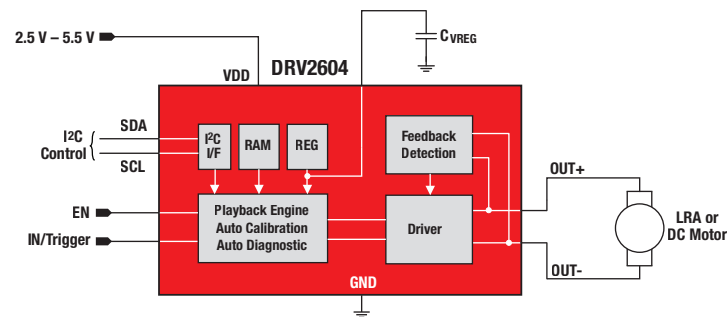## Evaluation Kit Contents

- DRV2604 LRA / ERM haptics driver with automatic overdrive and braking for ERM and LRAs

- Eccentric rotating mass motor (ERM)

- Linear resonant actuator (LRA)

- Programmable MSP430™ with haptic effects

- Capacitive touch buttons

- Mini-USB cable

Design Resources and References

TI E2E™ Community

E2E Touch Forum
ti.com/touchforum

Available on **ti.com/drv2604**
- DRV2604 datasheet
- Complete DRV2604EVM-CT User's Guide
- Schematics and layout
- EVM source code and binaries

Get more information on TI's solutions for touch-enabled applications at
ti.com/touch
- Watch videos
- Compare products
- Find companion products
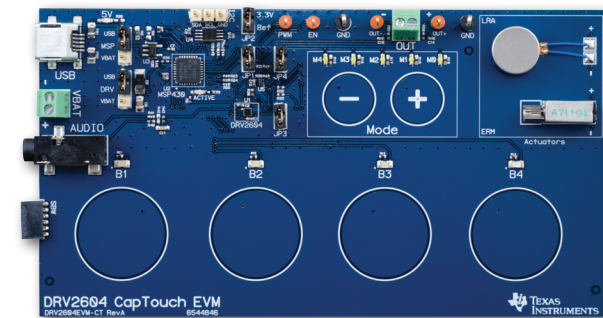- Download software
- Order samples and EVMs

SNOB005

DRV2604EVM-CT
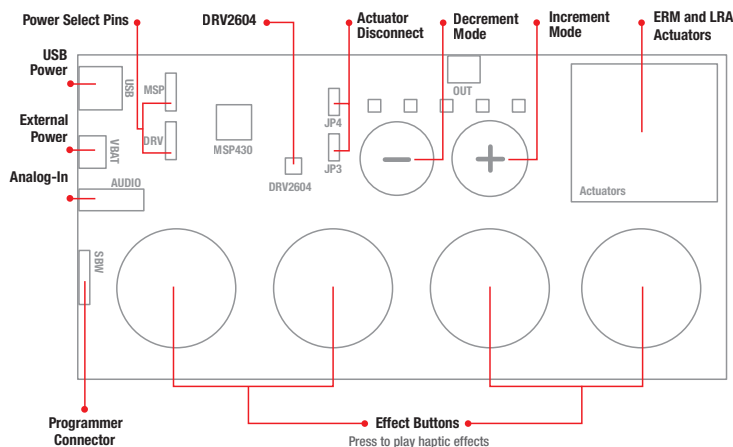## Quick-Start Guide

→ **Start Here**

TEXAS INSTRUMENTS

Getting Started

1. Verify jumpers MSP and DRV, next to the USB connector, are connected to the USB pin.

2. Plug the board into an available USB power source (computer or wall charger) using the included USB cable.

3. Board will enter a power up sequence and the 5 V indicator will light up.

4. Use the large buttons to play effects and the "+" and "-" buttons to switch between modes. Each mode has a different set of effects.


Power Select Pins
DRV2604
Actuator Disconnect
Decrement Mode
Increment Mode
ERM and LRA Actuators
USB Power
External Power
Analog-In
USB
MSP
DRV
VBAT
AUDIO
MSP430
DRV2604
OUT
JP4
JP3
Actuators
SBW
Programmer Connector
Effect Buttons
Press to play haptic effects

Mode and Effects

Mode	Button	Description	Actuator	Waveform Location	Interface
Mode Off LEDs Off	B1	Click + Bounce	ERM	RAM	Internal Trigger (I²C)
	B2	Ramp Up + Click	LRA		
	B3	Gallop Alert	ERM		
	B4	Pulsing Alert	LRA		
Mode 4 LED M4 On	B1	StrongClick	ERM	RAM	Ext. Level Trig.
	B2	Bump + Release			Internal Trigger
	B3	Double Strong Click			Ext. Edge Trig.
	B4	Click (Open Loop)		µController	PWM
Mode 3 LED M3 On	B1	StrongClick	LRA	RAM	Ext. Level Trig.
	B2	Bump + Release			Internal Trigger
	B3	Double Strong Click			Ext. Edge Trig.
	B4	Click (Open Loop)		µController	PWM
Mode 2 LED M2 On	B1	Buzz Auto-Resonance ON	LRA	µController	RTP (I²C)
	B2	Buzz Auto-Resonance OFF	LRA		PWM
	B3	Buzz Alert	ERM		PWM
	B4	Scroll Wheel	LRA		RTP (I2C)
Mode 1 LED M1 On	B1	Concentration Game The board will display a pattern using the effect buttons. See how many times you can repeat the pattern as it increases by one effect each time.	ERM & LRA	RAM	Internal Trigger (I²C)
	B2				
	B3				
	B4				
Mode 0 LED M0 On	B1	Auto-Calibration	ERM	Internal Routine	Internal Trigger (I²C)
	B2	Auto-Calibration	LRA		
	B3	Click	ERM/LRA	RAM	Internal Trigger (I²C)
	B4	Buzz			

Features and Benefits

Embedded RAM
Integrated RAM can store over 100 customized waveforms that can be triggerred via I²C or a GPIO
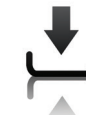
Immersion-Compatible
Works seamlessly with Immersion TouchSense® 3000

Smart Loop Architecture

Auto-Resonance Detection
Automatically track the resonant frequency of an LRA; maximize vibration strength and improve consistency across devices
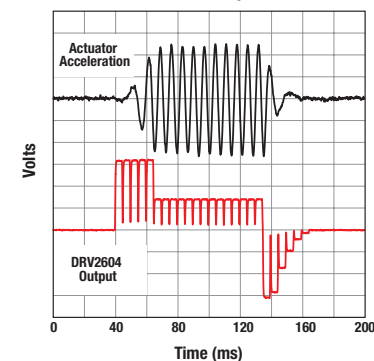
Automatic Diagnostics
Automatically detect the status of the actuator

Automatic Calibration
Automatically detect and configure the closed-loop feedback coefficients for every actuator

Closed Loop Feedback
Improve the response time of ERM and LRA actuators with automatic overdrive and braking

ERM Closed Loop Buzz

Actuator Acceleration
DRV2604 Output
Volts
Time (ms)
0   40   80   120   160   200

IMPORTANT NOTICE

Products		Applications	
Audio	www.ti.com/audio	Automotive and Transportation	www.ti.com/automotive
Amplifiers	amplifier.ti.com	Communications and Telecom	www.ti.com/communications
Data Converters	dataconverter.ti.com	Computers and Peripherals	www.ti.com/computers
DLP® Products	www.dlp.com	Consumer Electronics	www.ti.com/consumer-apps
DSP	dsp.ti.com	Energy and Lighting	www.ti.com/energy
Clocks and Timers	www.ti.com/clocks	Industrial	www.ti.com/industrial
Interface	interface.ti.com	Medical	www.ti.com/medical
Logic	logic.ti.com	Security	www.ti.com/security
Power Mgmt	power.ti.com	Space, Avionics and Defense	www.ti.com/space-avionics-defense
Microcontrollers	microcontroller.ti.com	Video and Imaging	www.ti.com/video
RFID	www.ti-rfid.com		
OMAP Applications Processors	www.ti.com/omap	**TI E2E Community**	e2e.ti.com
Wireless Connectivity	www.ti.com/wirelessconnectivity		