

Product Brief



SEMTECH ADVANCED COMMUNICATIONS & SENSING



SX8651/53/74/75/76/77/78

World's First Haptics Enabled, Multi-touch Resistive Touchscreen Controller with Proximity Sensing and $\pm 15\text{kV}$ ESD Protection

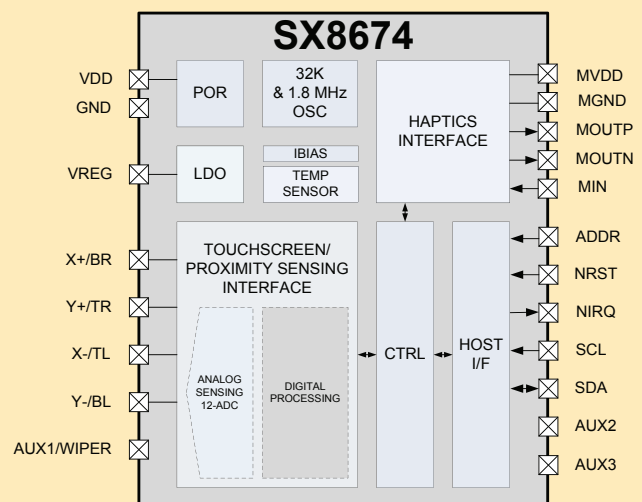
Key Product Features

- Low Power Operation
 - 1.65V to 3.7V (SX8651/53)
 - 2.3V to 3.6V (SX8674/75/76/77/78)
 - 30 μA @ 2.3V 8ksp/s
 - 0.4 μA stand-by current
- 4/5-wire touchscreen interface with programmable digital filtering/averaging
- Support various multi-touch gestures such as pinch/stretch/rotate on low cost 4-wire resistive touchscreen
- Fully programmable proximity sensing (SX8674/76)
 - > 5cm detection distance
 - No additional components required
- Built-in haptics driver for LRA and ERM (SX8674/75)
 - Up to 250 mA drive capability
 - Short circuit and over temperature protection
- On-chip ESD protection up to $\pm 15\text{kV}$
- Ultra small footprint solution:
 - SX8651/53:** 1.46 mm x 1.96 mm 12-WLCSP and 3mm x 3mm 12-DFN/4mm x 3mm 14-DFN
 - SX8674/75/76/77/78:** 2.07mm x 2.07mm 19-WLCSP and 4mm x 4mm 20-QFN
- Dedicated hardware reset pin
- 400kHz I²C interface

Applications

- Game machines, portable music players
- Mobile phones
- DSC
- GPS
- Conference Phone
- Home Appliance Control Panels
- POS/POI terminals
- Touch-screen monitors

Block Diagram

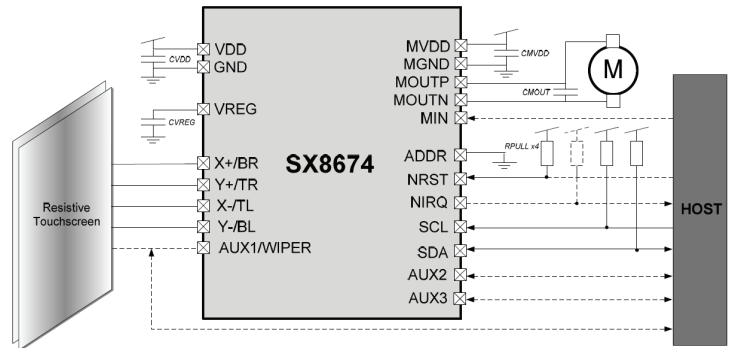


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Part Number	Package	Multi-touch	Prox	Haptics
SX8651IWLTRT	3x3mm DFN-12	x		
SX8651ICSTRT	1.46x1.96mm WLCSP-12	x		
SX8653IWLTRT	4x4mm DFN-14	x		
SX8653ICSTRT	1.46x1.96mm WLCSP-12	x		
SX8674IWLTRT	4x4mm QFN-20	x	x	Generic
SX8674ICSTRT	2.07x2.07mm WLCSP-19	x	x	Generic
SX8675IWLTRT	4x4mm QFN-20	x		Generic
SX8675ICSTRT	2.07x2.07mm WLCSP-19	x		Generic
SX8676IWLTRT	4x4mm QFN-20	x	x	
SX8676ICSTRT	2.07x2.07mm WLCSP-19	x	x	
SX8677IWLTRT	4x4mm QFN-20	x	x	Immersion
SX8677ICSTRT	2.07x2.07mm WLCSP-19	x	x	Immersion
SX8678IWLTRT	4x4mm QFN-20	x		Immersion
SX8678ICSTRT	2.07x2.07mm WLCSP-19	x		Immersion

Typical Applications Circuit



Electrical Characteristics

Symbol	Description	Condition	Min	Typ	Max	Unit
Supply						
VDD	Main supply voltage		2.3	-	3.6	V
IDD	Main supply current	OFF (MAN mode, no command, HAPT OFF)	-	0.4	0.75	µA
		WAIT (PENDET/TRG mode, pen up, PROX OFF, HAPT OFF)	-	1.7	-	
		TOUCH1 (PENTRG mode, pen down, X+Y, RATE=4kcps, Nfilt=1, POWDLY=0.5us, touchscreen current excluded, HAPT OFF, VDD=2.3V)	-	30	-	
		TOUCH2 (PENTRG mode, pen down, X+Y, RATE=3kcps, Nfilt=7, POWDLY=0.5us, touchscreen current excluded, HAPT OFF)	-	120	160	
		PROX (PENDET/TRG mode, pen up, TOUCHRATE=80cps, PROX ON, SCANPERIOD=200ms, HIGHIM=ON, SENSITIVITY=Max, FREQ=150kHz, BOOST=OFF, HAPT OFF)	-	8	20	
		HAPT (MAN mode, no command, LRA-PWM mode, MIN= 44.8kHz/50%, GAIN = Max, BW = 100, MOUTP/N floating, Squelch=011)	-	115	145	
MVDD	Haptics supply voltage		VDD	-	3.6	V
MIDD	Haptics supply current	OFF	-	0.01	1	µA
		SQUELCH (LRA-PWM mode, MIN= 44.8kHz/50%, GAIN = Max, BW = 100, MOUTP/N floating, Squelch=011)	-	6	10	µA

Visit our website to locate the most current product specifications, datasheets and contact information for your local Semtech Field Applications Engineer. SX8674-PB-1011