

Torex...Powerfully Small!

AEC-Q100 Grade1 qualified
36V 600mA Synchronous Step-down DC/DC Converter
XD9704/XD9705 Series

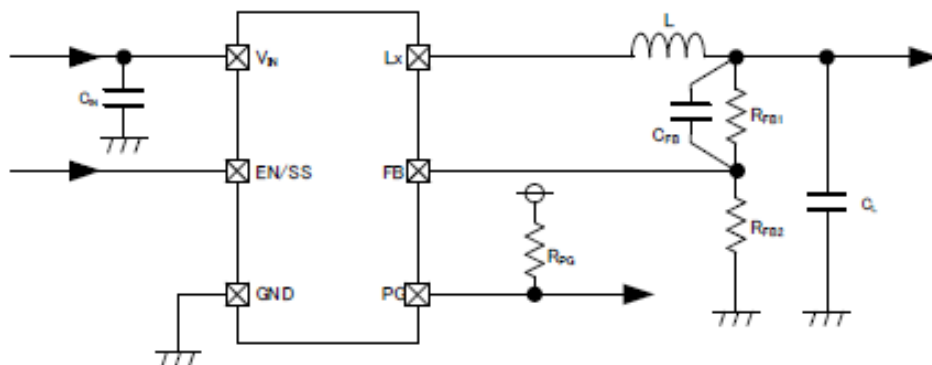
August 2026
TOREX SEMICONDUCTOR LTD.
Rev. 1.1

AEC-Q100 Grade1 / Small solution / High efficiency at light loads / Sequence controllable

Features

Input Voltage	: 3.0V ~ 36.0V (Absolute Max.:40.0V)
Surge Voltage	: 46.0V (Applied Time $\leq$ 400ms)
Output Voltage Range	: 2.8V ~ 20.0V (XD9704) : 2.8V ~ 15.0V (XD9705)
FB Voltage	: 0.75V($\pm$ 1.5%)
Output Current	: 600mA
Supply Current	: 11 μ A
Oscillation Frequency	: 2.2MHz
Efficiency	: 88% ($V_{IN}=12V$, $V_{OUT}=5V$, $I_{OUT}=300mA$)
Control Method	: F-PWM (XD9704), PWM/PFM (XD9705)
Function	: Soft-start (External Adj.), UVLO Power Good (DFN1820-6J)
Protection	: Current Limit, Thermal Shutdown
Package	: SOT-89-5 (Without PG) DFN1820-6J (With PG, Wettable Flank)
Junction Temp	: -40°C ~ 150°C

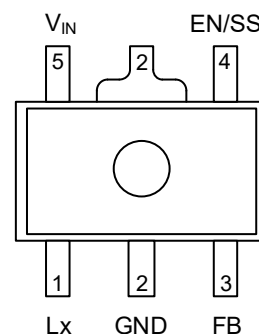
Typical Application Circuit



Packages

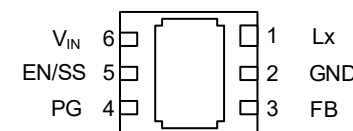
SOT-89-5
(4.5x4.6x1.6mm)

TOREX Longevity
Program (TLP)



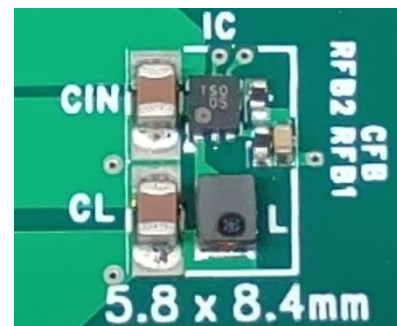
DFN1820-6J (Under Development)
(1.8x2.0x0.6mm)

TOREX Longevity
Program (TLP)



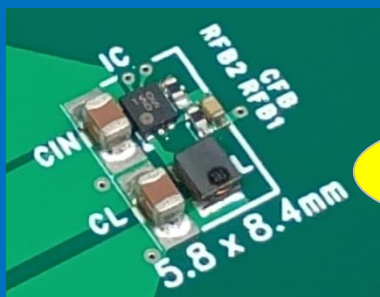
world's smallest
in terms of
mounting area

Mounting Area



■ Space-Saving and Low Iq Step-down DC/DC for Medium and High Voltage Inputs

Compact/Low Iq
36V 600mA Step-down DC/DC
XD9704/XD9705



Small
Mounting Area

①

① Ultra-small / High efficiency at light load

- ✓ Synchronous rectification
- ✓ Small external components can save space
- ✓ High efficiency at light load

②

② Simple power source sequence control

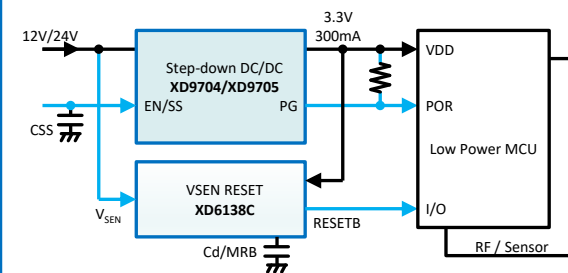
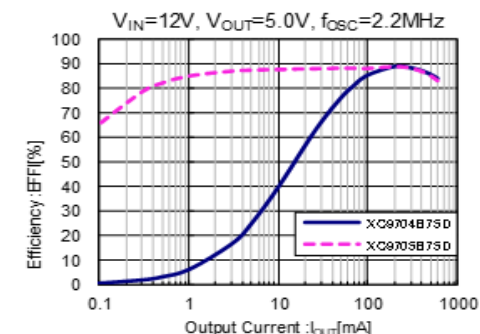
- ✓ Soft start can be adjusted externally to accommodate large output capacitors
- ✓ Power Good function can be used to drive the latter-stage IC after the output voltage rises.

③

③ Stable output voltage supply even when input voltage drops

- ✓ Supplies stable output voltage even when input voltage drops as it supports 100% Max Duty.

Pch driver FET
100% Duty



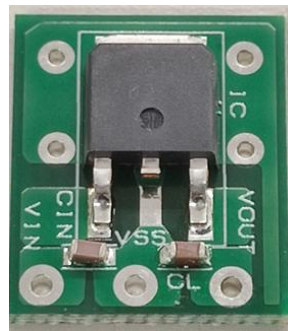
Ideal for miniaturization / heat dissipation due to small size / low Iq.

Also suitable for replacing conventional high-voltage LDOs.

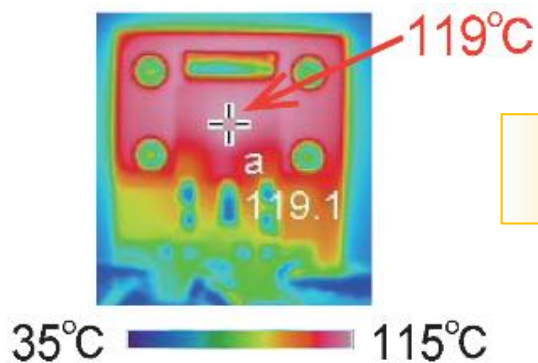
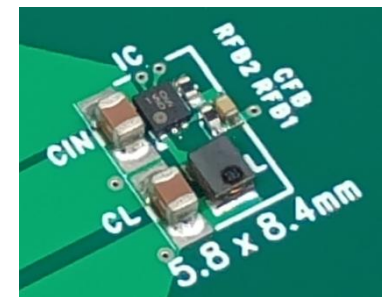
- In-vehicle camera modules (viewing, sensing), drive recorders
- In-vehicle applications (HUD, lights), various ECUs, sensor devices

■ Recommended for Replacement of Voltage Regulators

Due to the addition of new functions, the current increased, raising concerns about the regulator's heat dissipation. By replacing the regulator with a DC/DC converter, **we not only improved heat dissipation but also reduced the size.**

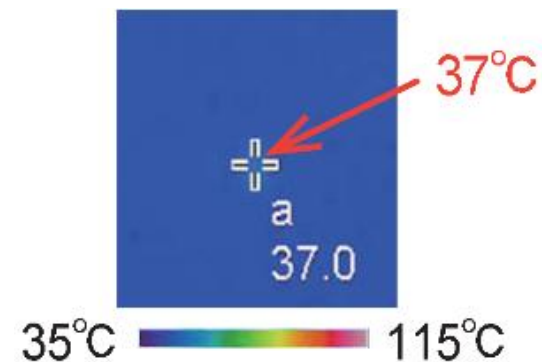


Mounting Area : 1/2



LDO

loss: 1/10



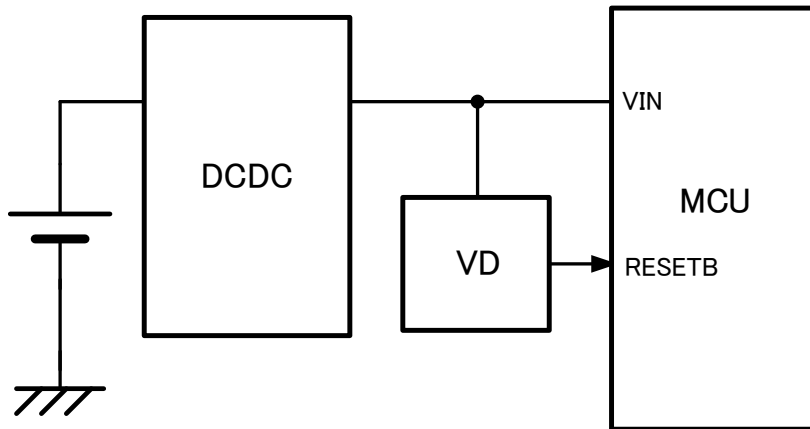
XD9704/XD9705

■ Power Good Function Contributes to Stable System Drive (Only DFN1820-6J)

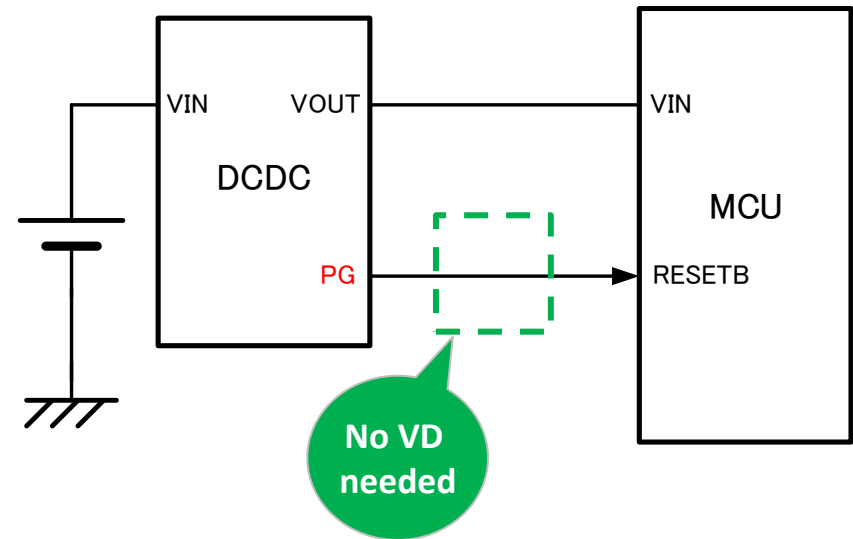
The power good function (flags when the output reaches a set voltage level) enables the following.

- No voltage detector (VD) is required to monitor output voltage.
- Sequence control is possible when combined with the soft-start external adjustment function.

【Typical output voltage monitoring circuit configuration】



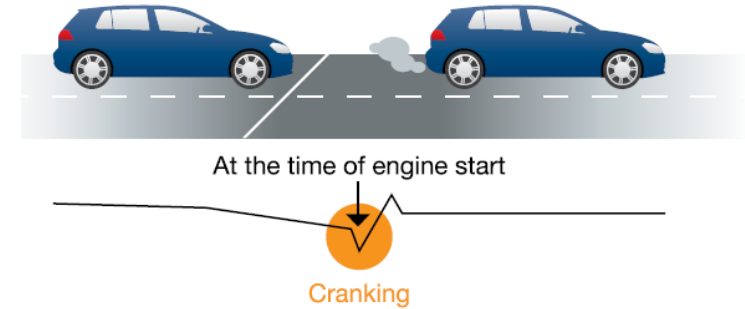
【XD9704/XD9705 circuit configuration】



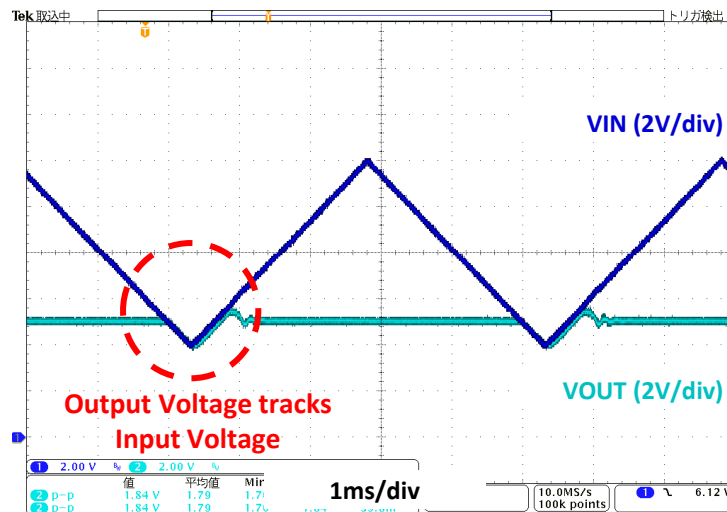
■ Supports 100% Duty cycle and Maintains a High Output Voltage Even When the Input Voltage Drops.

Features of 100% Max Duty Support

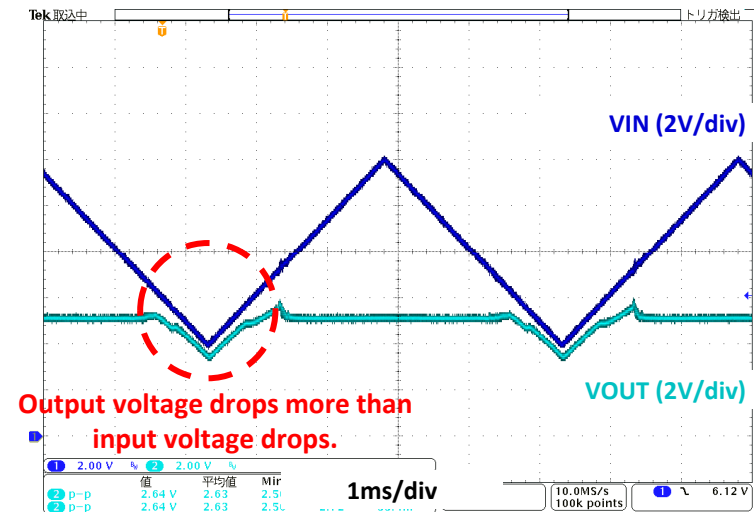
- Even if the input voltage is close to the output voltage, **there is no drop in the output voltage.**
- When the input voltage is lower than the set output voltage, the input voltage is passed through to the output and **the output voltage is maintained as high as possible.**



Effectively suppresses system downtime caused by a drop in power supply voltage during cold cranking.



Max Duty 100% Supported
XD9704/XD9705

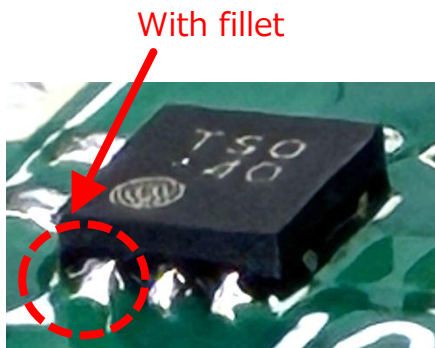


Max Duty 100% Not supported
General Step Down DC/DC

■ Improved Mounting Reliability of Leadless Packages with Wettable Flank Structure (DFN1820-6J)

By adopting the wettable flank structure, solder joint reliability is enhanced while enabling automated optical inspection (AOI) after assembly - eliminating the key drawbacks of conventional leadless packages.

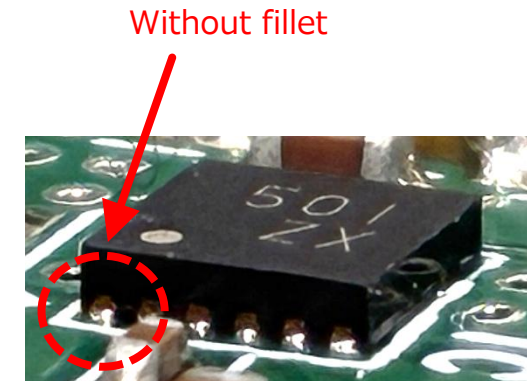
Wettable Flank Structure



Fillet formed on side wall
Visual Inspection Possible

The terminal side is plated.
Solder wets up the side, forming a visible fillet (raised solder) that can be checked from the side.

Conventional Leadless Package



No Fillet Formed
Visual Inspection Difficult

The terminal side is not plated.
No solder fillet is formed.