MHz minimizes the external components
- Internal soft-start limits the inrush current
- 100% dropout operation
- RoHS Compliant and Halogen Free
- Output auto discharge function
- Compact package: DFN1.5x1.5-6

Applications

- Portable Navigation Device
- Set Top Box
- USB Dongle
- Media Player
- Smart phone

Typical Applications

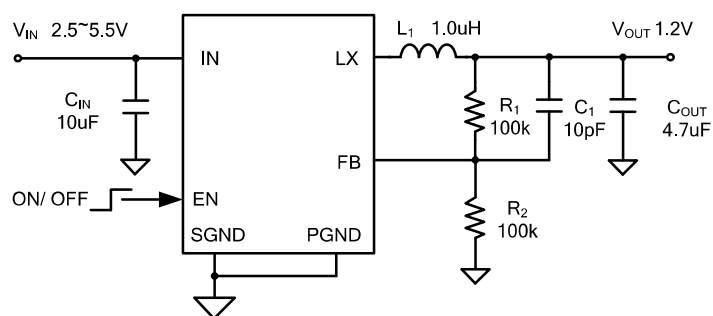
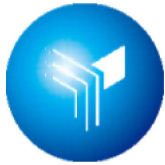
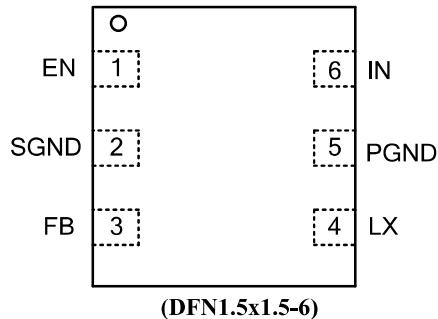


Figure1. Schematic Diagram



Pinout (Top View)



Top Mark: MNxyz (device code: MN, x=year code, y=week code, z=lot number code)

Pin Name	Pin Number	Pin Description
EN	1	Enable control. Pull high to turn on. Do not float.
PGND	5	Power ground pin.
SGND	2	Signal ground pin.
LX	4	Inductor pin. Connect this pin to the switching node of inductor.
IN	6	Input pin. Decouple this pin to GND pin with at least 10uF ceramic cap.
FB	3	Output Feedback Pin. Connect this pin to the center point of the output resistor divider (as shown in Figure 1) to program the output voltage: $V_{OUT}=0.6*(1+R_1/R_2)$.

Absolute Maximum Ratings (Note 1)

Supply Input Voltage ----- 6.0V
Enable, FB Voltage----- $V_{IN} + 0.6V$
Power Dissipation, P_D @ $T_A = 25^\circ C$,
DFN1.5x1.5-6 ----- 1.6 W
Package Thermal Resistance (Note 2)
 θ_{JA} ----- TBD
 θ_{JC} -----TBD
Junction Temperature Range -----125°C
Lead Temperature (Soldering, 10 sec.) ----- 260°C
Storage Temperature Range ----- -65°C to 150°C

Recommended Operating Conditions (Note 3)

Supply Input Voltage ----- 2.5V to 5.5V
Junction Temperature Range ----- -40°C to 125°C
Ambient Temperature Range ----- -40°C to 85°C



Electrical Characteristics

($V_{IN} = 5V$, $V_{OUT} = 2.5V$, $L = 1.0\mu H$, $C_{OUT} = 4.7\mu F$, $T_A = 25^\circ C$, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Voltage Range	V_{IN}		2.5		5.5	V
Quiescent Current	I_Q	$I_{OUT}=0$, $V_{FB}=V_{REF} \cdot 105\%$		40		μA
Shutdown Current	I_{SHDN}	$EN=0$		0.1	1	μA
Feedback Reference Voltage	V_{REF}		0.588	0.6	0.612	V
FB Input Current	I_{FB}	$V_{FB}=V_{IN}$	-50		50	nA
PFET RON	$R_{DS(ON),P}$			230		m Ω
NFET RON	$R_{DS(ON),N}$			150		m Ω
PFET Current Limit	I_{LIM}		1.3			A
EN rising threshold	V_{ENH}		1.5			V
EN falling threshold	V_{ENL}				0.4	V
Input UVLO threshold	V_{UVLO}				2.5	V
UVLO hysteresis	V_{HYS}			0.1		V
Oscillator Frequency	F_{OSC}			2.5		MHz
Min ON Time				65		ns
Max Duty Cycle			100			%
Soft Start Time	T_{SS}			1		ms
Thermal Shutdown Temperature	T_{SD}			160		$^\circ C$
Thermal Shutdown Hysteresis	T_{HYS}			15		$^\circ C$
Output discharge resistor	R_{DSC}			120		Ω
PFM Model Operation	I_{PFM}	$V_{IN}=3.6V$, $V_{OUT}=3.3V$, $L=1.0\mu H$.		100		mA

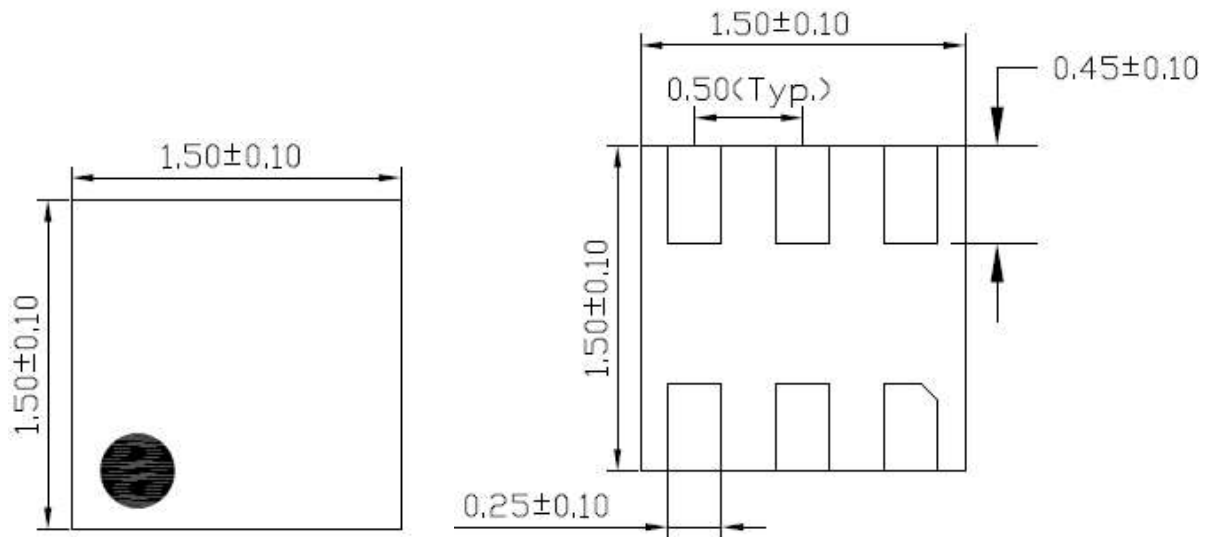
Note 1: Stresses beyond the “Absolute Maximum Ratings” may cause permanent damage to the device. These are for stress ratings. Functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may remain possibility to affect device reliability.

Note 2: θ_{JA} is measured in the natural convection at $T_A = 25^\circ C$ on a low effective single layer thermal conductivity test board of JEDEC 51-3 thermal measurement standard. Exposed Paddle of DFN package is the case position for θ_{JC} measurement.

Note 3: The device is not guaranteed to function outside its operating conditions.

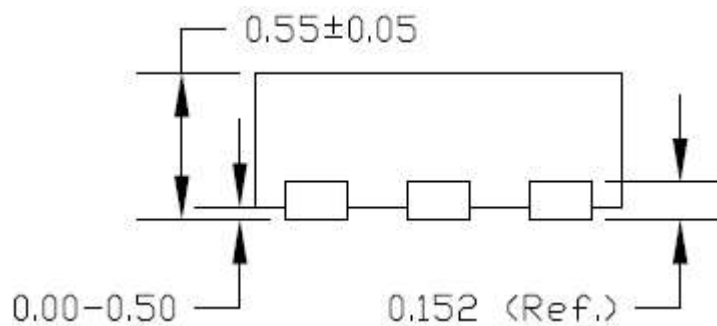


DFN1.5x1.5-6L Package Outline



Top View

Bottom View



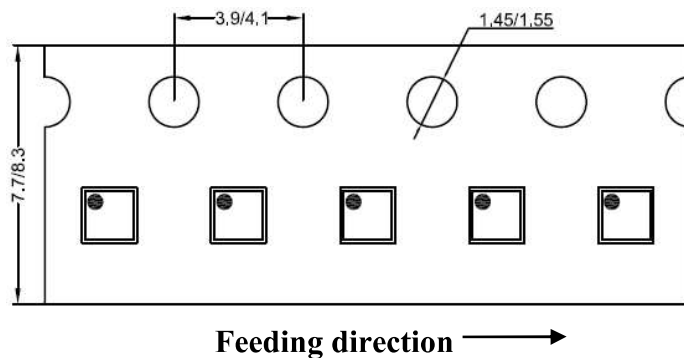
Side View

Notes: All dimension in MM and exclude mold flash & metal burr.

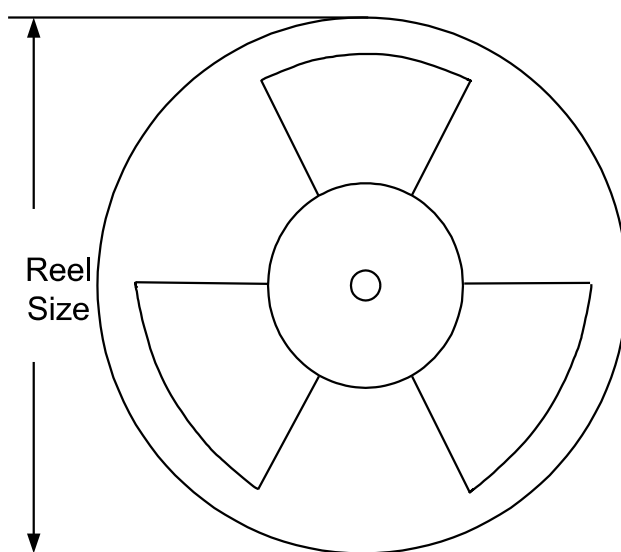


Taping & Reel Specification

1. DFN 1.5x1.5-6 taping orientation



2. Carrier Tape & Reel specification for packages



Package types	Tape width (mm)	Pocket pitch(mm)	Reel size (Inch)	Trailer length(mm)	Leader length (mm)	Qty per reel
DFN1.5x1.5	8	4	7"	400	160	3000

3. Others: NA