

Torex...Powerfully Small!

Voltage Regulators & RESET ICs for Automotive Product Overview

September 2023
TOREX Semiconductor
Rev. 1.0

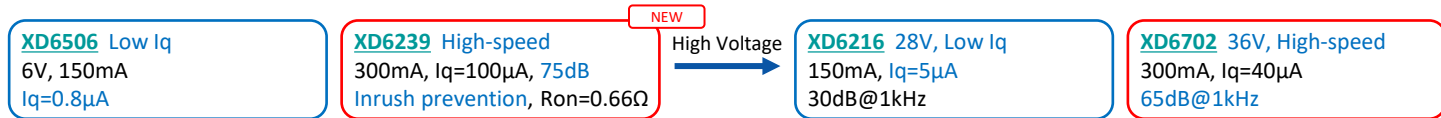
■ Features of TOREX Automotive ICs (XD Series)

- Automotive reliability support : AEC-Q100 compliant.
- Quality management : Statistical Process Control (SPC) and Measurement System Analysis (MSA) are used for process control.
- Manufacturing process control : AEC-Q001 / AEC-Q002 compliant.
- Traceability : Manufacturing/sales traceability is enhanced compared to general products (XC series).

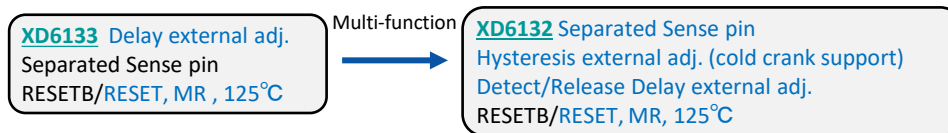
■ Typical Automotive ICs (XD Series)



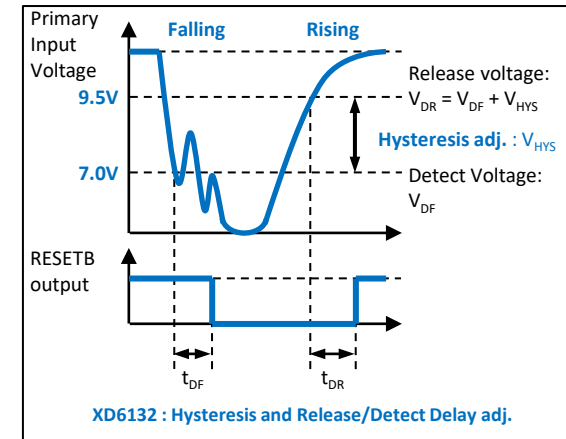
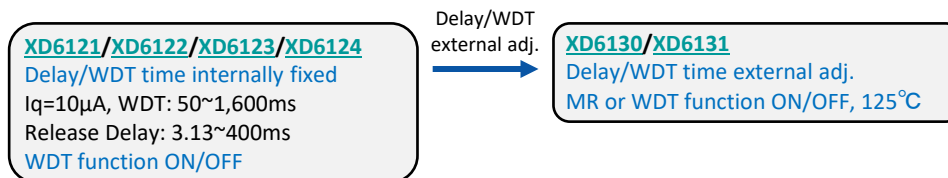
➤ Voltage Regulator



➤ Reset IC



➤ Watchdog Timer (WDT) + Voltage Detector

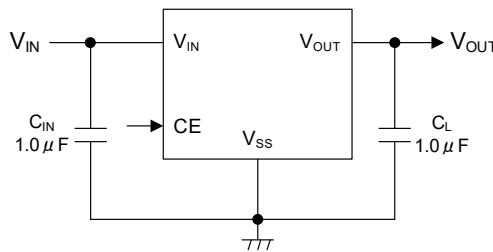
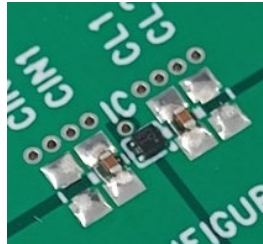


NEW

■ **XD6239** -125°C 300mA High Speed LDO

- AEC-Q100 Grade1
- High Speed / High PSRR

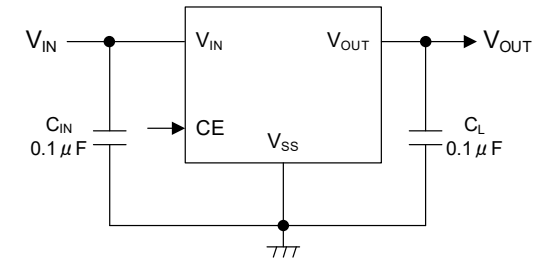
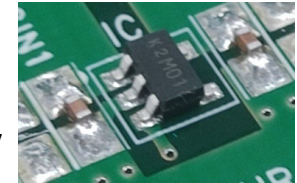
V_{IN} : 2.0V ~ 6.0V
 V_{OUT} : 1.2V ~ 3.4V
 I_{OUT} : 300mA
 I_q : 100 μ A
 R_{on} : 0.66 Ω
 PSRR : 75dB @1kHz
 Function : Inrush Current Protection
 T_{opr} : -40°C ~ 125°C
 Package : DFN1010-4C (1.0x1.0x0.6mm)
 SOT-25
 SOT-89-5



■ **XD6506** - 28V 150mA Ultra Low Power LDO

- AEC-Q100 Grade2
- Ultra Low Power 0.8 μ A

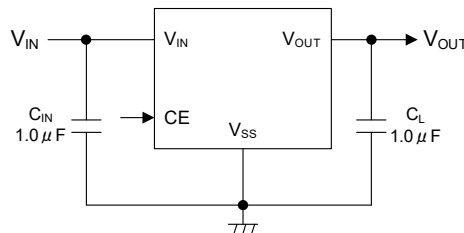
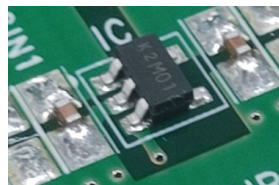
V_{IN} : 1.5V ~ 6.0V
 V_{OUT} : Standard 1.2V, 1.5V, 1.8V, 2.5V, 2.8V, 3.0V, 3.3V, 5.0V
 Option 1.2V ~ 5.0V (0.1V increments)
 I_{OUT} : 150mA
 I_q : 0.8 μ A
 PSRR : 35dB @1kHz
 Function : Current Limit
 T_{opr} : -40°C ~ 105°C
 Package : SOT-25



■ **XD6216** - 28V 150mA Ultra Low Power LDO

- AEC-Q100 Grade2, 28V / 150mA
- Low Power

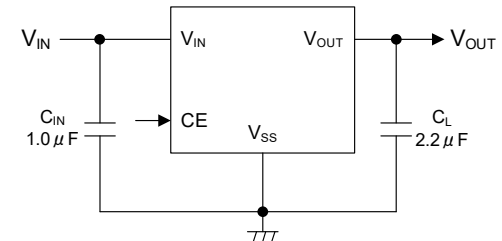
V_{IN} : 2.0V ~ 28.0V
 V_{OUT} : 1.8V ~ 12.0V
 I_{OUT} : 300mA
 I_q : 5 μ A
 PSRR : 30dB @1kHz
 Function : Thermal Shutdown
 Current Limit
 T_{opr} : -40°C ~ 105°C
 Package : SOT-25
 SOT-89-5



■ **XD6702** - 36V 300mA Low Power, High Speed LDO

- AEC-Q100 Grade2
- High Speed / Low Speed / Low Power

V_{IN} : 4.5V ~ 36.0V
 V_{OUT} : 1.8V ~ 18.0V
 I_{OUT} : 300mA
 I_q : 40 μ A
 PSRR : 65dB @1kHz
 Function : Thermal Shutdown
 Current Limit
 Soft-Start
 T_{opr} : -40°C ~ 105°C
 Package : SOT-89-5

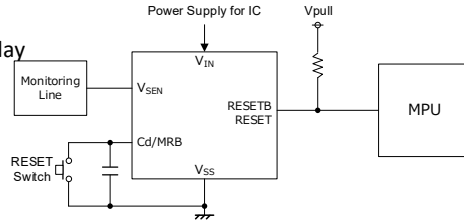


RESET ICs for Automotive: Featured Products

■ [XD6133](#) - Separated Sense Pin, Release/Detect delay Adj. Voltage Detector

- AEC-Q100 Grade1
- Separated Sense Pin / Release delay / Detection delay Adj.

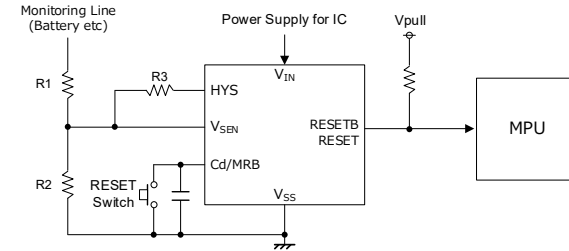
V_{IN}	: 1.6V ~ 6.0V
V_{DF}	: Standard 1.3V, 1.6V, 2.2V, 2.3V, 2.4V, 2.9V, 3.0V, 3.1V, 4.4V, 4.5V, 4.6V Option 1.0V ~ 5.0V
Accuracy	: $\pm 1.2\%$
I_q	: 1.28 μ A
Output Type	: CMOS, Nch Open drain
Output Logic	: "H" level or "L" level at detection
Function	: Separated Sense Pin Manual Reset Release delay / Detection delay
Topr	: -40°C ~ 125°C
Package	: SOT-26 USP-6C



■ [XD6132](#) - Separated Sense Pin(Surge Protection),HYS Adj, Voltage Detector

- AEC-Q100 Grade1
- Separated Sense Pin(Surge Protection)
- Release delay / Detection delay Adj.

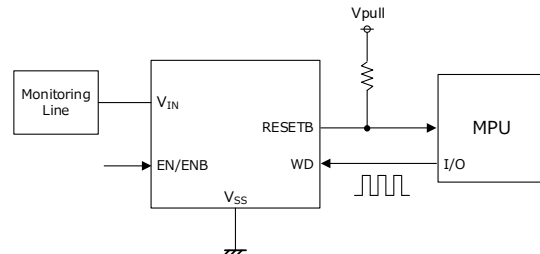
V_{IN}	: 1.6V ~ 6.0V
V_{DF}	: Standard 1.0V Option 0.8V ~ 2.0V
Accuracy	: $\pm 1.2\%$
I_q	: 1.28 μ A
Output Type	: CMOS, Nch Open drain
Output Logic:	: "H" level or "L" level at detection
Function	: Separated Sense Pin Manual Reset Release delay / Detection delay Adj Hysteresis Width Surge Protection
Topr	: -40°C ~ 125°C
Package	: SOT-26, USP-6C



■ [XD6121/22/23/24](#) - Voltage Detector with Watchdog Function

- AEC-Q100 Grade3
- Watchdog function / Watchdog ON/OFF
- Delay time internal fixed

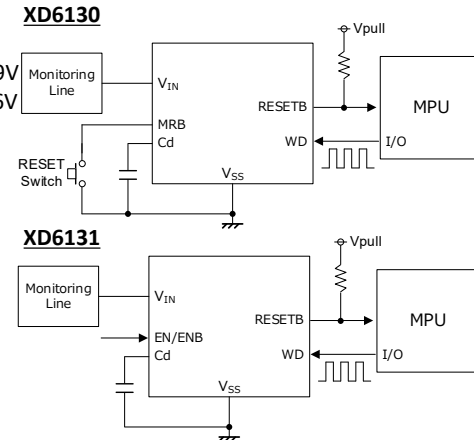
V_{IN}	: 1.0V ~ 6.0V
V_{DF}	: Standard 1.6V, 2.2V, 2.3V, 2.4V, 2.9V, 3.0V, 3.1V, 4.4V, 4.5V, 4.6V
Accuracy	: $\pm 2.0\%$
Output Type	: Nch Open drain
Output Logic	: "L" level at detection
Function	: Watchdog function Watchdog ON/OFF
Topr	: -40°C ~ 85°C
Package	: SOT-25



■ [XD6130/XD6131](#) - High Precision RESET IC with Adjustable Watchdog Timer

- AEC-Q100 Grade1
- Watchdog function / Watchdog ON/OFF
- Manual Reset / Delay time Adj.

V_{IN}	: 1.5V ~ 6.0V
V_{DF}	: Standard 1.6V, 2.2V, 2.3V, 2.4V, 2.9V, 3.0V, 3.1V, 4.4V, 4.5V, 4.6V Option 1.6V ~ 5.0V
Accuracy	: $\pm 1.0\%$
Output Type	: Nch Open drain
Output Logic	: "L" level at detection
Function	: Manual Reset (XD6130) Watchdog ON/OFF (XD6131)
Topr	: -40°C ~ 125°C
Package	: SOT-26



■ Voltage Regulator

Product	AEC-Q100	Feature	V _{IN} [V]	V _{OUT} [V]	I _{OUT} [mA]	I _q [μA]	R _{on} [Ω]	PSRR @1kHz [dB]	Function			Topr max.	Package
									CE	Current Limit	Other		
XD6506	Grade2	I _q =0.8μA, 150mA	1.5~6.0	1.2~5.0	150	0.8	2.60	35	Yes	FB+ILIM	-	105°C	SOT-25 (2.9x2.8x1.3mm)
NEW XD6239	Grade1	300mA High Speed	2.0~6.0	1.2~3.4	300	100	0.66	75	Yes	FB+ILIM	Inrush/TSD/CL Dischg	125°C	DFN1010-4C (1.0x1.0x0.6mm) SOT-25 (2.9x2.8x1.3mm) SOT-89-5 (4.5x4.35x1.6mm)
XD6216	Grade2	28V, 150mA	2.0~28.0	1.8~12.0	150	5	6.50	30	Yes	FB+ILIM	TSD	105°C	SOT-25 (2.9x2.8x1.3mm) SOT-89-5 (4.5x4.35x1.6mm)
XD6702	Grade2	36V (46V/400ms) High Speed, Low I _q	4.5~36.0	1.8~18.0	300	40	3.50	65	Yes	FB+ILIM	SoftStart/TSD	105°C	SOT-89-5 (4.5x4.60x1.6mm)

■ Reset IC, Watchdog Timer

▷ Reset Ics

Product	AEC-Q100	Feature	V _{IN} [V]	V _{DF} [V]	Accuracy	I _q [μA]	Output		Voltage Detect			
							Configuration	Logic	Separate Sense Pin	Detect Delay time	Release Delay time	Hys
XD6132	Grade1	Ta=-40~125°C, Hys adj, Separate Sense pin, Adj Release/Detect Delay	1.6~6.0	0.8~2.0	1.2%	1.32	CMOS N-ch	Active "H" Active "L"	Yes	adj	adj	adj
XD6133				1.0~5.0								VDFx5%

▷ Reset ICs with Watchdog function

Product	AEC-Q100	Feature	V _{IN} [V]	V _{DF} [V]	Accuracy	I _q [μA]	Output		Voltage Detect			
							Configuration	Logic	Separate Sense Pin	Detect Delay time	Release Delay time	Hys
XD6130	Grade1	Ta=-40~125°C, RESET with Watchdog, Adj Delay time	1.5~6.0	1.6~5.0	1.0%	9.8	N-ch	Active "L"	-	-	adj	VDFx5%
XD6131						2.5@EN=L 9.8@EN=H						
XD6121-XD6124	Grade3	RESET with Watchdog, EN Built-in Delay time	1.0~6.0	1.6~5.0	2.0%	10	N-ch	Active "L"	-	-	3.13ms ~400ms	VDFx5%