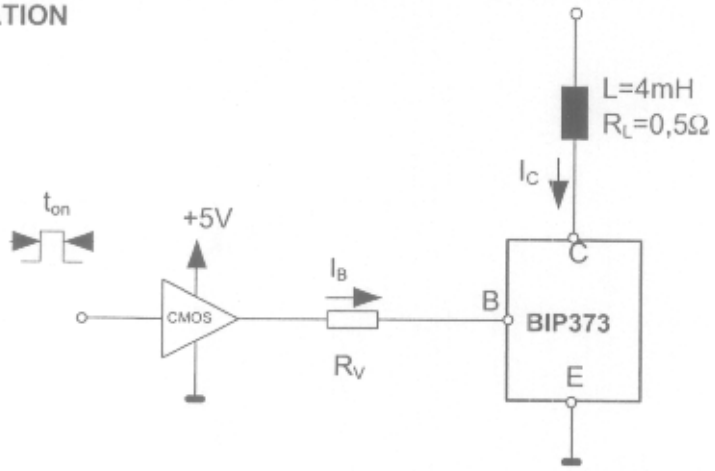
DESCRIPTION

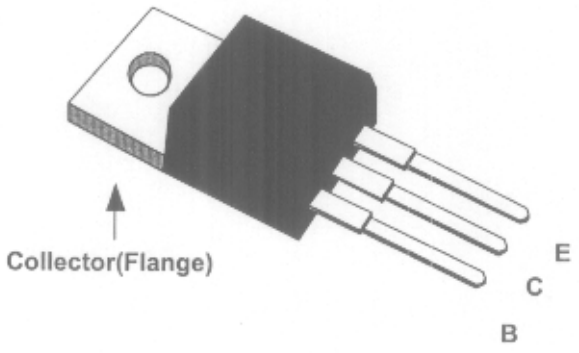
The bipolar triple-stage darlington BIP373 - especially developed to drive an ignition coil in automotive ignition circuits - can be controlled by standard CMOS logic. The rugged bipolar process assures safe operation in automotive-specific environment even under harsh conditions. The excellent quality of the concept - chip design and plastic packaging - has been proven in the field a million times. Due to the ESD performance - typical for HV-bipolar devices - special precautions during manufacturing or operation are not necessary.

The BIP373 has an active voltage clamp between collector and emitter. It is temperature compensated with an accuracy of about ±25 V in the entire temperature range. In order to protect the ECU, the wire harness, the coil and the ignition driver the collector current is limited at typ. 12 A for long dwell times. Using a virtual sense concept, a low saturation voltage of less than 2 V at 7 A in the entire temperature range has been obtained.
In order to prevent overheating and thermal damage of the device in case of excessive long dwell times the power stage is levelled down internally to a low current by the integrated „Overtemperature Protection" circuit (OTP) if the critical junction temperature is reached. This smooth process avoids spark ignition and prevents the device from being heated up further.
The BIP373 with all the built-in protection circuits is suitable for high performance and high operation temperature automotive igniton applications.

APPLICATION



Pin Configuration



ELECTRICAL CHARACTERISTICS

Unless otherwise specified:
V_{Bat}=6V...16V, I_B=5mA...12mA, $T_{Junction}$=-40°C...+150°C

Symbol	Parameter	Test Conditions, Comment	Min.	Typ.	Max.	Unit
V_{Cl}	Collector Emitter Clamping Voltage	at I_C=6A....7.3A measured 25µs after VCE=200V	350	375	400	V
V_{Cl_Peak}	Collector Emitter Clamping Voltage Peak	at I_C=6A....7.3A			450	V
I_{C_L}	Collector Current Limitation	V_{CE}=6V...10V; -40°C = T_j =125°C	9.0		16.0	A
		V_{CE}=6V...10V	8.5	11,5	16.0	A
		V_{CE}=4V	8.0		16.0	A
I_{off}	Off-state Current	V_{BE}=0; V_{CE}=250V			15	mA
I_{offa}	Off-state Current by active Input	V_{BE} = 0.8V; V_{CE} = 20V			25	mA
		I_B = 10uA; V_{CE} = 20V			25	mA
V_{CE_REV}	Reverse Polarity Collector Emitter Voltage	I_C=-5A	-1.3	-1.1		V
V_{BE_REV}	Reverse Polarity Base Emitter Voltage	I_C=-5A	-1.2			V
V_{CE_SAT}	Collector Emitter Saturation Voltage	I_C = 7A	1.4		2.0	V
		I_C = 8A			2.3	V
V_{BE_SAT}	Base Emitter Saturation Voltage	I_C = 7A, I_B = 5mA	2.55		3.85	V
		I_C = 7A, I_B = 12mA	3.20		4.85	V
t_{OFF}	Switching Time	I_C = 7A			40	µs
T_{OTP}	Thermally Controlled Shut-Down Temperature	at T_{Th_Sd} = T_j	185	195	210	°C
V_{CE_Re}	Threshold Voltage after Restart-Blockade	V_{BE}<5.5V, if V_{CE} <V_{CE_Re} , the Restart-Blockade is cancelled	30		60	V
V_{BE_bl}	Blockade of Device, Threshold Voltage		6,5	9,0	10,5	V
R_{thj_case}	Thermal Resistance				1.3	K/W

MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Collector Emitter Breakdown Voltage at 20mA (limited internally)	V_{CE}	250	V
Collector Base Breakdown Voltage	V_{CB}	250	V
Collector Current (limited internally)	I_{C_L}	16	A
Reverse Diode Forward Current	I_{EC}	10	A
Input Voltage T_{case} < 40°C, t < 60s	V_{BE}	14	V
Input Current	I_B	200	mA
Inductive Load Switching Avalanche Energy (L=4 mH)	E_L	450	mJ
Operating and Storage Junction Temperature Range	T_j	-40...150	°C

A 221 630 049-116

Specification and Handling as part
TKU: Y 221 K60 049-116
Handling Instructions: Y 221 K15 073e

Befestigungsschraube: M6
Festigkeit: 8.8
Anzugsmoment: 7 ± 1.4Nm

FIXING SCREW: M6
SCREW STRENGTH: 8.8
TIGHTENING TORQUE: 7 ± 1.4NM

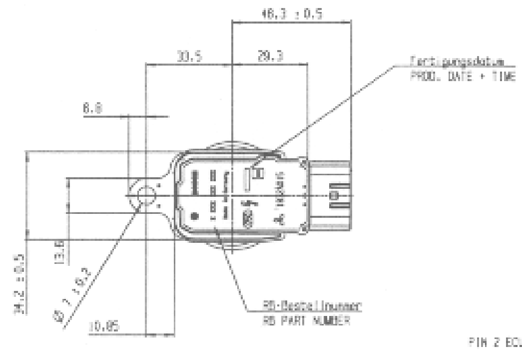
Kerzenstecker nicht demontieren !
DO NOT DISASSEMBLE SPARK PLUG CONNECTOR

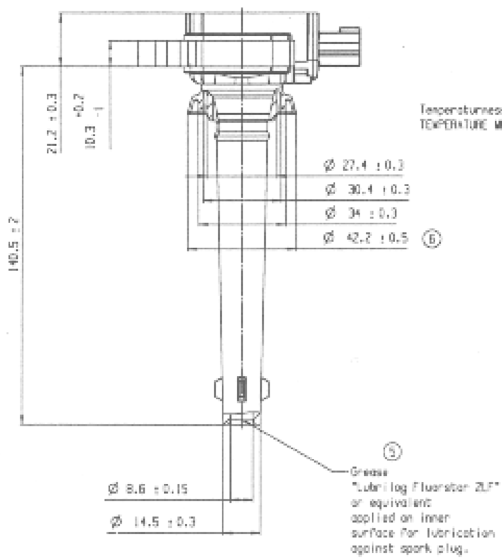
Steckverbindung in Kundenverantwortun

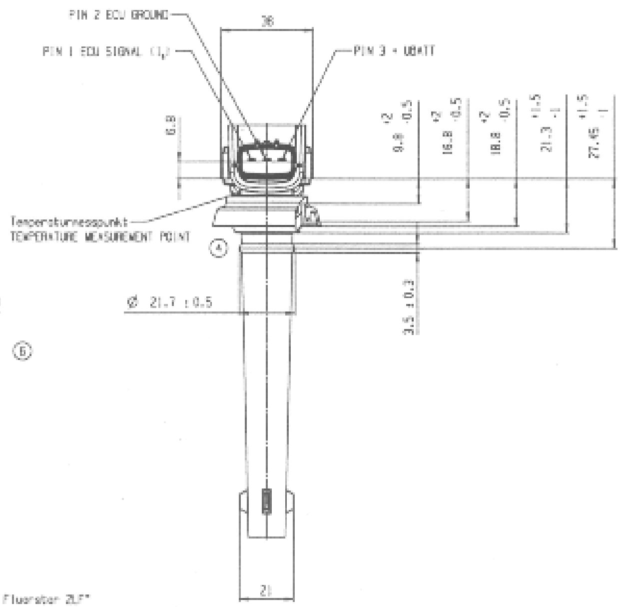
WIRE HARNESS CONNECTOR:

Name	Sumitomo Part No.
Housing assembly	6189-0779
Retainer	6918-1595
Terminal	8100-3808
Wire seal	7165-0472

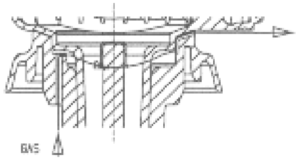
CUSTOMER HAS TO ASSURE THE CONTINUOUS STABILITY
OF THE CONNECTION SYSTEM.
BOSCH DOES NOT ACCEPT LIABILITY FOR DEFECTS
OF THE CONNECTION SYSTEM



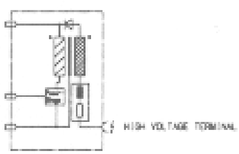




Entlueftungsprinzip
VENTILATION PRINCIPLE



CIRCUIT DIAGRAM:



Achtung:
Primaeranschluss fuehrt gefaehrliche Spannung!

CAUTION:
PRIMARY CONNECTION HAS DANGEROUS VOLTAGE !

CONNECTOR PIN DESIGNATION

TERMINAL	FUNCTION	TERMINAL PLATING
1	ECU CONTROL SIGNAL	TIN 1..4µm
2	ECU GROUND	TIN 1..4µm
3	+UBATT	TIN 1..4µm

Material Specification
ES-X56901
Controlled Substances for Use

No.	Change	Date
8	Order Number changed	22.03.2005
7	Changed	30.11.2004
6	Part No. corrected	24.11.2004
5	Changed	15.08.2004
4	New Rubber boot	21.07.2004
3	Part Number	13.02.2004
2	Diameter	29.01.2004

Angebots-Zeichnung / OFFER DRAWING

Zuendspule
IGNITION COIL

BOSCH

A 221 630 049-116

0 221 630 046-35 | 0 221 604 017 | 0 221 604 016