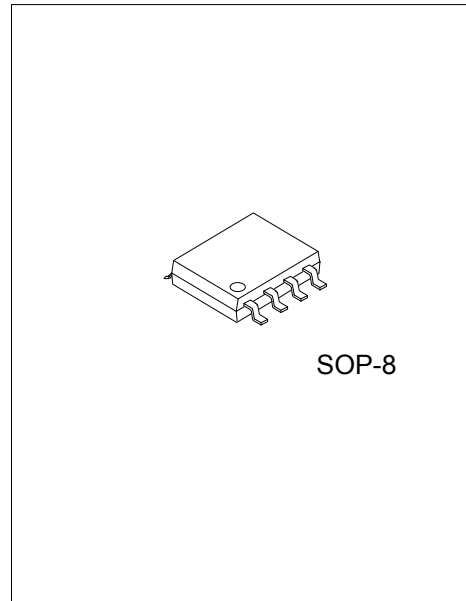




# 0.5A SINGLE CHANNEL CURRENT-LIMITED POWER SWITCH



SOP-8

#### DESCRIPTION

The UTC **US212** is integrated high-side power switches optimized for Universal Serial Bus (USB) and other hot-swap applications. The UTC **US212** complies with USB 2.0. Both polarities of Enable input are available. The UTC **US212** offers current and thermal limiting and short circuit protection, as well as controlled rise time and under-voltage lockout functionality. The open-drain Flag output with a pull-up resistance to IN have a blanking time, 7ms typically, for preventing false over-current reporting, and does not require any external components.

The UTC **US212** is generally used in LCD TVs & Monitors, Game Machines, Set-Top-Boxes, GPS Systems, Smartphones, Laptops, Desktops, Servers, Printers, Docking Stations, HUBs and so on.

#### FEATURES

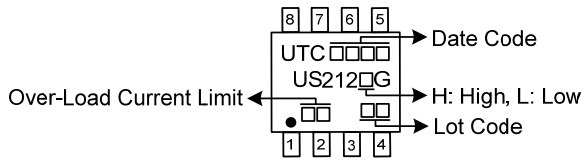
- \* Single USB Port Power Switches
- \* Over-Current and Thermal Protection
- \* 0.8A Accurate Current Limiting
- \* Reverse Current Blocking
- \* 110 mΩ On-Resistance
- \* Input Voltage Range: 2.7V~5.5V
- \* 0.6ms Typical Rise Time
- \* Very Low Shutdown Current: 1μA (max)
- \* Fault Report (FLG) with 7ms deglitch capability
- \* Active High or Active Low Enable
- \* Ambient Temperature Range -40°C~+85°C

#### ORDERING INFORMATION

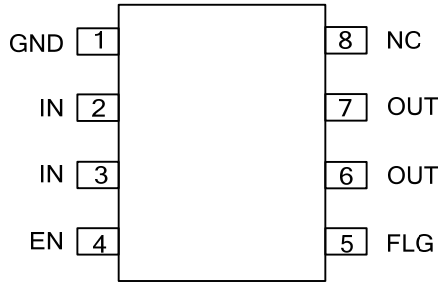
Ordering Number		Package	Packing
Lead Free	Halogen Free		
US212XL-xx-S08-R	US212XG-xx-S08-R	SOP-8	Tape Reel

<p>US212XL-xx-S08-R</p>	<ul style="list-style-type: none"> <li>(1) Packing Type</li> <li>(2) Package Type</li> <li>(3) Over-Load Current Limit</li> <li>(4) Green Package</li> <li>(5) EN Input Logic Voltage</li> </ul>	<ul style="list-style-type: none"> <li>(1) R: Tape Reel</li> <li>(2) S08: SOP-8</li> <li>(3) 08: 0.8V</li> <li>(4) G: Halogen Free and Lead Free</li> <li>(5) H: Active High, L: Active Low</li> </ul>
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MARKING



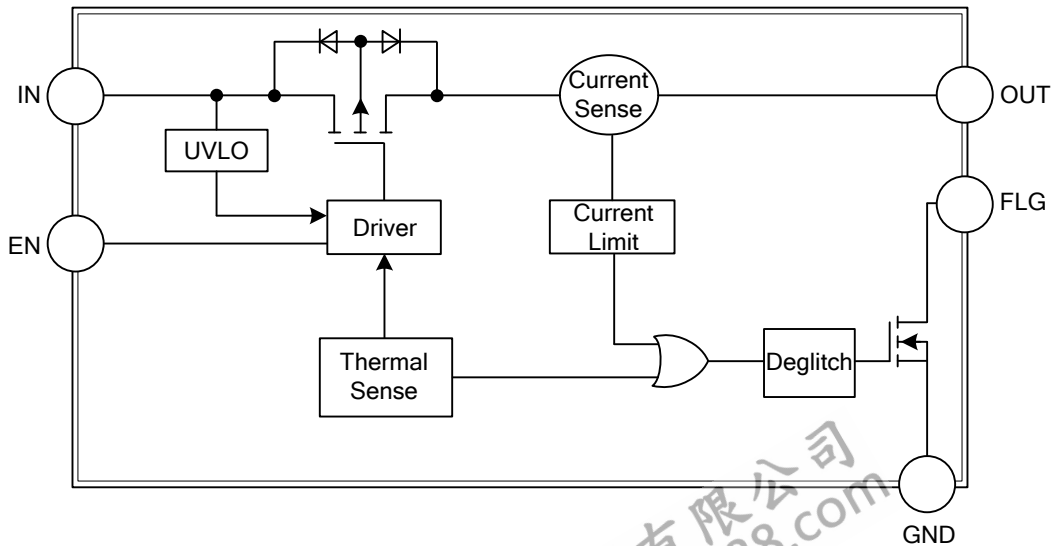
PIN CONFIGURATION



PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	GND	Ground
2, 3	IN	Voltage Input Pin (all IN pins must be tied together externally).
4	EN	Enable Input. Active Low or Active High.
5	FLG	Over-Current and Over-Temperature Fault Report. Open-Drain Flag is Active Low When Triggered
6, 7	OUT	Voltage Output Pin (all OUT pins must be tied together externally).
8	NC	No internal connection; recommend tie to OUT pins

BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=+25°C, unless otherwise specified.)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V <sub>IN</sub>	6.5	V
Output Voltage	V <sub>OUT</sub>	V <sub>IN</sub> +0.3	V
Enable Voltage	V <sub>EN</sub> , V <sub>FLG</sub>	6.5	V
Maximum Continuous Load Current	I <sub>LOAD</sub>	Internal Limited	A
Maximum Junction Temperature	T <sub>J(MAX)</sub>	150	°C
Storage Temperature Range (Note 1)	T <sub>ST</sub>	-65~+150	°C

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.  
2. UL Recognized Rating from -30°C to +70°C (Diodes qualified T<sub>ST</sub> from -65°C to +150°C).

■ RECOMMENDED OPERATING CONDITIONS (T<sub>A</sub>=+25°C, unless otherwise specified.)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V <sub>IN</sub>	2.7~5.5	V
Output Current	I <sub>OUT</sub>	0~500	mA
Operating Ambient Temperature	T <sub>A</sub>	-40~+85	°C
EN Input Logic Low Voltage	V <sub>IL</sub>	0~0.8	V
EN Input Logic High Voltage	V <sub>IH</sub>	2~V <sub>IN</sub>	V

■ THERMAL CHARACTERISTICS

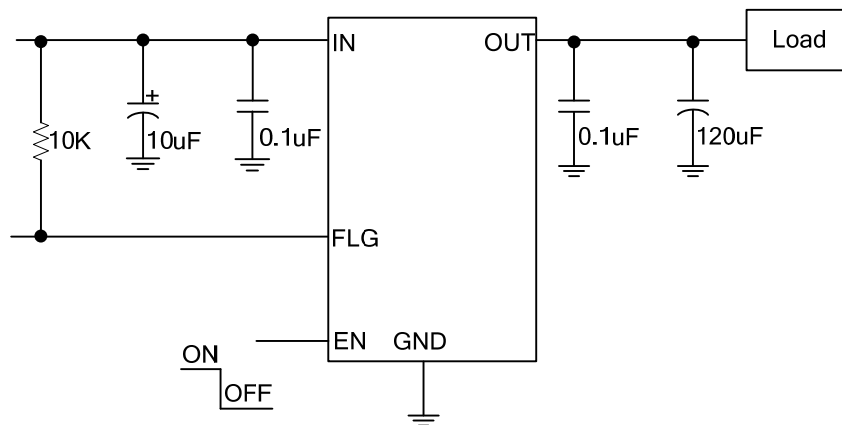
PARAMETER	SYMBOL	RATINGS	UNIT
Junction To Ambient	θ <sub>JA</sub>	110	°C/W

Note: Device mounted on FR-4, 2oz copper, with minimum recommended pad layout.

■ ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=+25°C, V<sub>IN</sub>=+5.0V, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input UVLO	V <sub>UVLO</sub>	R <sub>LOAD</sub> =1kΩ	1.6	1.9	2.5	V
Input Shutdown Current	I <sub>SHDN</sub>	Disabled, I <sub>OUT</sub> =0		0.5	1	μA
Input Quiescent Current	I <sub>Q</sub>	Enabled, I <sub>OUT</sub> =0		45	70	μA
Input Leakage Current	I <sub>LEAK</sub>	Disabled, OUT grounded			1	μA
Reverse Leakage Current	I <sub>REV</sub>	Disabled, V <sub>IN</sub> =0V, V <sub>OUT</sub> =5V, I <sub>REV</sub> at V <sub>IN</sub>		1		μA
Switch On-Resistance (T <sub>A</sub> =25°C)	R <sub>DS(ON)</sub>	V <sub>IN</sub> =5V, I <sub>OUT</sub> =0.5A		110	140	mΩ
		V <sub>IN</sub> =3.3V, I <sub>OUT</sub> =0.5A		125	160	
Short-Circuit Current Limit	I <sub>SHORT</sub>	Enabled into short circuit, C <sub>L</sub> =22μF		0.6		A
Over-Load Current Limit	I <sub>LIMIT</sub>	V <sub>IN</sub> =5V, V <sub>OUT</sub> =4.8V, C <sub>L</sub> =22μF	0.6	0.8	1.0	A
Current Limiting Trigger Threshold	I <sub>TRIG</sub>	Output Current Slew rate (<100A/s), C <sub>L</sub> =22μF		1.0		A
EN Input Leakage	I <sub>SINK</sub>	V <sub>EN</sub> =5V			1	μA
Output Turn-On Delay Time	T <sub>D(ON)</sub>	C <sub>L</sub> =1μF, R <sub>LOAD</sub> =10Ω		0.05		ms
Output Turn-On Rise Time	T <sub>R</sub>	C <sub>L</sub> =1μF, R <sub>LOAD</sub> =10Ω		0.6	1.5	ms
Output Turn-Off delay Time	T <sub>D(OFF)</sub>	C <sub>L</sub> =1μF, R <sub>LOAD</sub> =10Ω		0.01		ms
Output Turn-Off Fall Time	T <sub>F</sub>	C <sub>L</sub> =1μF, R <sub>LOAD</sub> =10Ω		0.05	0.1	ms
FLG Output FET On-Resistance	R <sub>FLG</sub>	I <sub>FLG</sub> =10mA		20	50	Ω
FLG Blanking Time	T <sub>BLANK</sub>	C <sub>IN</sub> =10μF, C <sub>L</sub> =22μF	4	7	15	ms
Thermal Shutdown Threshold	T <sub>SHDN</sub>	Enabled, R <sub>LOAD</sub> =1kΩ		140		°C
Thermal Shutdown Hysteresis	T <sub>HYS</sub>			25		°C

■ TYPICAL APPLICATION CIRCUIT



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