

UNISONIC TECHNOLOGIES CO., LTD

US2005

Preliminary

CMOS IC

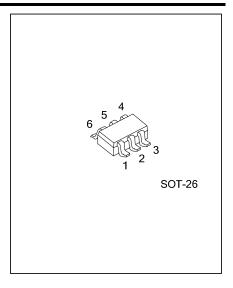
FIXED CURRENT LIMIT POWER DISTRIBUTION SWITCH

DESCRIPTION

UTC US2005 is a low voltage cost-effective high-side power switch with current limiting function. It is particularly suitable for general purpose power distribution and control in digital televisions (DTV), printers, set top boxes (STB), PCs, PDAs, and other peripheral devices.

UTC US2005 contains a charge pump circuitry to drive the internal MOSFET switch and also incorporate such protection circuits: soft-start circuit protect these devices from being damaged by limiting inrush current during plug-in; thermal shutdown circuit is used to prevent catastrophic switch failure from high-current loads. UVLO is used to ensure that the device remains off unless there is a valid input voltage present. A flag output is designed to indicate fault conditions to the local USB controller. Lower quiescent current as 80µA making this device ideal for portable battery-operated equipment.

UTC US2005 allows momentary high current surges to pass unrestricted without sacrificing overall system safety. It also allows output slew rate limiting by an external capacitor.



FEATURES

- * Built-in 80mΩ N-MOSFET
- * Open-drain fault flag output to Indicate fault conditions
- * Input voltage varies from 2.5V to 5.5V
- * 80µA low quiescent current
- * Current limit values of 0.5A, 0.8A, and 1.2A
- * Automatic-on output after fault
- * Thermal protection
- * Under voltage lock-out (UVLO)

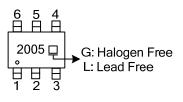
ORDERING INFORMATION

Lead Free Halogen Free Package	Packing					
Lead free fraiogen free)					
US2005L-AG6-R US2005G-AG6-R SOT-26	Tape Reel					
Note: xx: Output Voltage, refer to Marking Information.						

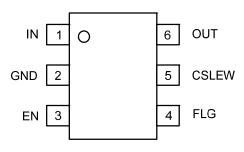
US2005L-xx-AG6-R						
│	(1) R: Tape Reel					
(2)Package Type	(2) AG6: SOT-26					
(3)Output Voltage Code	(3) xx: Refer to Marking Information					
(4)Halogen Free	(4) L: Lead Free, G: Halogen Free					
MARKING INFORMATION						
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MARKING INFORMATION

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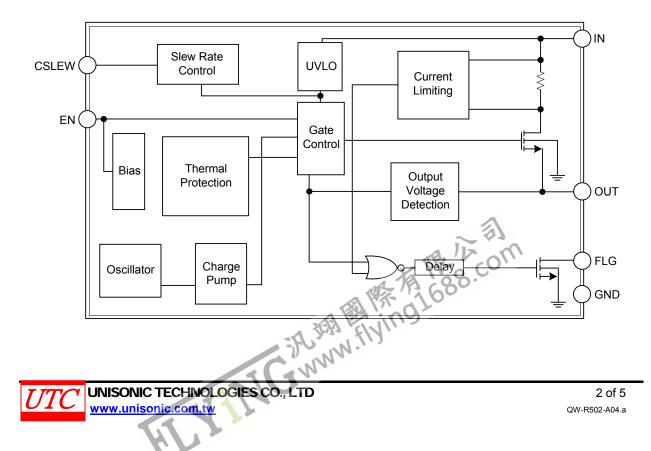
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	IN	Supply input. This pin provides power to both the output switch and the UTC US2005's internal control circuitry.
2	GND	Ground.
3	EN	Switch Enable (Input): Active-high (-1) or active-low (-2)
4	FLG	Fault status. A logic LOW on this pin indicates the UTC US2005 is in current limiting, or has been shut down by the thermal protection circuit. This is an 'Open Drain' output allowing logical OR' ing of multiple UTC US2005s.
5	CSLEW	Slew rate control. Adding a small value capacitor between this pin and VIN slows turn-ON of the power FET.
6	OUT	Switch output. The load being driven by UTC US2005 is connected to this pin.

BLOCK DIAGRAM



US2005

ABSOLUTE MAXIMUM RATING (T_A=25°C, unless otherwise specified) (Note 1)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V _{IN}	6	V
Enable Input Voltage	V _{EN}	5.5	V
Flag Voltage	V _{FLG}	5.5	V
Power Dissipation (T _A =25°C)	PD	0.4	W
Junction Temperature	TJ	150	°C
Storage Temperature	T _{STG}	-65~150	°C

Note: 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.

THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Package Thermal Resistance	θ _{JA}	230	°C/W

RECOMMENDED OPERATING CONDITIONS (Note 2)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Input Voltage	V _{IN}	2.5~5.5	V
Enable Input Voltage	V _{I(EN)}	0~5.5	V
Continuous Output Current Range		0~2.1	А
Ambient Operating Temperature	T _A	-40~+85	°C

ELECTRICAL CHARACTERISTICS

(VIN=5V, TAMBIENT=25°C unless specified otherwise. Bold indicates -40°C~+85°C limits.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Switch Input Voltage	V _{IN}		2.5		5.5	V
Internal Supply Current	I _{IN}	Switch=OFF, ENABLE=0V		1	5	μA
Internal Supply Current	I _{IN}	Switch=ON, I _{OUT} =0, ENABLE=1.5V		80	300	μA
Output Leakage Current	I _{LEAK}	V _{IN} =5V, V _{OUT} =0V, ENABLE=0		12	100	μA
Power Switch Resistance	R _{DS(ON)}	V _{IN} =5V, I _{OUT} =100mA		70	100 125	mΩ mΩ
Current Limit: –0.5	I _{LIMIT}	V _{OUT} =0.8V _{IN} to V _{OUT} =1V	0.5	0.7	0.9	А
Current Limit: –0.8	ILIMIT	V _{OUT} =0.8V _{IN} to V _{OUT} =1V	0.8	1.1	1.5	А
Current Limit: –1.2	I _{LIMIT}	V _{OUT} =0.8V _{IN} to V _{OUT} =1V	1.2	1.6	2.1	А
Secondary Current Limit (Kickstart)	I _{LIMIT_2nd}	V _{IN} =2.7V	2.2	4	6	А
Under Voltage Lock Out		V _{IN} Rising	2.0	2.25	25	V
Threshold	UVLO _{THRESHOLD}	V _{IN} Falling	1.9	2.15	2.4	V
	V	V _{IL} (max.)			0.5	V
ENABLE Input Voltage	V _{EN}	V _{IH} (min)	1.5			V
ENABLE Input Current	I _{EN}	V _{EN} =0V~5.0V		1	5	μA
Fault Status Output Voltage	V _{FAULT}	I _{OL} =10mA		0.25	0.4	V
Over-Temperature Threshold		T _J Increasing		145		°C
	OTTHRESHOLD	TJDecreasing	~	135		0
Over-Temperature Threshold OT _{THRESHOLD} Istriceasing 145 °C T_J Decreasing 135 °C UNISONIC TECHNOLOGIES CO., LTD 3 of 5 www.unisonic.com.tw W-R502-A04.a						
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AC CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Turn-ON Rise Time	t _{RISE}	R _L =10Ω, C _{LOAD} =1μF, V _{OUT} =10%~90%	500	1000	1500	μs
Delay Before Asserting Or Releasing FLG	t _{D_FAULT}	Time from Current Limiting to FLG State Change. UTC US2005	20	32	49	ms
Output Turn-ON Delay	ton dly	R _L =43Ω, C _L =120μF, V _{EN} =50%~V _{OUT} =90%		1000	1500	μs
Output Turn-OFF Delay	t _{OFF DLY}	R _L =43Ω, C _L =120μF, V _{EN} =50%~V _{OUT} =90%			700	μs

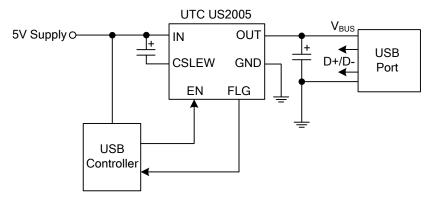
Notes: 1. Exceeding the absolute maximum rating may damage the device.

2. The device is not guaranteed to function outside its operating rating.



US2005

TYPICAL APPLICATION CIRCUIT



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