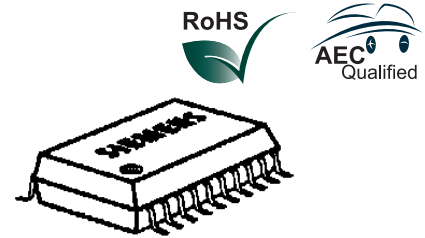


The device allows continuous power control for lamps, LEDs or inductive loads.

- Highside switch (Bootstrap)
- Overtemperature protection
- Short circuit / overload protection through pulse width reduction and overload shutdown
- Load dump protection
- Undervoltage and overvoltage shutdown with auto-restart and hysteresis
- Reverse battery protection ¹⁾
- Timing frequency adjustable
- Controlled switching rise and fall times
- Maximum current internally limited
- Protection against loss of GND ²⁾
- Electrostatic discharge (ESD) protection
- Package: P-DSO-20-6 (SMD)



PG-DSO20

Note: Switching frequency is programmed with an external capacitor

- RoHS compliant (green product)
- AEC qualified

Maximum Ratings

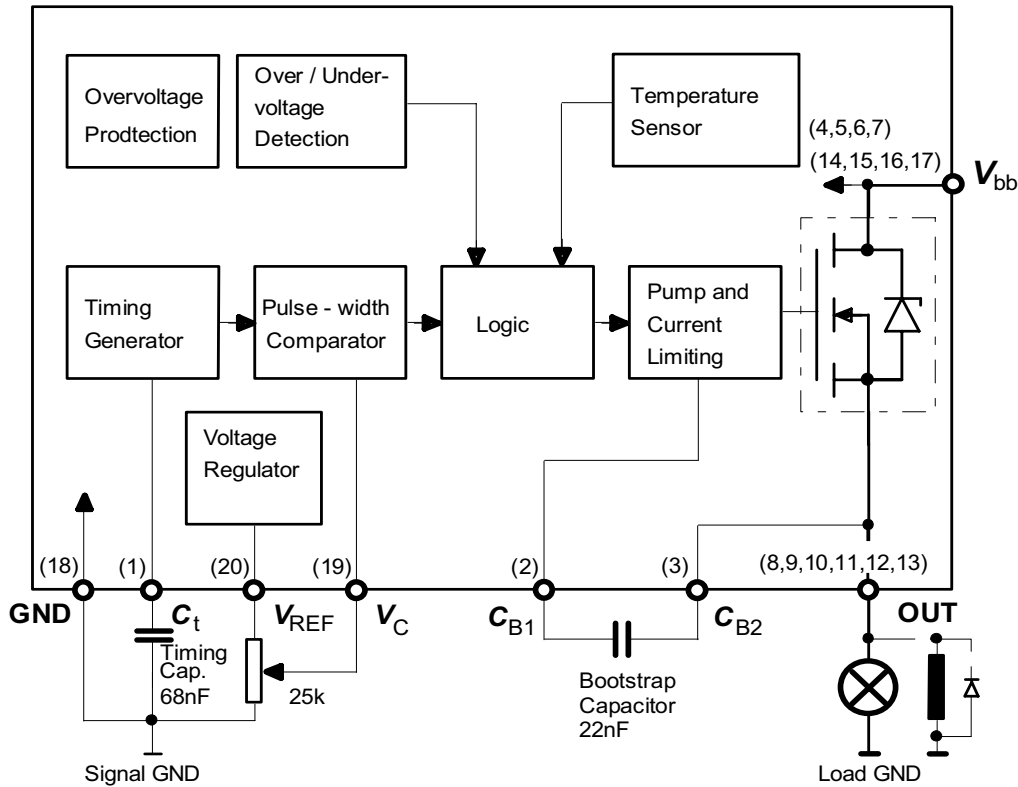
Parameter	Symbol	Values	Unit
Active overvoltage protection	$V_{bb(AZ)}$	>40	V
Short circuit current	I_{SC}	self-limited	-
Input current (DC)	I_{Ct}	2	mA
Pin1 (C_t) and pin19 (V_C)	I_{VC}	2	mA
Operating temperature range	T_j	-40...+150	°C
Storage temperature range	T_{stg}	-50...+150	
Power dissipation ³⁾	$T_a=25^{\circ}C$	3	W
	$T_a=85^{\circ}C$	2	W
Thermal resistance chip-case ³⁾	$R_{th JC}$	≤35	K/W
	chip-ambient	$R_{th JA}$	≤75
Electrostatic discharge capability (ESD) (Human Body Model) acc. MIL-STD883D, method 3015.7 and ESD assn. std. S5.1-1993; R=1.5KΩ; C=100pF	V_{ESD}	≤ 1	kV

¹⁾ With 150Ω resistor in signal GND connection.

²⁾ Potential between signal GND and load GND >0.5V

³⁾ Device on 50mm×50mm×1.5mm epoxy PCB FR4 with 6 cm² (one layer, 70µm thick) copper area for V_{bb} connection, PCB is vertical without air blowing.

Block Diagram



Pin Definitions and Funktionen

Pin	Symbol	Funktionen
1	C_t	Timing capacitor for frequency
2	C_{B1}	Bootstrap capacitor
3	C_{B2}	
4,5,6,7 14,15,16,17	V_{bb}	Supply voltage (Leadframe connected)
8,9,10 11,12,13	OUT	Output
18	GND	Ground
19	V_C	Voltage for PWM-Control
20	V_{REF}	Reference Voltage

Pin Configuration (top view)

C_t	1	20	V_{REF}
C_{B1}	2	19	V_C
C_{B2}	3	18	GND
V_{bb}	4	17	V_{bb}
V_{bb}	5	16	V_{bb}
V_{bb}	6	15	V_{bb}
V_{bb}	7	14	V_{bb}
OUT	8	13	OUT
OUT	9	12	OUT
OUT	10	11	OUT

Electrical Characteristics

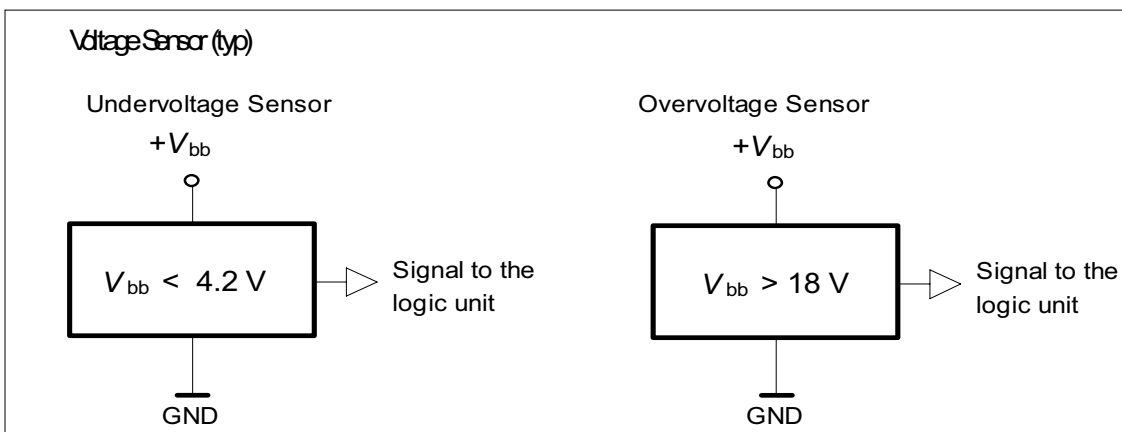
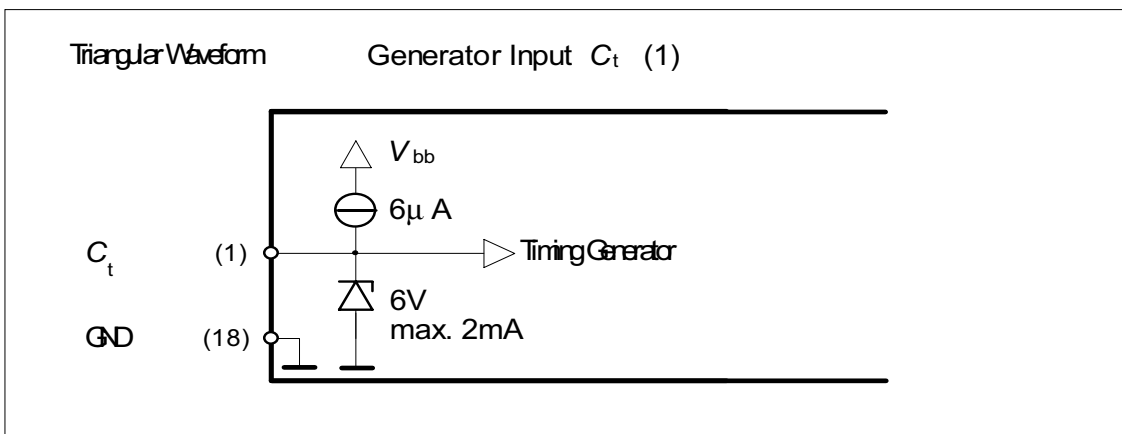
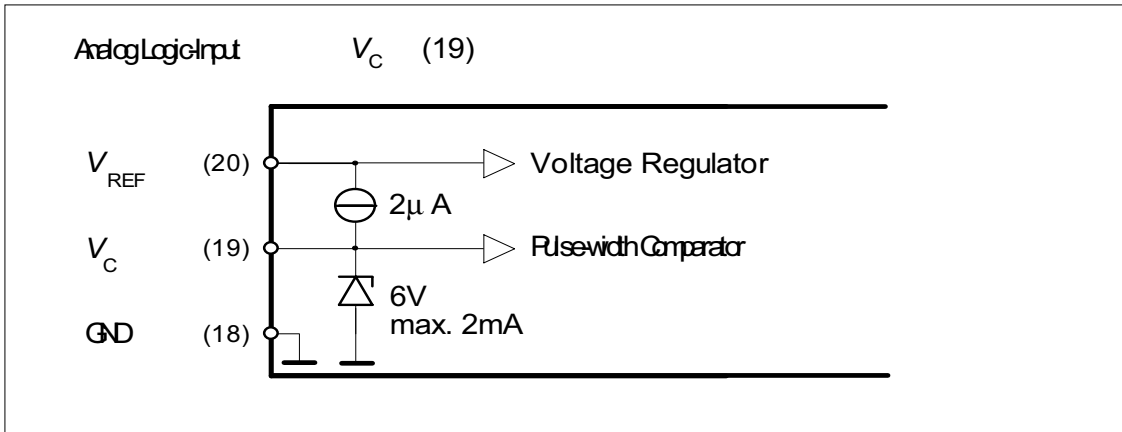
 at $T_C = 25\text{ °C}$, $V_{bb} = 12\text{ V}$, unless otherwise specified. $C_{\text{Bootstrap}} = 22\text{ nF}$

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
On-state resistance $I_L=3\text{A}$, $V_{bb}=12\text{V}$	R_{ON}	-	-	70	m Ω
Operating voltage $T_C = -40 \dots +150\text{ °C}$	V_{bb}	5.9 ¹⁾	-	16.9 ²⁾	V
Nominal current, calculated value ISO-standard: $V_{bb}-V_{\text{OUT}} \leq 0.5\text{V}$, $T_C = 85\text{ °C}$	$I_L\text{-ISO}$	3	-	-	A
Load current limit $V_{bb}-V_{\text{OUT}} > 1\text{V}$, $T_C = -40 \dots +150\text{ °C}$	I_{LLim}	-	20	-	A
Undervoltage shutdown $I_L = 3\text{A}$, $T_C = -40 \dots +150\text{ °C}$	$V_{bb(\text{LOW})}$	3	4.2	5.4	V
Overvoltage shutdown $I_L = 3\text{A}$, $T_C = -40 \dots +150\text{ °C}$	$V_{bb(\text{HI})}$	17	18	19	V
Max.output voltage (RMS) $I_L = 3\text{A}$, $V_{bb} > 12\text{ V}$ $T_C = -40 \dots +150\text{ °C}$	V_{RMSmax}	12	-	14	V
Reference voltage $I_{\text{REF}} = 10\text{mA}$, $T_C = -40 \dots +150\text{ °C}$	V_{REF}	2		3	V
Reference current pin 18 (GND) to pin 20 (V_{REF}) short	I_{REF}	-	150	-	mA
Internal current consumption during operation, measured in PWM gap $T_C = -40 \dots +150\text{ °C}$	I_{R}	-		5	mA
Bootstrap voltage, pin 2 (C_{B1}) to pin 3 (C_{B2}) $V_{bb} = 12\text{ V}$, $T_C = -40 \dots +150\text{ °C}$	V_{B}	-	10	-	V
PWM frequency $T_C = -40 \dots +150\text{ °C}$, $C_t = 68\text{ nF}$	f_{PWM}	50	-	100	Hz
Max. pulse duty factor $I_L = 3\text{A}$, $V_C=0\text{V}$, (50% V_{OUT})	D_{imax}	95	98	-	%
Min. pulse duty factor $I_L = 3\text{A}$, $V_C=0\text{V}$, (50% V_{OUT})	D_{imin}	3	8	14	%
Slew rate "on" 10 ... 90% I_{OUT}	$du/dt_{(\text{on})}$	20	-	120	mV/ μs
Slew rate "off" 90 ... 10% I_{OUT}	$du/dt_{(\text{off})}$	20	-	120	mV/ μs
Thermal overload trip temperature	T_j	150	-	-	°C

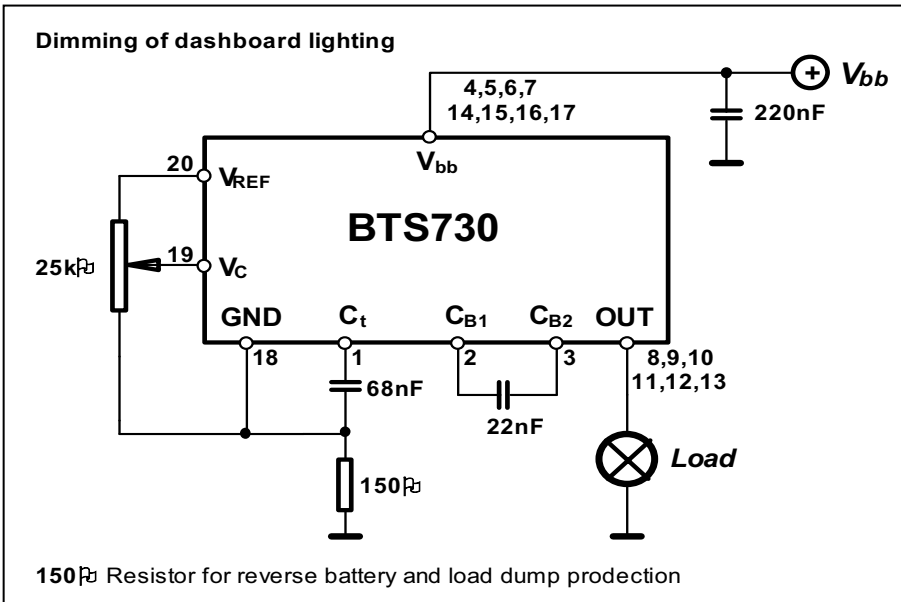
¹⁾ **Note:** undervoltage shutdown

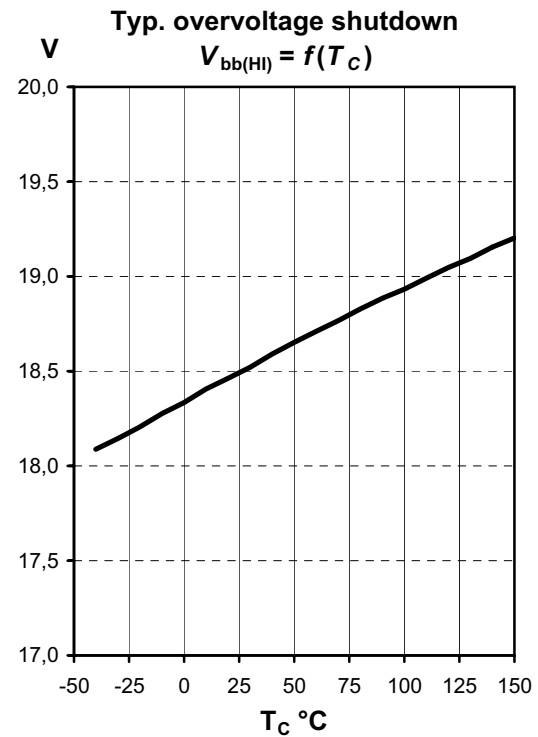
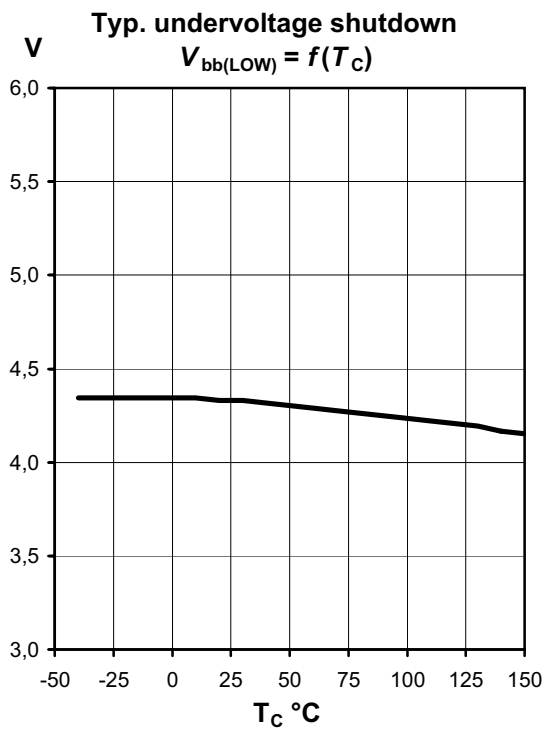
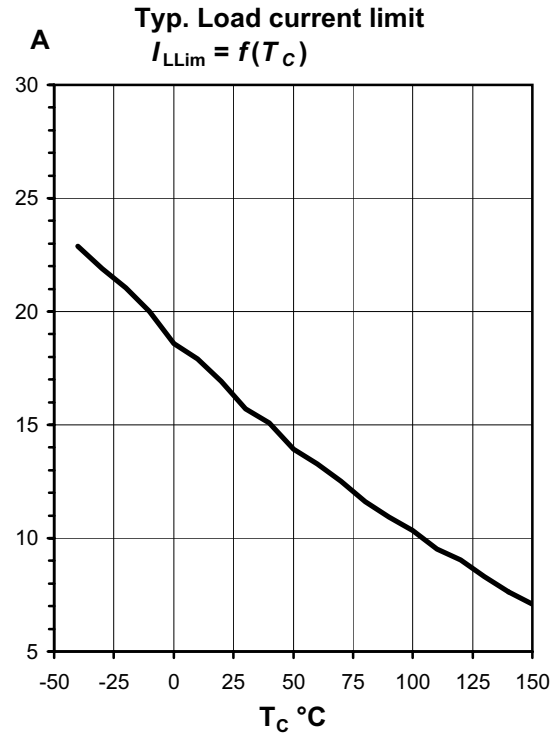
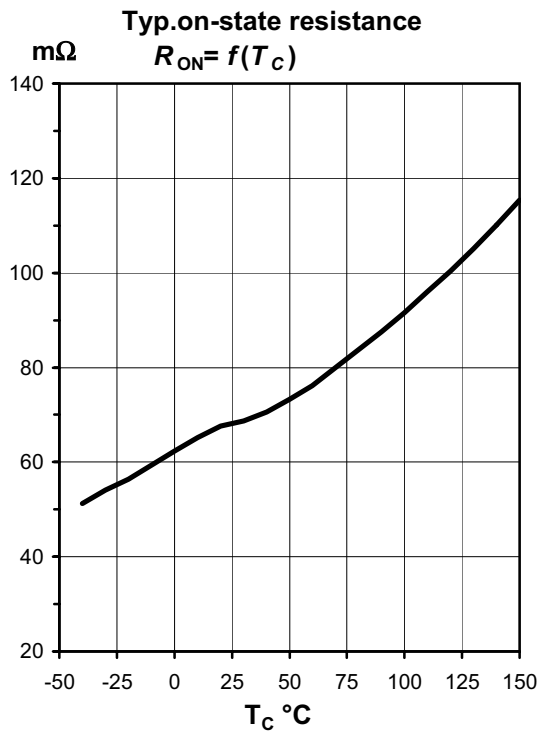
²⁾ **Note:** overvoltage shutdown

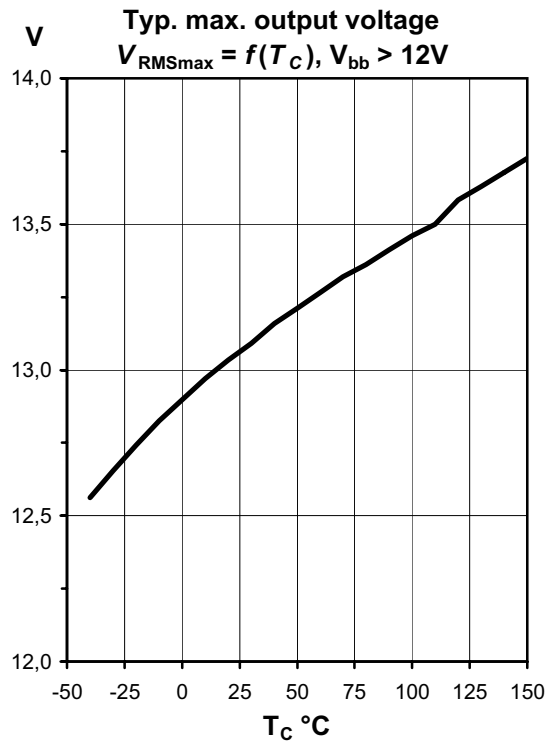
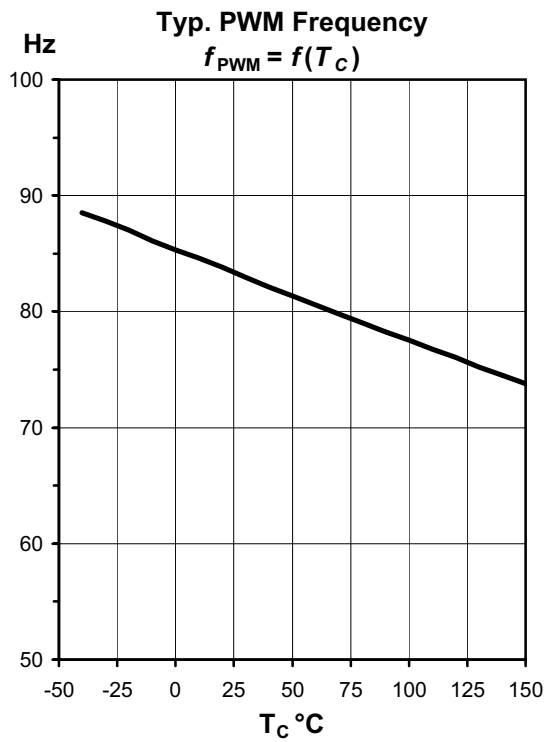
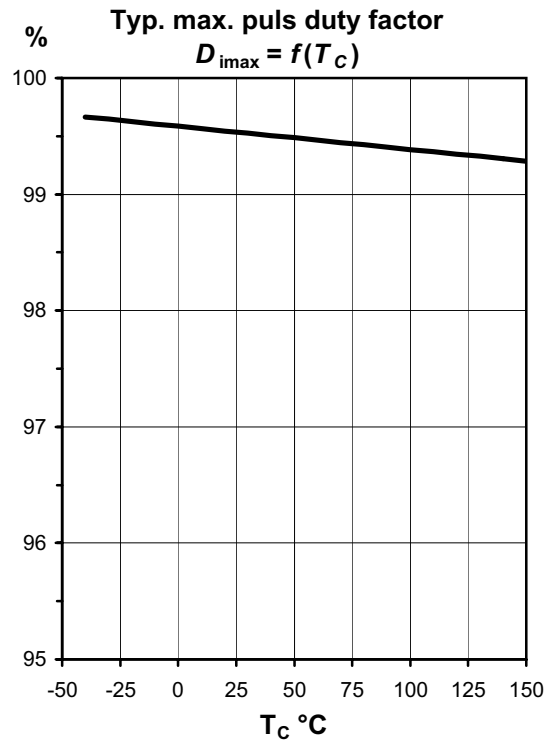
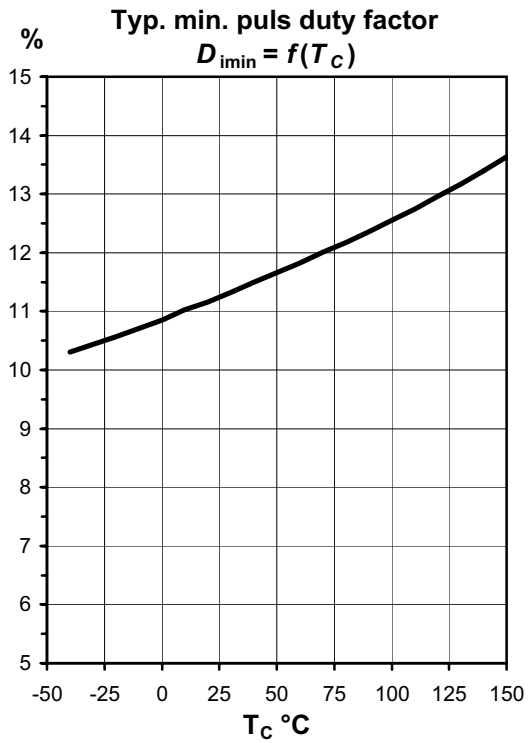
Circuits



Application Note







Package Outlines

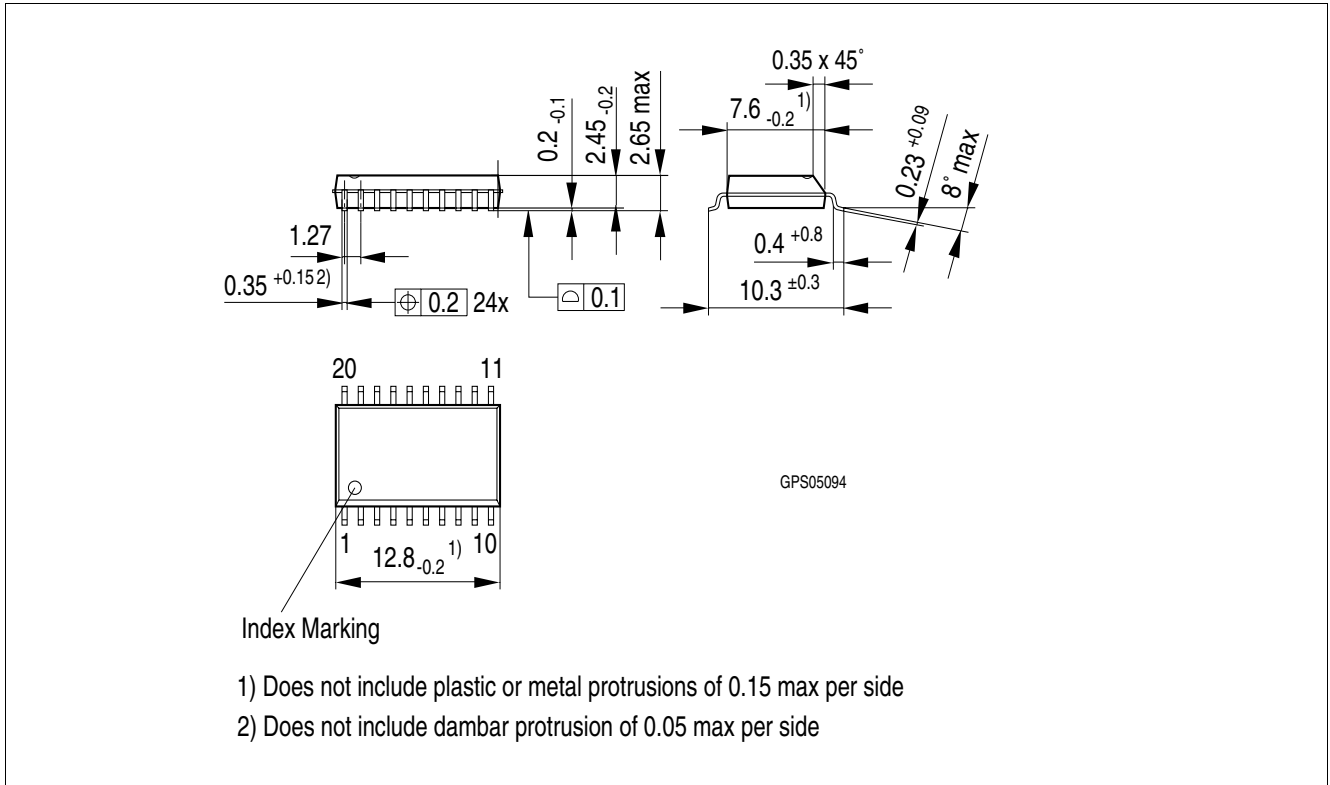


Figure 1 PG-DSO-20 (Plastic Dual Small Outline Package) (RoHS-compliant)

To meet the world-wide customer requirements for environmentally friendly products and to be compliant with government regulations the device is available as a green product. Green products are RoHS-Compliant (i.e Pb-free finish on leads and suitable for Pb-free soldering according to IPC/JEDEC J-STD-020).

Please specify the package needed (e.g. green package) when placing an order

Revision History

Version	Date	Changes
V1.0	2007-12-17	Creation of the green datasheet. First page : Adding the green logo and the AEC qualified Adding the bullet AEC qualified and the RoHS compliant features Package page Modification of the package to be green.

Edition 2007-12-17

**Published by
Infineon Technologies AG
81726 Munich, Germany**

**© Infineon Technologies AG 12/17/07.
All Rights Reserved.**

Legal Disclaimer

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics ("Beschaffenhheitsgarantie"). With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation warranties of non-infringement of intellectual property rights of any third party.

Information

For further information on technology, delivery terms and conditions and prices please contact your nearest Infineon Technologies Office (www.infineon.com).

Warnings

Due to technical requirements components may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies Office.

Infineon Technologies Components may only be used in life-support devices or systems with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support device or system, or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body, or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.