SMART DEFROST SOLUTION

FOR CONSUMER & COMMERCIAL APPLIANCES

NXP RF POWER

UNDER EMBARGO UNTIL

JANUARY 9, 2018

NXP

SECURE CONNECTIONS
FOR A SMARTER WORLD

NXP Smart Defrost Solution

Delivering High Quality Defrosting in a Convenient and Food Safe Manner

Consumer Food and Residential Kitchen Dynamics

Time Demands

Smart Kitchens

Fav Food

Spicy Sweet Potato Julienne Fries
"Ingredients that you're proud to serve your family."
Liss, from Tampa, FL
Alexia fans give it 4.8/5 stars

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REVIEWS ▶

ALEXIA
spicy
SWEET
POTATO
fries

Quest For Health

New Healthy Brands Emerging

NXP

Challenges In Defrosting Frozen Foods

Defrosting Food Challenges

- **Duration**
  - Air or water methods take hours; inconvenient

- **Attention**
  - Continuous "hovering" to monitor progress increases inconvenience

- **Food Safety**
  - Bacterial growth risk when surface temperature exceeds 40F/4C

- **Quality**
  - Hot spots and cold spots when using conventional microwave oven
  - Moisture loss reduces nutritional content

SMART
DEFROST

Introducing NXP's Smart Defrost Solution

Uses RF technology to deliver fast, high quality and safe defrosting. Streamlining this important food preparation step can completely revolutionize the way we store, keep and consume food. Remove guess work and risk by using smart defrost.

Proven and reliable defrost in minutes, not hours

Complete food penetration without hot or cold spots, retaining moisture and food quality

Automatic single button operation that intelligently stops at target temperature

NXP Smart Defrost Solution: How Does It Work?

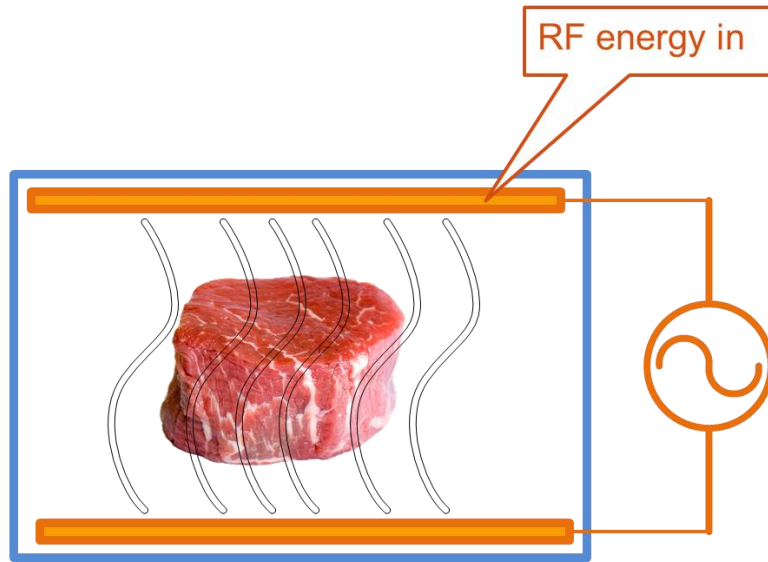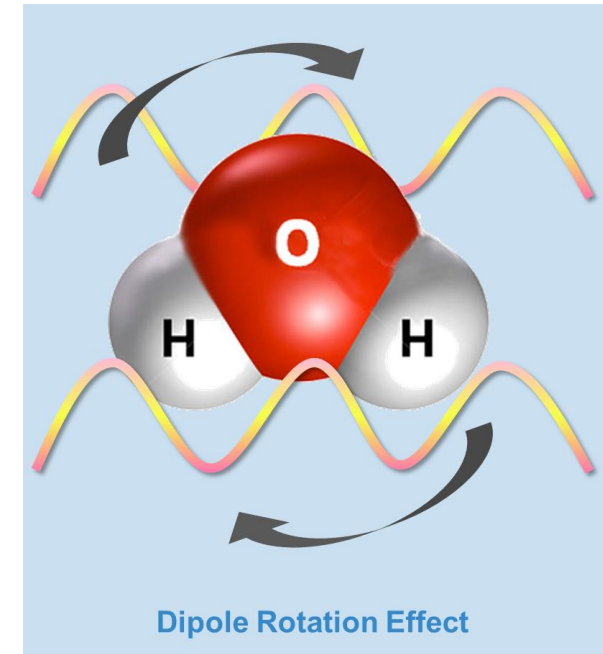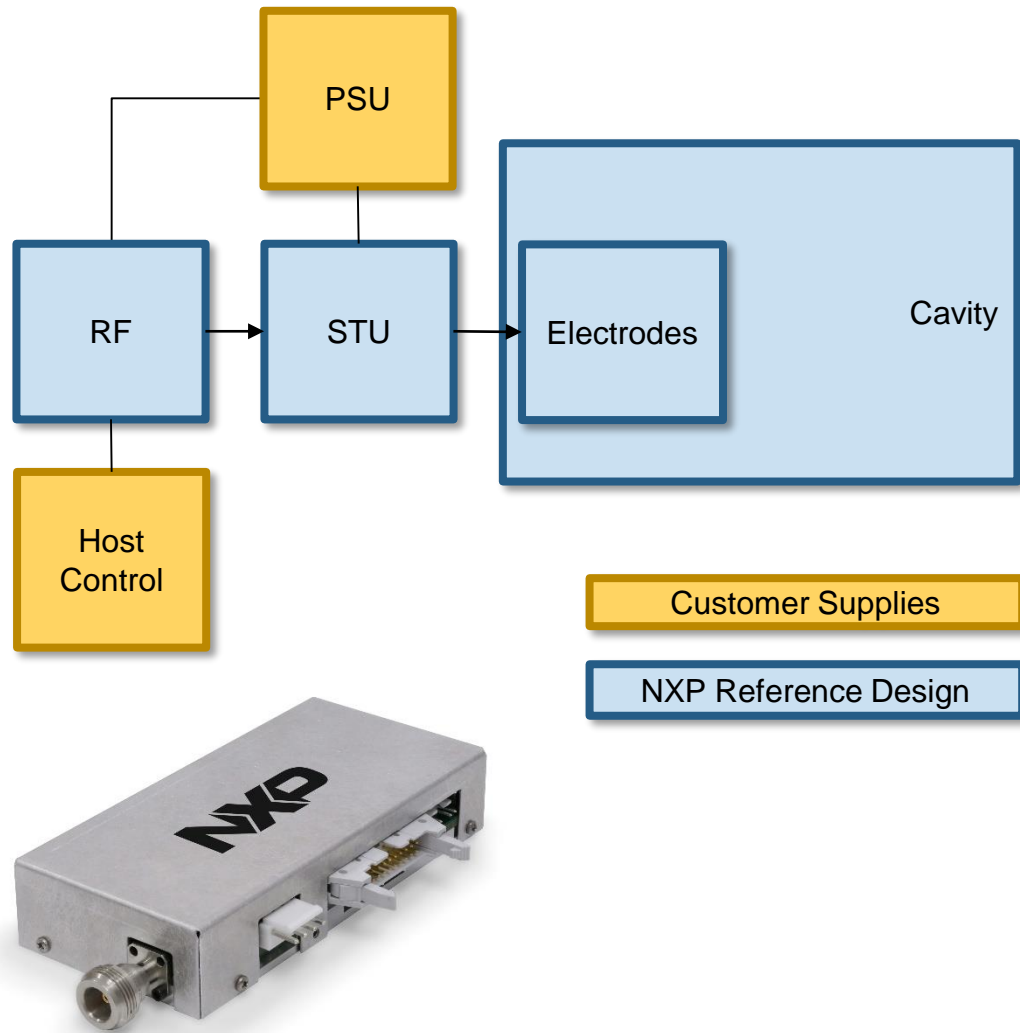## Solid state RF defrost solutions from NXP are safe and fast

RF energy in

Illustration: Concept Smart Defrost Cabinet

Dipole Rotation Effect

- Low frequency electromagnetic waves pass completely through food
- Molecule rotation and collisions create friction heat
- Heat propagates through food

NXP Smart Defrost Solution Features and Functionality

- **PSU** – power supply to convert wall power to useable DC voltages

- **RF** – creates the energy used to raise food temperature

- **Smart Tuning Unit (STU)** – intelligently adjusts operation for properties of the food within the defrost chamber

- **Electrodes** – provide the delivery of energy into the defrost cavity

- **Cavity** – shielded, enclosed space for defrosting frozen food

- **Host Control** – main appliance control and user input interface
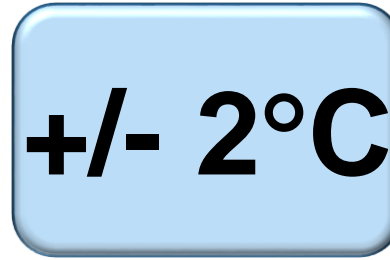
Benefits Of NXP Smart Defrost Solution

+/- 2°C

Automatic
- Single button operation
- Intelligent system stops at target temperature

Fast
- Minutes to defrost, not hours
- High efficiency
- Wide range of RF power available

Even
- No hot spots
- Complete food penetration
- Retains moisture, food quality

Economical
- Frozen food prevents spoilage
- Defrost on demand reduces risk to spoilage

Food Safe
- Closed loop monitoring
- OEM optional added cool air flow limits bacteria growth (<4C)

Easy, fast, even, economical, and food safe defrosting & thawing

Positive Implications for Food Producers and Consumers

Frozen Fruits & Veggies Aren't As Nutritious As Fresh

The FDA found that there is no difference in nutrition between frozen and fresh produce

All Frozen Foods Contain Preservatives

Food can be 'flash frozen' to preserve nutrition and preserve fresh foods

Frozen Meals Are Not Healthy

Fresh ingredients can be used in prepared frozen meals. Effective defrosting preserves their moisture and nutrition while making the food ready for consumption or cooking

Frozen Meals Aren't Environmentally Friendly

Frozen food is an economical means to storing food without risk of spoilage. An effective defrosting solution can reduce food wasted by spoilage

Frozen Food Myths

Ref: American Frozen Food Institute, NXP, Industry Sources

NXP Smart Defrost Solution enables healthier frozen food options for consumers without sacrificing convenience

Implementation Opportunities

Multiple Potential Implementations

Exterior Refrigerator Drawer

Standalone Countertop

Microwave/Convection Integration

Integrated Oven Drawer

Interior Refrigerator Drawer

Standalone Drawer Below Counter

- Stand alone functional appliances

- With or without circulating cool air

- Integrate with existing appliances