

Smart Power Bridges

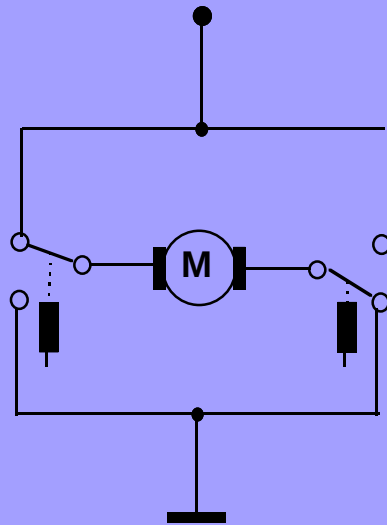


- ▲ DC Motor Drivers
- ▲ Stepper Motor Drivers
- ▲ TRILITHIC

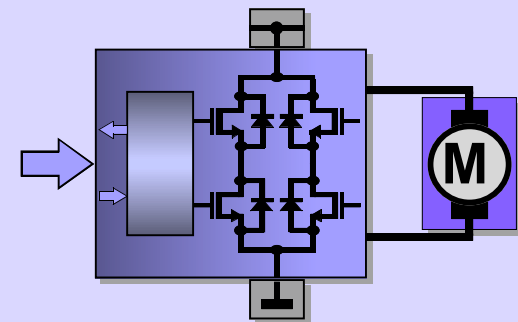
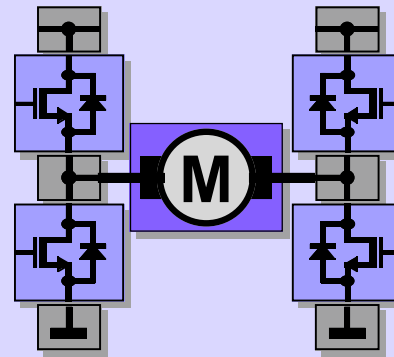


Power Motor Bridges

Principle

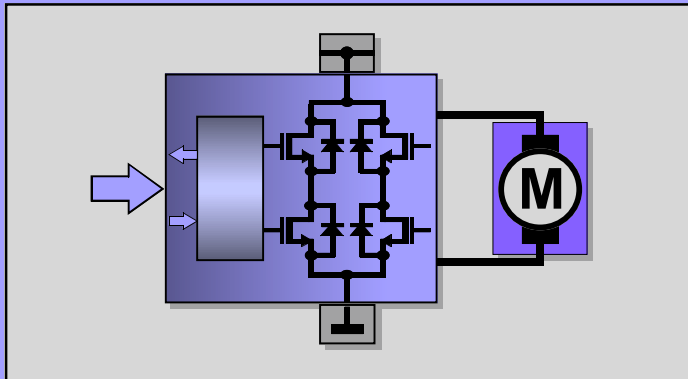


■ Yesterday: Relays



■ Today: Power Transistors and ICs

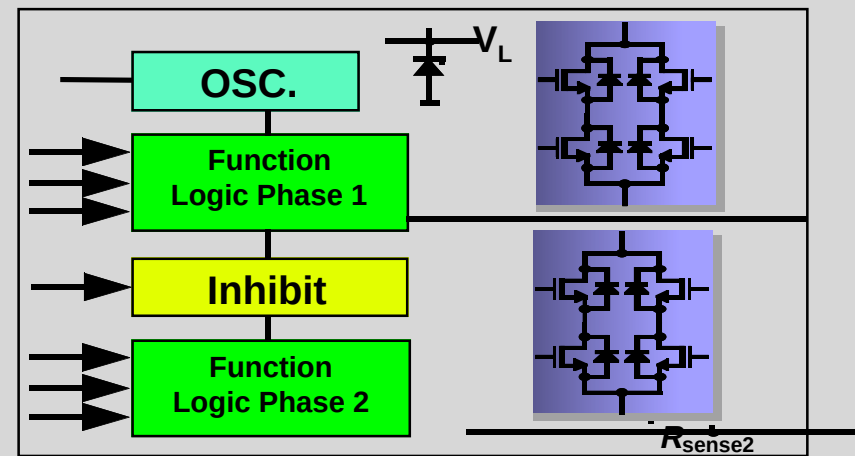
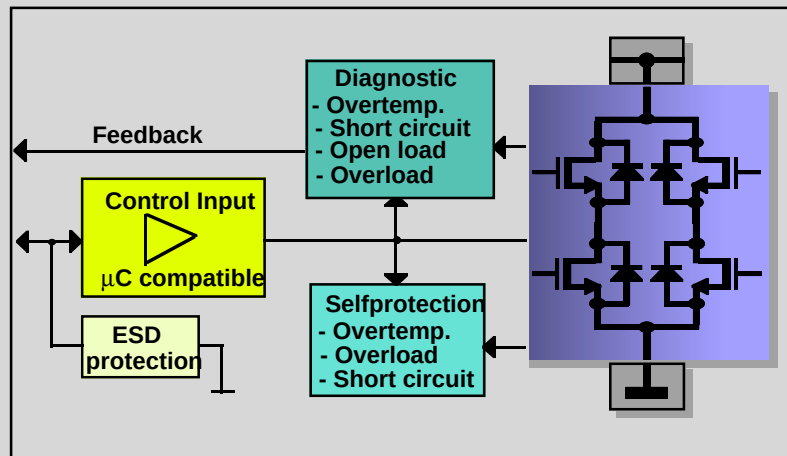
Smart Power Bridges



■ Main Advantages of Integrated DC- and Stepper Motor Drivers

- ▲ Replacements of relays
- ▲ Wide operating range up to 40 V
- ▲ Micro processor control
- ▲ Dynamic power control (PWM)
- ▲ Short circuit protection
- ▲ Cross current protection
- ▲ Over temperature protection
- ▲ Short and open circuit detection
- ▲ Diagnostic feedback
- ▲ Low standby current (Inhibit pin)
- ▲ Fast clamp diodes for motor recirculating current
- ▲ Low $R_{DS(on)}$ (TRILITHIC Power IC)

DC-Motor Bridges and Stepper Motor Drivers



- suitable for automotive and industrial applications
- highly precised diagnostic
- power functions with robust DMOS cells
- CMOS structures enable complex logic features.

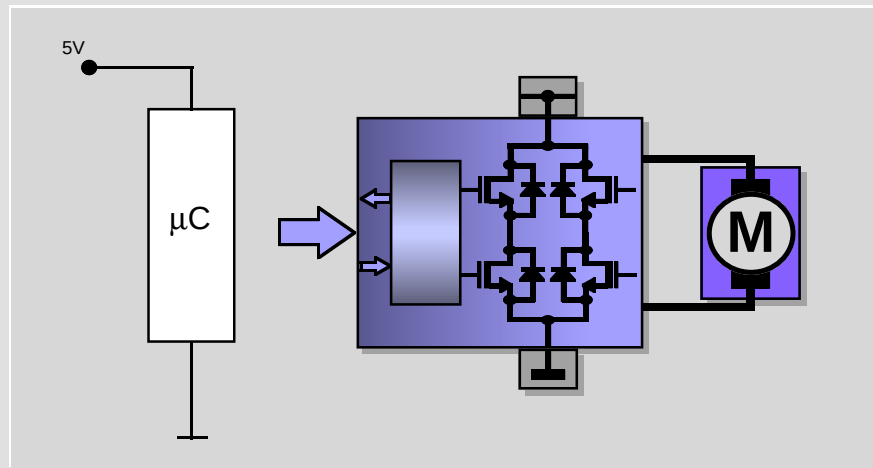


- perform exact diagnostics
- fully protected
- highly reliable and low cost system

Smart Power Bridges

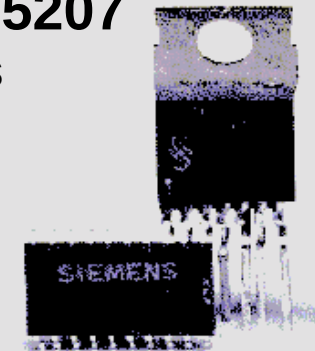
TLE 5203 / TLE 5204 / TLE 5205 / TLE 5206 / TLE 5207

Driving of a DC-Motor Bridge *without* external components



Features

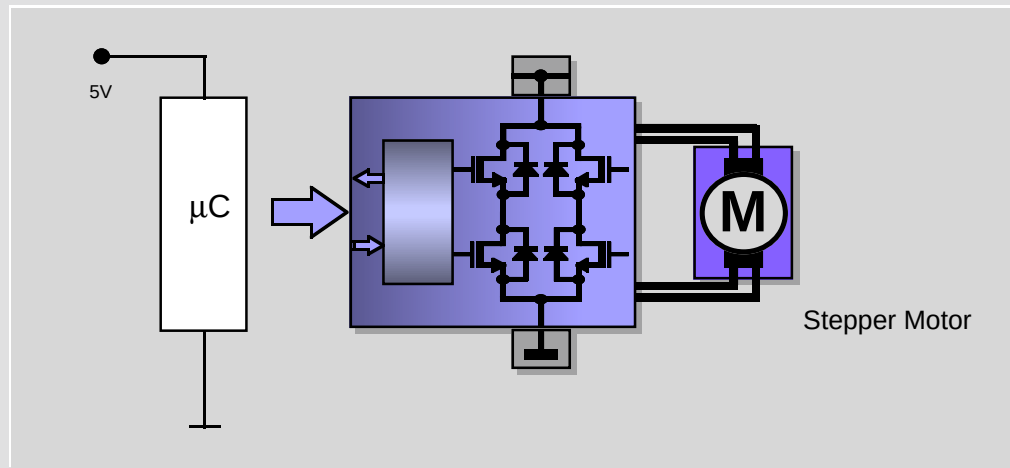
- Intelligent full bridge power IC
- 3A continuous current
- 6V to 40V operating range
- $300 \text{ m}\Omega$ R_{ON}
- Short and open circuit detection
- Inhibit (TLE 5207)



Smart Power Bridges

TLE 4726/27/28/29

The easy way to drive a two-phase stepper motor

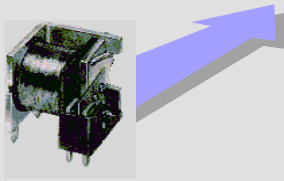


Features:

- 2x 0,7 amp. full bridge
- SMD package
- Integrated driver control
- Logic and current control (chopper)
- Error flag for overload, open load and overtemperature
- Short circuit protection
- Free wheeling diodes
- Inhibit (TLE 4729)

High Current Motor Bridge

TRILITHICTM



Silicon instead of heatsink

Survey

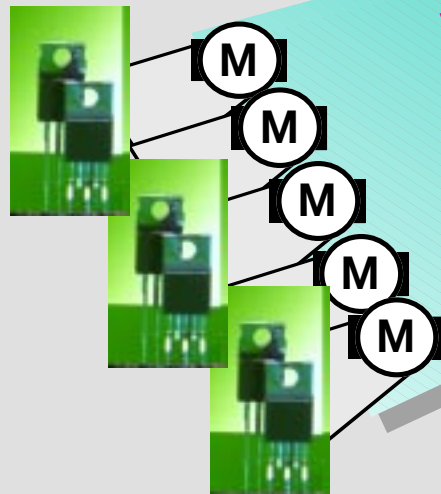
	U _{bb}	R _{on} (total)	I _L (SCr)	Status
BTS 770	40 V	220 mOhm 7 A	engineering samples	
BTS 771	40 V	125 mOhm 14A	engineering samples	
BTS 772	40 V	100 mOhm 20A	concept	

Main advantages

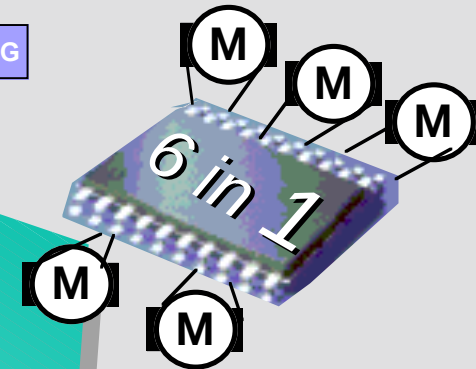
- Low R_{DSon}
- High current capability
- High flexibility
- Short circuit protection
- Charge pump
- Current limitation
- Thermal shutdown
- Diagnostic feedback
- Open load detection in on-state
- CMOS compatible input
- Under- and overvoltage shutdown with auto-restart and hysteresis

Smart Power Bridges

**New !!!
Product
Release**



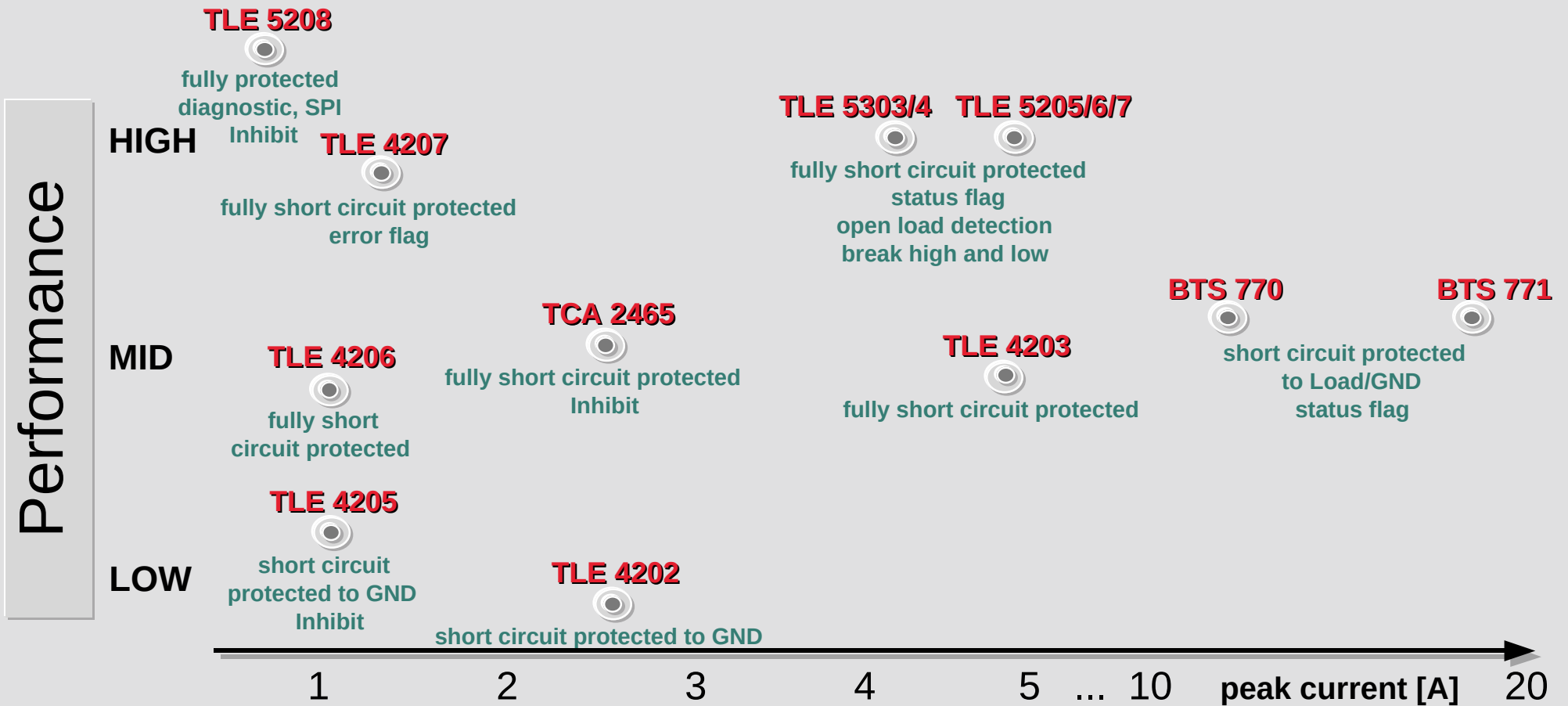
**Reduced Size
INNOVATION
Easy Mounting**



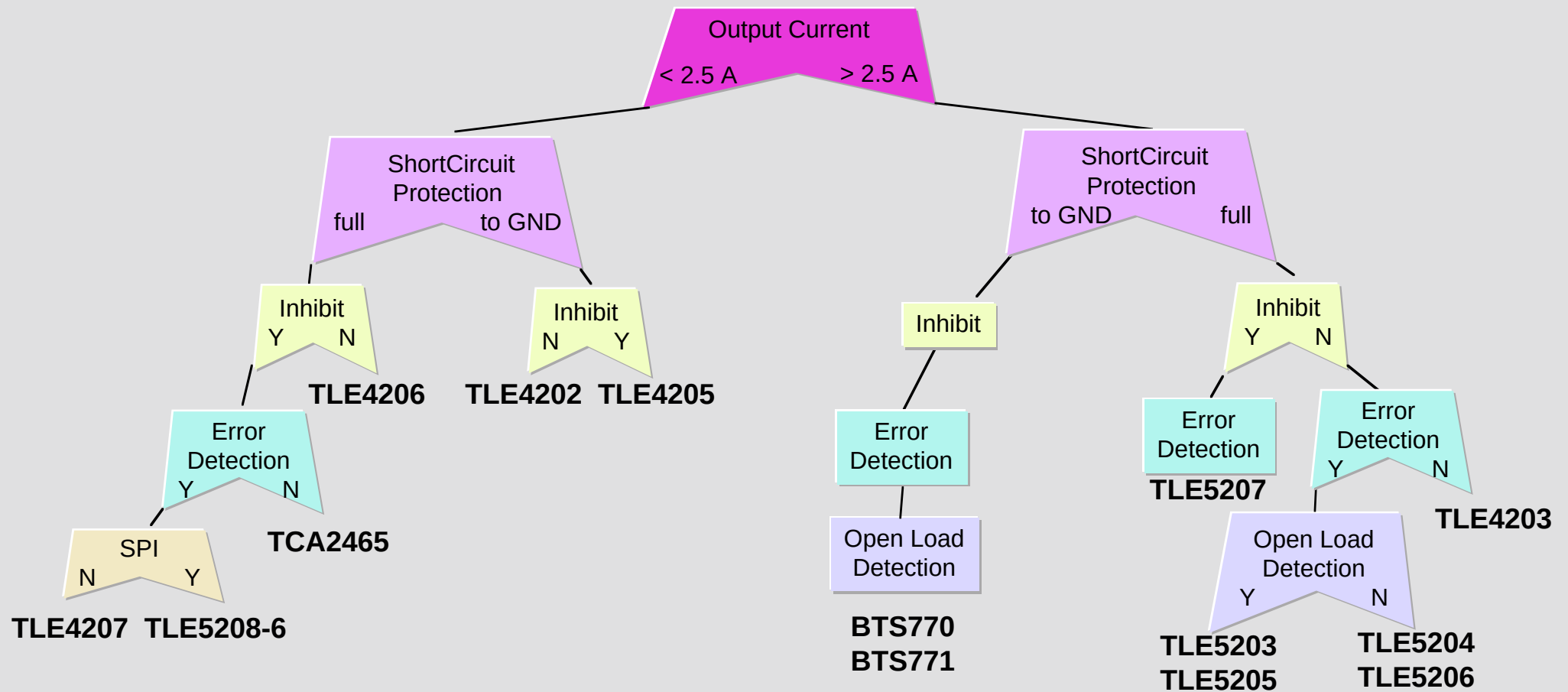
TLE 5208-6

**6-fold universal
Bridge driver**

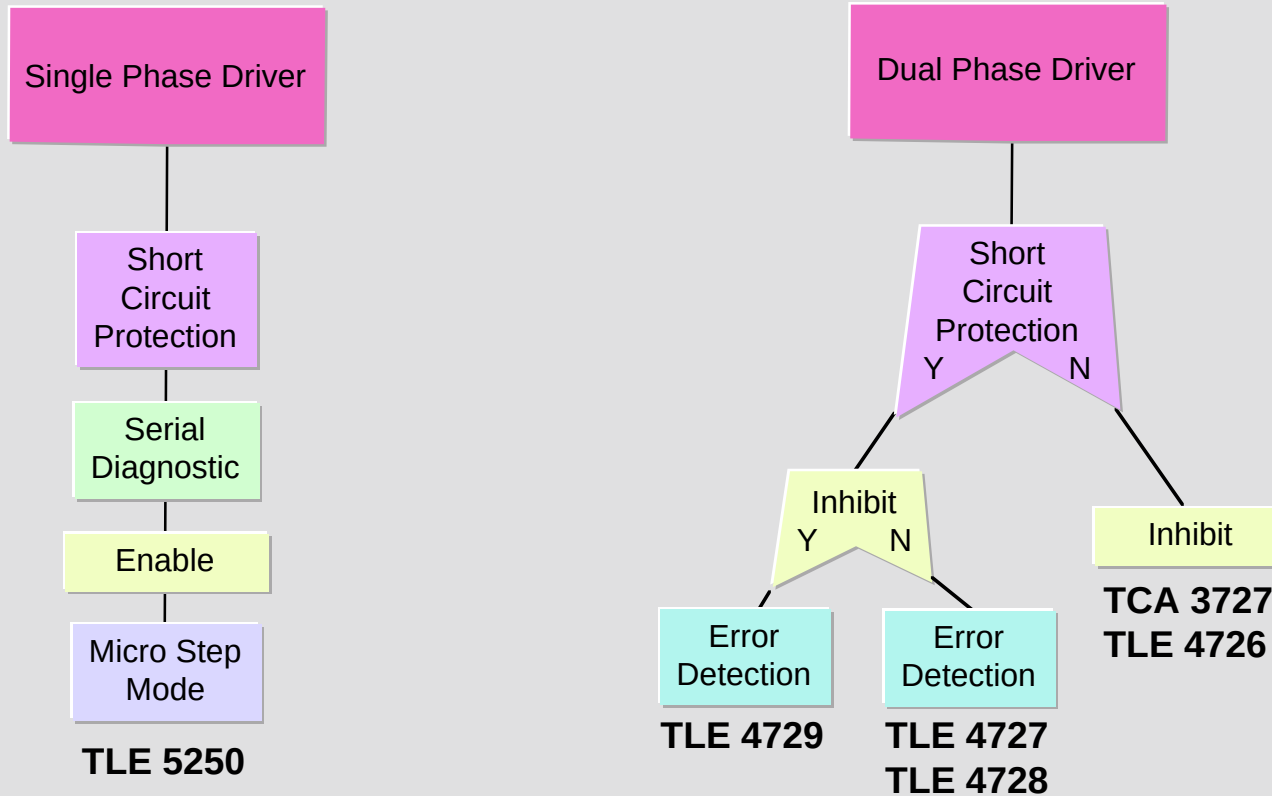
Overview Power Bridges



Selection Tree for DC Motor Drivers



Selection Tree for Stepper Motor Drivers



MOS Power Bridges

Feature	BTS 770	BTS 771
Output Current	3.0A	5.0A
Peak Current	12A	18A
Quiescent Current	15 μ A	15 μ A
Current Sense Out	no	no
Operating Range	6.0 - 34V	6.0 - 34V
Path R _{ON typ}	220 mOhm	125 mOhm
Path R _{ON max}	470 mOhm	300 mOhm
Switching Frequency f _{max}	HSS: 2kHz LSS: 100kHz	HSS: 2kHz LSS: 100kHz
Short Circuit Prot.	Load + GND	Load + GND
Self Protection	OT + OC	OT + OC
Diagnostic Interface	error flag	error flag
HIGHLIGHT	high peak cur. capability with high switching frequency	high peak cur. capability with high switching frequency
Package	P-DSO28	P-DSO28

Legend: HSS: High-Side-Switch; LSS: Low-Side-Switch; OT: Over Temperature Shutdown; OC: Over Current Protection

Power Semiconductors, Smart Power Bridges

Bipolar Power Bridges

NEW

NEW

Feature	TCA 2465	TLE 4202	TLE 4203	TLE 4205	TLE 4206	TLE 4207
Output Current	2.0A	2.0A	4.0A	0.8A	0.8A	0.8A
Peak Current	2.5A	2.5A	6.0A	1.0A	1.0A	1.5A
Quiescent Current	20μA	15mA	70mA	10μA	tbd	10μA
Operating Range	3.0 - 20V	3.5 - 17V	5 - 20V	6 - 32V	6 - 18V	6.0 - 20V
Short Circuit Protection	full protected	to GND	full protected	to GND	full protected	full protected
Inhibit	✓	no	no	✓	no	✓
HIGHLIGHT	dual operation amplifier	dual power compa-rator	dual high current compa-rator	dual power compa-rator	servo driver with peak current blanking	error detection + thermal optimized
Package	P-SIP9 P-DSO20	TO220-7-1	TO220-7-1	DIP-18 P-DSO20	P-DSO14	P-DSO14

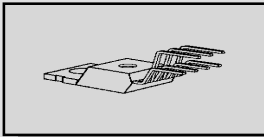
Mixed Technology Power Bridges

Feature	TLE 5203	TLE 5204	TLE 5205	TLE 5206	TLE 5207	TLE 5208
Output Current	3.0A	3.0A	4.0A	4.0A	4.0A	0.8A
Peak Current	4.0A	4.0A	5.0A	5.0A	6.0A	1.0A
Quiescent Current	10mA	10mA	10mA	10mA	10μA	20μA
Operating Range	6.0 - 40V	6.0 - 40V	6.0 - 40V	6.0 - 40V	6.0 - 40V	6.0 - 40V
Short Circuit Protection	full protected	full protected	full protected	full protected	full protected	full protected
Diagnostic Interface	status flag	status flag	status flag	status flag	status flag	16 bit SPI
HIGHLIGHT	open load detection	break high and low	open load detection	break high and low	low quiescent curr.	6-fold half bridge
Package	TO220-7-1 TO220-7-8	TO220-7-1 TO220-7-8	TO220-7-1 TO220-7-2 TO220-7-8 Power SO20	TO220-7-1 TO220-7-8 Power SO20	TO220-7-1 TO220-7-8	P-DSO28

Stepper Motor Driver

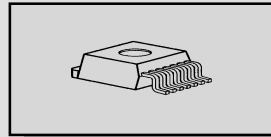
Feature	TCA 3727	TLE 4727	TLE 4728	TLE 4729	TLE 5250
Output Current	2x 0.75A	2x 0.75A	2x 0.75A	2x 0.75A	1x 2.5A
Peak Current	2x 1.0A	2x 1.0A	2x 1.0A	2x 1.0A	1x 3.0A
Step Operations	full to mini step	full to mini step	full to mini step	full to mini step	full to micro step fast nom/act comp.
Operating Range	5.0 - 50V	5.0 - 16V	5.0 - 16V	5.0 - 16V	6.0 - 40V
Short Circuit Protection	no	full protected	full protected	full protected	full protected
Diagnostic Interface	error flag	error flag	two bit error flag	error flag	serial diagnostic interface
HIGHLIGHT	lowest quiescent current	5V logic supply voltage	seperated error detection	low quiescent current	programmable output current from 10mA to 3A
Package	P-DIP20 P-DSO24	P-DIP20	P-DSO24	P-DSO24	P-SIP15 Power SO20

Power Bridge Packages



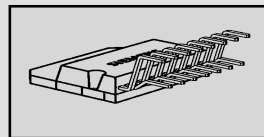
TO 220-7

TLE 4202B
TLE 4203
TLE 5203
TLE 5205
TLE 5207



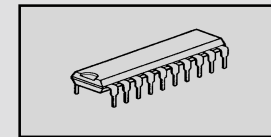
TO 220-7 SMD

TLE 5203G
TLE 5204G
TLE 5205G
TLE 5207G



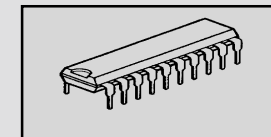
SIP-9/15

TCA 2465
TLE 5250



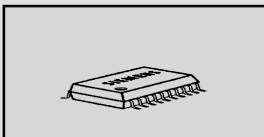
DIP-18

TLE 4205



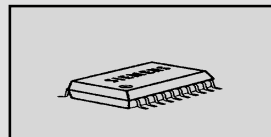
DIP-20

TCA 3727
TLE 4727



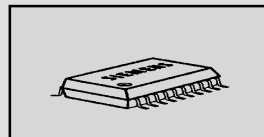
SO-14

TLE 4206
TLE 4207



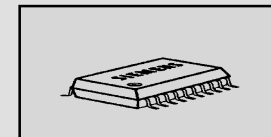
SO-20

TCA 2465G
TLE 4205G



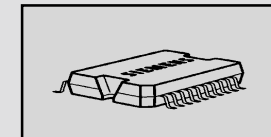
SO-24

TCA 3727G
TLE 4728G
TLE 4729G



SO-28

BTS 770
BTS 771
TLE 5208-6



POWER-SO-20

TLE 5205GP
TLE 5206GP