Ordering number : EN*A1404

Preliminary

SANYO Semiconductors
DATA SHEET

STK628-130-E — Thick-Film Hybrid IC Inverter for IH Cooker Inverter Hybrid IC

Overview

The STK628-130-E is a inverter power hybrid IC for IH cooker containing power devices (IGBT and FRD), pre-driver, and temperature monitor.

Applications

- Inverter for IH cooker.

Features

- Built in integrates power devices (IGBT and FRD), pre-driver circuit.
- Built in thermal protection.
- The temperature monitor is enabled through the use of an internal thermistor.
- A single power supply drive is enabled with using of internal bootstrap circuits for upper power supplies.
- Direct input of control signal is possible.
- SIP (the single in-line package).

Specifications

Absolute maximum ratings at Tc = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V_{CC}		400	V
Collector-emitter voltage	V_{CE}	+ - -	600	V
Output current	I_O	+, -, OUT terminal current	±60	A
Output peak current	Iop	+, -, OUT terminal current PW=100μs, 1pulse	±90	A
Pre-driver supply voltage	V_L	V_L - V_{SS}	0 to 18	V
	V_{DD}	V_{DD} - V_{SS}	0 to 18	V
Input signal voltage	V_{IN}	HIN, LIN ,SD terminal	-0.3 to V_{DD}+0.3	V
Maximum loss	Pd	IGBT, Per 1 pcs	135	W
Junction-to-substrate thermal resistance	θj-c(T)	IGBT, Per 1 pcs	0.9	°C/W
	θj-c(D)	DIODE, Per 1 pcs	1.9	
Junction temperature	Tj	IGBT, FRD junction temperature	150	°C
Storage temperature	Tstg		-40 to +125	°C
Operating temperature	TC	H-IC case temperature	-20 to +100	°C
Tightening torque	MT	A screw part *1	1.0	N•m

In the case without the instruction, the voltage standard is V_{SS} terminal voltage.

*1 Flatness of the heat-sink should be lower than 0.25mm.

Electrical Characteristics at Tc=25°C, V_L, V_{DD}=15V

Parameters	Symbols	Conditions	min	typ	max	unit
Power output part						
Collector-to-emitter cut-off current	I_{CE}	V_{CE}=600V			150	μA
Collector-to-emitter saturation voltage	V_{CE} (sat)	I_O=60A, Ch+, Ch-		1.8	2.5	V
Diode forward voltage	V_F	I_O=-40A, Ch+, Ch-		1.6	2.2	V
Control (Pre-driver) part						
Pre-drive power supply consumption electric current	I_D	V_L, V_{DD}=15V		0.7	2.0	mA
Input ON voltage	V_{IH}	Output ON	9.5			V
Input OFF voltage	V_{IL}	Output OFF			6.0	V
Excessive temperature	TSD	The substrate surface		110		°C
Temperature mounting resistance	Rt	TH-V_{SS} value	90	100	110	kΩ
Monitor resistor B-constant	B	25/50 °C		4250		k
Switching time	ton	I_O=50A, Inductive load		0.7		μs
	toff			0.7		

In the case without the instruction, the voltage standard is V_{SS} terminal voltage.

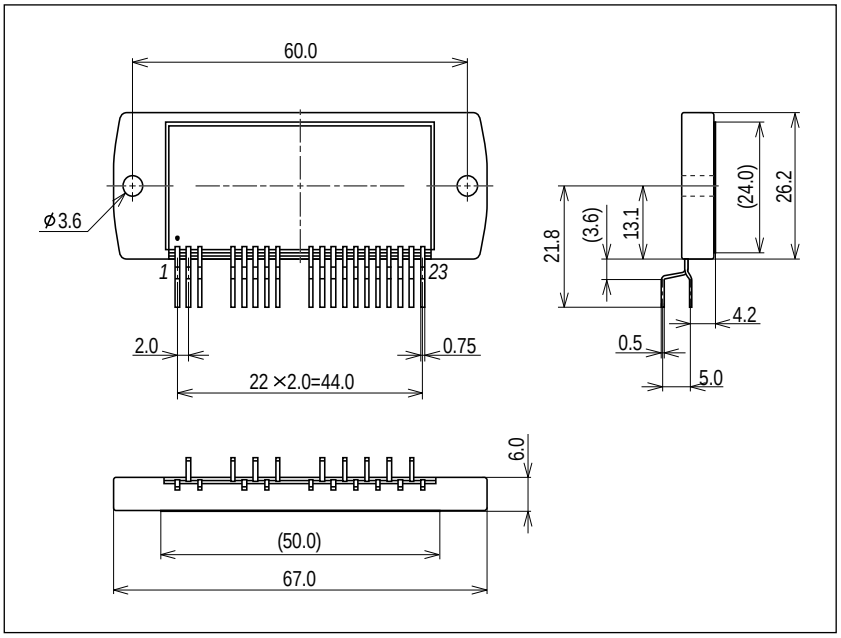
Notes

1. Input ON voltage indicates a value to turn on output stage IGBT.
   Input OFF voltage indicates a value to turn off output stage IGBT.
   At the time of output ON, set the input signal voltage V_{IH} (min.) to V_{DD} (max.).
   At the time of output OFF, set the input signal voltage 0V to V_{IL} (Max.).

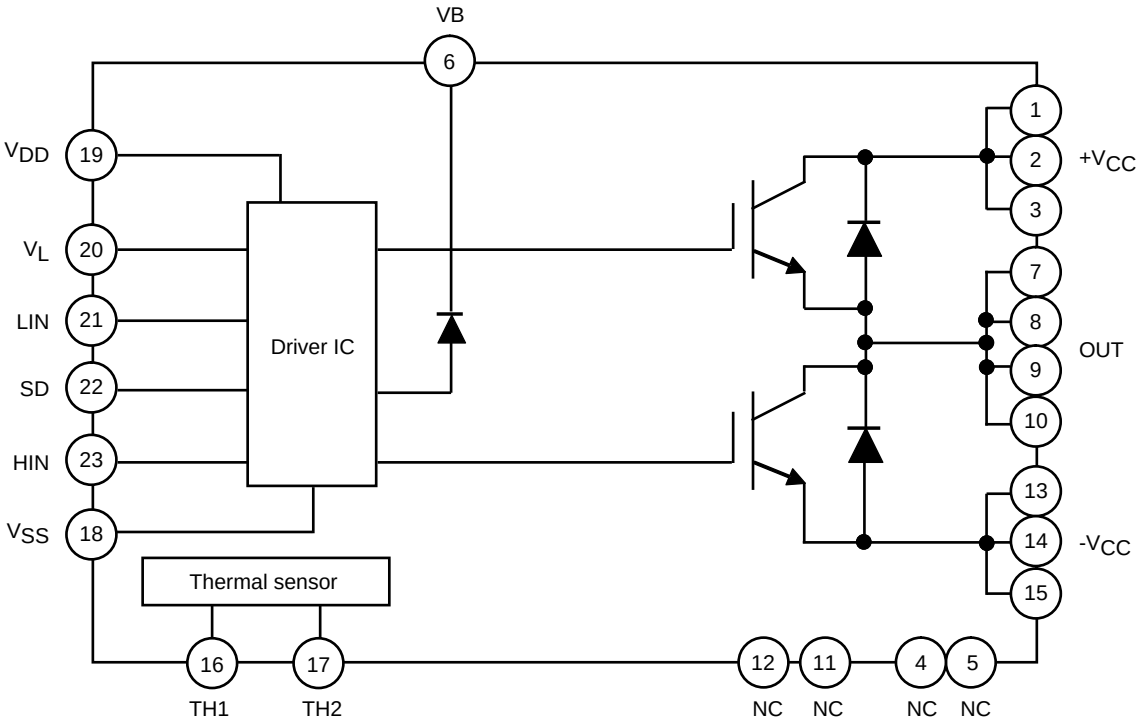
2. When assembling the hybrid IC on the heat sink, tightening torque range is 0.8N•m to 1.0N•m.
   Flatness of the heat-sink should be lower than 0.25mm.

Package Dimensions

unit:mm (typ)



Internal Block Diagram



Test Circuit

+shows the upper side and - shows the lower side.

Fig.1 ICEO (IGBT/FRD)

ICEO (IGBT/FRD)

	CH+	CH-
M	1	9
N	7	14

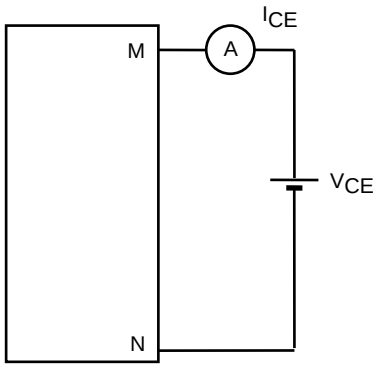


Fig.2 V_{CE}(sat) (Test by the pulse)

	CH+	CH-
M	1, 2, 3	7, 8, 9, 10
N	7, 8, 9, 10	13, 14, 15
m	23	21

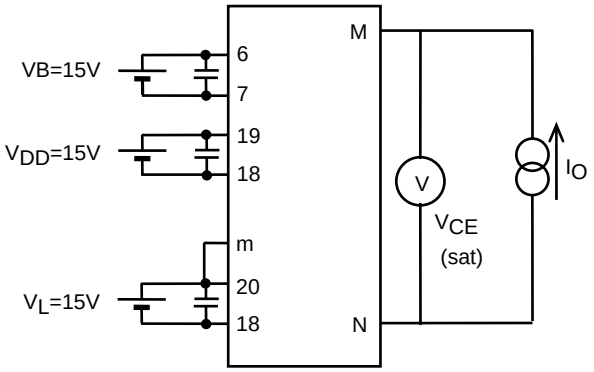


Fig.3 V_F (Test by the pulse)

	CH+	CH-
M	1, 2, 3	7, 8, 9, 10
N	7, 8, 9, 10	13, 14, 15

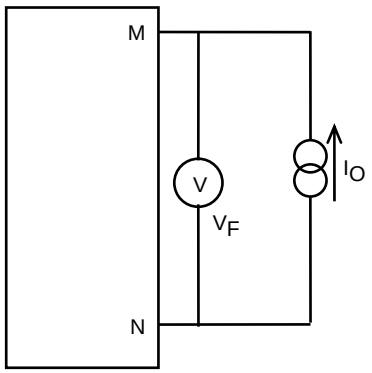
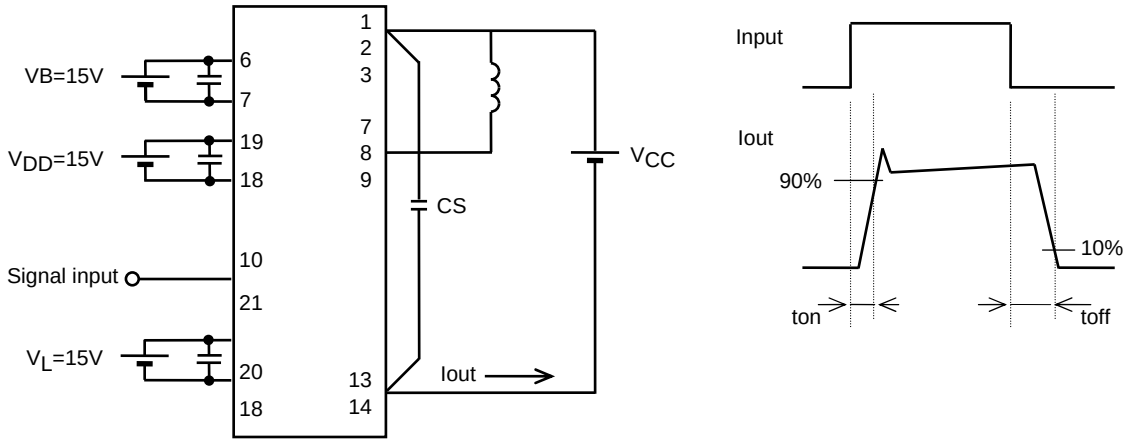
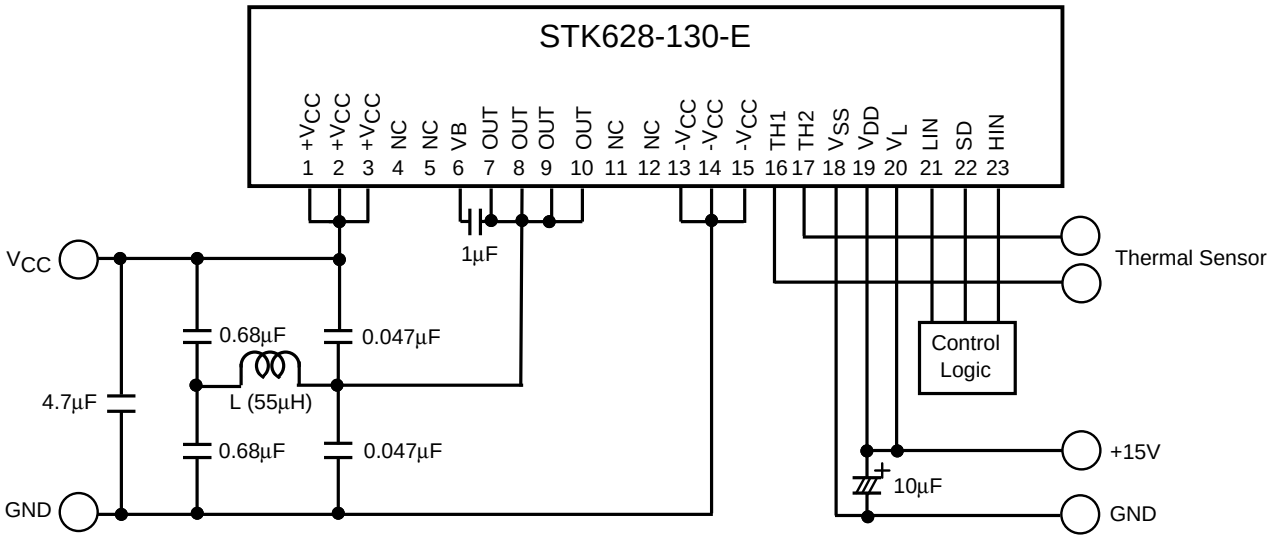


Fig.4 Switching time (example: ch1-)



Example of The Application Circuit



Recommended Operating Conditions

Parameters	Symbol	Conditions	min	typ	max	unit
Supply voltage	V_{CC}	$+V_{CC}$ - $-V_{CC}$		283	330	V
Pre-driver supply voltage	V_{DD}	V_{DD} - V_{SS} *1	13	15	18	V
Input ON voltage	V_{IN} (ON)	HIN, LIN, SD - V_{SS} terminal	11	13	18	V
Input OFF voltage	V_{IN} (OFF)				5	
PWM frequency	fPWM			20	60	kHz
Tightening torque	MT	'M3' Type Screw	0.8		1.0	N•m

Usage Precautions

1. This IC has a built-in thermistor between the TH terminal 1 (16pin) and TH terminal 2 (17pin).
   It allows monitoring of the board temperature using the divided voltage developed with the pull-up resistance RP.
   The resistance of the RP must be 10kΩ or higher at a pull-up voltage of 5V and 39kΩ or higher at a pull-up voltage of 15V.