



0.5A SINGLE CHANNEL CURRENT-LIMITED POWER SWITCH

■ 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.

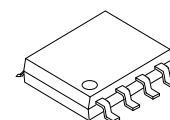
■ FEATURES

- * 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

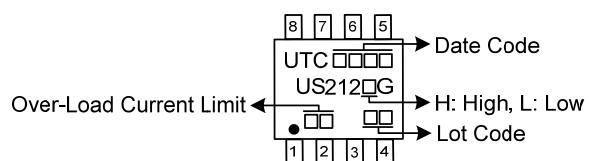
Ordering Number		Package	Packing
Lead Free	Halogen Free		
US212XL-xx-S08-R	US212XG-xx-S08-R	SOP-8	Tape Reel

US212XL-xx-S08-R		(1) Packing Type (2) Package Type (3) Over-Load Current Limit (4) Green Package (5) EN Input Logic Voltage
		(1) R: Tape Reel (2) S08: SOP-8 (3) 08: 0.8V (4) G: Halogen Free and Lead Free (5) H: Active High, L: Active Low

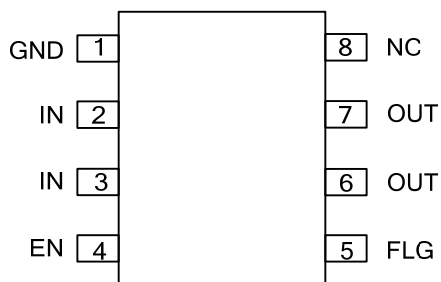


SOP-8

MARKING



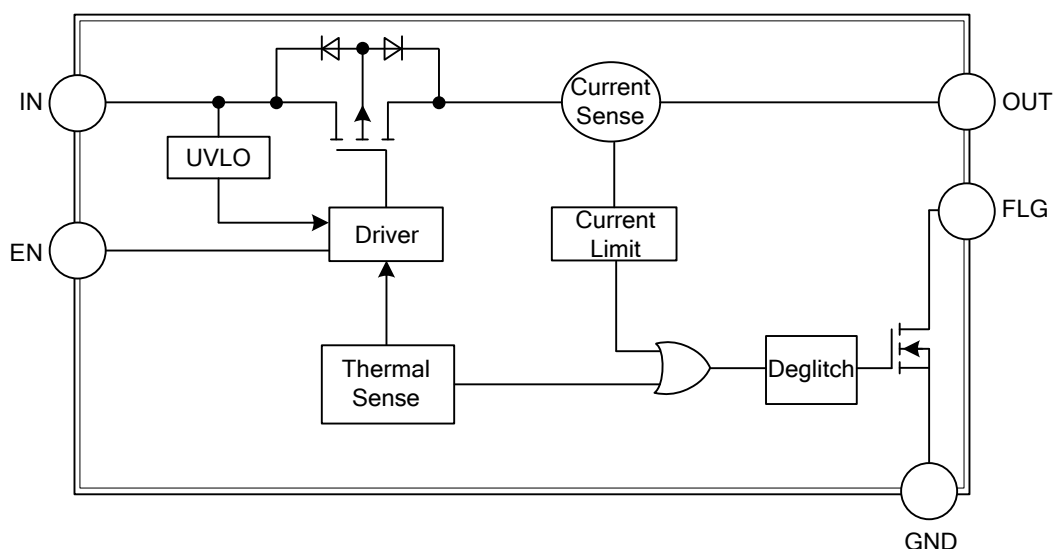
PIN CONFIGURATION



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 ($T_A=+25^{\circ}\text{C}$, unless otherwise specified.)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{IN}	6.5	V
Output Voltage	V_{OUT}	$V_{IN}+0.3$	V
Enable Voltage	V_{EN}, V_{FLG}	6.5	V
Maximum Continuous Load Current	I_{LOAD}	Internal Limited	A
Maximum Junction Temperature	$T_{J(MAX)}$	150	$^{\circ}\text{C}$
Storage Temperature Range (Note 1)	T_{ST}	-65~+150	$^{\circ}\text{C}$

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 $+70^{\circ}\text{C}$ (Diodes qualified T_{ST} from -65°C to $+150^{\circ}\text{C}$).

■ RECOMMENDED OPERATING CONDITIONS ($T_A=+25^{\circ}\text{C}$, unless otherwise specified.)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{IN}	2.7~5.5	V
Output Current	I_{OUT}	0~500	mA
Operating Ambient Temperature	T_A	-40~+85	$^{\circ}\text{C}$
EN Input Logic Low Voltage	V_{IL}	0~0.8	V
EN Input Logic High Voltage	V_{IH}	2~ V_{IN}	V

■ THERMAL CHARACTERISTICS

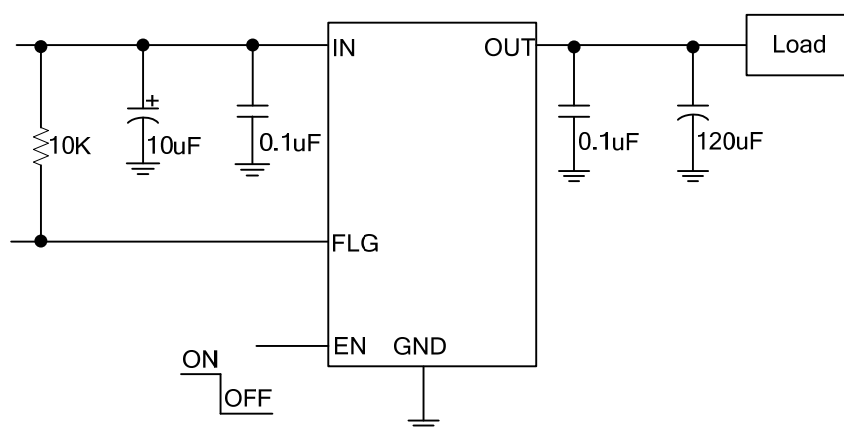
PARAMETER	SYMBOL	RATINGS	UNIT
Junction To Ambient	θ_{JA}	110	$^{\circ}\text{C/W}$

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

■ ELECTRICAL CHARACTERISTICS ($T_A=+25^{\circ}\text{C}$, $V_{IN}=+5.0\text{V}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input UVLO	V_{UVLO}	$R_{LOAD}=1\text{k}\Omega$	1.6	1.9	2.5	V
Input Shutdown Current	I_{SHDN}	Disabled, $I_{OUT}=0$		0.5	1	μA
Input Quiescent Current	I_Q	Enabled, $I_{OUT}=0$		45	70	μA
Input Leakage Current	I_{LEAK}	Disabled, OUT grounded			1	μA
Reverse Leakage Current	I_{REV}	Disabled, $V_{IN}=0\text{V}$, $V_{OUT}=5\text{V}$, I_{REV} at V_{IN}		1		μA
Switch On-Resistance ($T_A=25^{\circ}\text{C}$)	$R_{DS(ON)}$	$V_{IN}=5\text{V}$, $I_{OUT}=0.5\text{A}$		110	140	m Ω
		$V_{IN}=3.3\text{V}$, $I_{OUT}=0.5\text{A}$		125	160	
Short-Circuit Current Limit	I_{SHORT}	Enabled into short circuit, $C_L=22\mu\text{F}$		0.6		A
Over-Load Current Limit	I_{LIMIT}	$V_{IN}=5\text{V}$, $V_{OUT}=4.8\text{V}$, $C_L=22\mu\text{F}$	0.6	0.8	1.0	A
Current Limiting Trigger Threshold	I_{TRIG}	Output Current Slew rate ($<100\text{A/s}$), $C_L=22\mu\text{F}$		1.0		A
EN Input Leakage	I_{SINK}	$V_{EN}=5\text{V}$			1	μA
Output Turn-On Delay Time	$T_{D(ON)}$	$C_L=1\mu\text{F}$, $R_{LOAD}=10\Omega$		0.05		ms
Output Turn-On Rise Time	T_R	$C_L=1\mu\text{F}$, $R_{LOAD}=10\Omega$		0.6	1.5	ms
Output Turn-Off delay Time	$T_{D(OFF)}$	$C_L=1\mu\text{F}$, $R_{LOAD}=10\Omega$		0.01		ms
Output Turn-Off Fall Time	T_F	$C_L=1\mu\text{F}$, $R_{LOAD}=10\Omega$		0.05	0.1	ms
FLG Output FET On-Resistance	R_{FLG}	$I_{FLG}=10\text{mA}$		20	50	Ω
FLG Blanking Time	T_{BLANK}	$C_{IN}=10\mu\text{F}$, $C_L=22\mu\text{F}$	4	7	15	ms
Thermal Shutdown Threshold	T_{SHDN}	Enabled, $R_{LOAD}=1\text{k}\Omega$		140		$^{\circ}\text{C}$
Thermal Shutdown Hysteresis	T_{HYS}			25		$^{\circ}\text{C}$

■ TYPICAL APPLICATION CIRCUIT



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