

Torex...Powerfully Small!

AEC-Q100 Grade1
Voltage Detector with Delay Function,
SENSE Pin(76V/Max)
XD6138 series Product Overview

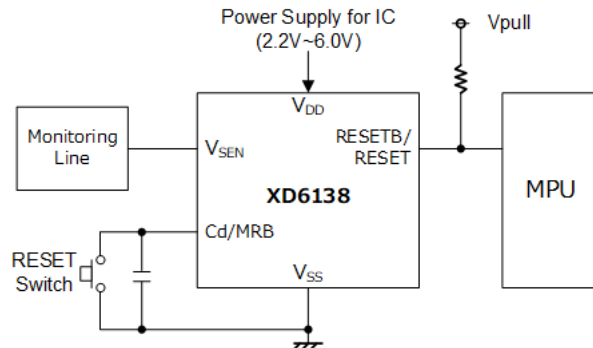
Feb, 2025
TOREX SEMICONDUCTOR LTD.
Rev. 1.0

AEC-Q100 Grade1 / Detect (V_{SEN}) pin 76V operation / Wide range of hysteresis settings

FEATURES

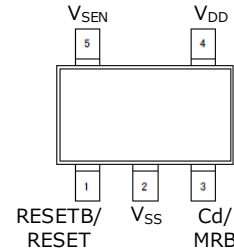
Operating Voltage	: 2.2V ~ 6.0V (Abs Max : 6.6V)
V_{SEN} Voltage Range	: 0V ~ 76.0V (Surge Voltage: 90.0V, $\leq 400ms$)
Detect Voltage Range	: 2.3V ~ 20.0V
Release Voltage Range	: 2.5V ~ 24.0V
Hysteresis Width	: 5% ~ 50% of the detect voltage
Supply Current	: V_{DD} : 0.5 μA V_{SEN} : 0.15 μA @ $V_{SEN}=12V$
Detect Voltage Accuracy	: $\pm 1.5\%$ ($T_a=25^\circ C$), $\pm 3.0\%$ ($T_a=-40^\circ C \sim 125^\circ C$)
Release Voltage Accuracy	: $\pm 1.5\%$ ($T_a=25^\circ C$)
Temperature Characteristics	: $\pm 50ppm/^\circ C$
Output Type	: CMOS, Nch open drain
Output Logic	: "H" level or "L" level at detection
Delay Time	: 10.0ms ($C_d=0.01\mu F$) ✳ Selectable delay time ratio
Package	: SOT-25 (2.8 x 2.9 x 1.3mm)
Operating Ambient Temp	: $-40^\circ C \sim 125^\circ C$ ($T_{jmax}=150^\circ C$)

TYPICAL APPLICATION

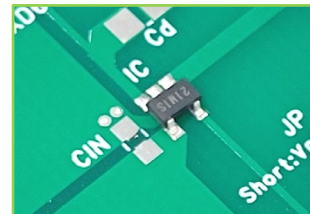


PACKAGE

SOT-25
(2.8x2.9x1.3mm)

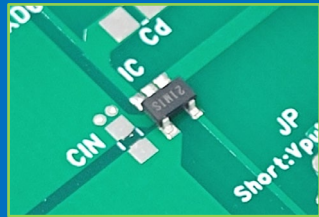


Space Saving



- XD6138 can directly monitor a car battery like 12V or 24V

Voltage Detector with Delay Function, SENSE Pin XD6138



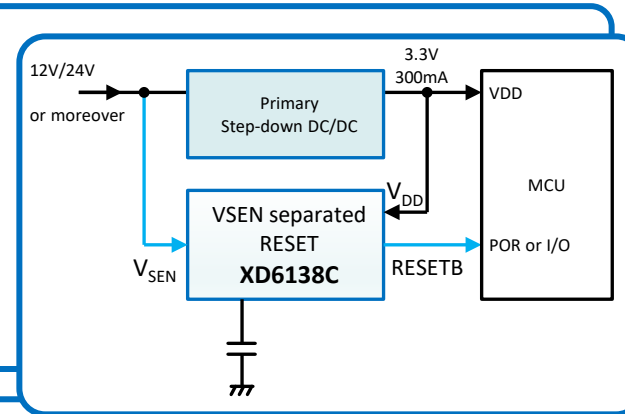
No need for resistor divider circuit

①

① Direct monitoring of high voltage

“No need for resistor divider circuit”

- ✓ Reduction of dark current when the ACC power is off.
- ✓ High accuracy
- ✓ Surge voltage : 90V@400ms



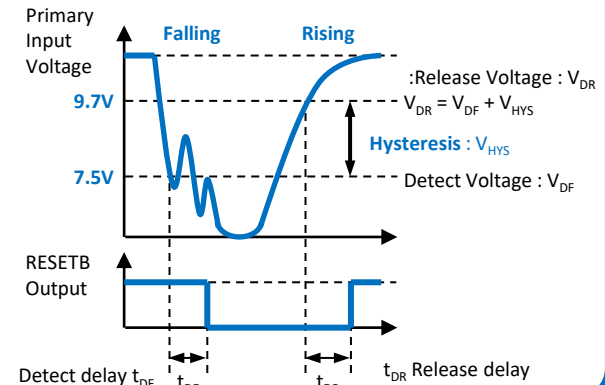
②

② Optimum detect/release voltage for each application

- ✓ An abundant voltage lineup for 12V/24V
- ✓ Voltage combination according to power supply fluctuations.
- ✓ Detect and Release delay can be specified separately

Detect/Release voltage settings according to application

12V input monitoring



Achieving high accuracy, low Iq, and space-saving through direct monitoring of high voltage, with support for 125°C and 90V surge voltage.

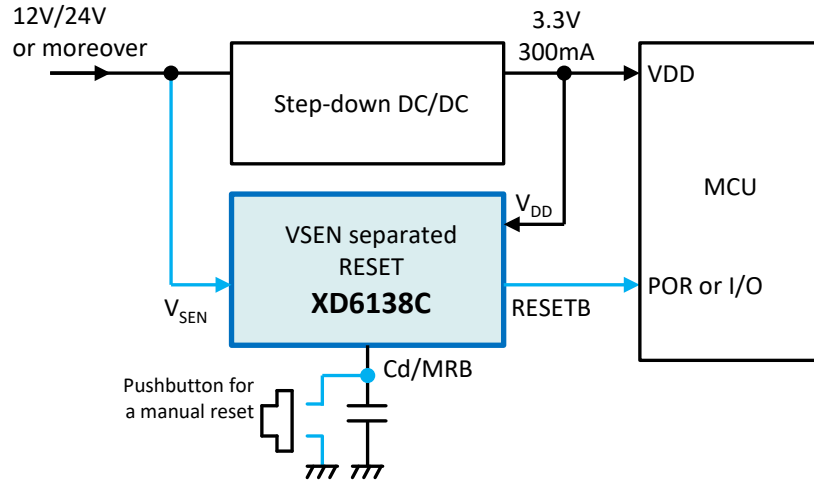
- For Automotive camera, body control application system, panel, GPS, USB, etc.

Wider hysteresis lineup

- Suitable for power supply lines with large voltage fluctuations during cranking

■ Directly monitors a car battery like 12V or 24V

● XD6138 directly monitors



Directly monitors without dividing resistor

- High accuracy and dark current reduction
- Reduced number of external components
= reduced failure rate, space saving

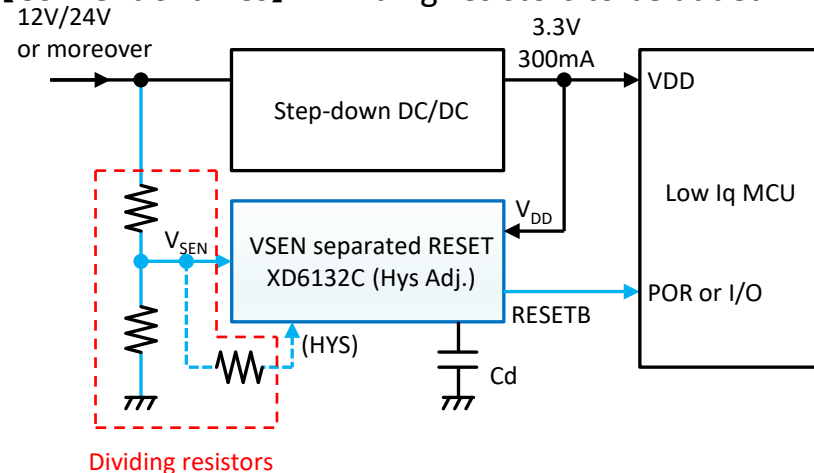
Wider hysteresis

- Suitable for Power supply lines with large voltage fluctuations
- An abundant voltage lineup
(Standard voltage combination)

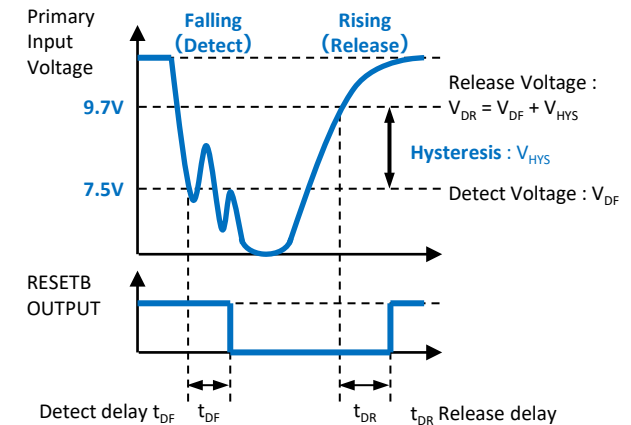
Detect / Release delay and manual reset function

- Adjustable with an external capacitor to the Cd pin

【Conventional ICs】 Dividing resistors to be added



12V input monitoring



Detect: Avoid resetting due to voltage fluctuations and ensure the required operating voltage
Release: Wait for a rise to the voltage required for operation

List of function combinations for standard part numbers

Supposed monitored line	Product Number	Output Configuration	Output Logic	Delay Time Ratio ^{※1} (Release : Detect)	Detect Voltage	Release Voltage	Hysteresis
USB / 5V	XD6138CF25	CMOS output	Active Low	1 : 1.000	3.5V	4.0V	14.3%
	XD6138BA37		Active High	1 : 0.000	4.0V	4.2V	5.0%
	XD6138NA37	Nch open drain	Active Low				
12V	XD6138CAR5	CMOS output	Active Low	1 : 0.000	5.0V	7.5V	50.0% ^{※2}
	XD6138NA5V	Nch open drain			5.0V	5.4V	8.0%
	XD6138NATU				5.2V	7.0V	34.6% ^{※2}
	XD6138BAR8	CMOS output			Active High	5.5V	8.2V
	XD6138NF7U	Nch open drain	Active Low	1 : 1.000	5.6V	6.3V	12.5%
	XD6138NA96			1 : 0.000	6.0V	6.5V	8.3%
	XD6138ND9G			1 : 0.250	6.0V	7.5V	25.0% ^{※2}
	XD6138CCCG	CMOS output		1 : 0.125	6.8V	8.5V	25.0% ^{※2}
	XD6138NAE7	Nch open drain		1 : 0.000	7.3V	7.8V	6.8%
	XD6138NARJ			1 : 0.125	7.5V	9.7V	29.3% ^{※2}
	XD6138NCRJ						
	XD6138CARJ	CMOS output	1 : 0.000	8.7V	9.2V	5.7%	
	XD6138CCRJ	1 : 0.125					
	XD6138NAL6	Nch open drain	1 : 0.000	9.5V	10.0V	5.3%	
	XD6138NAN0		1 : 0.000				
	XD6138CAN0	CMOS output	1 : 0.000	10.0V	10.5V	5.0%	
XD6138NANL	Nch open drain	1 : 0.000	10.0V	10.5V	5.0%		
24V	XD6138NFPO	Nch open drain	Active Low	1 : 1.000	12.0V	13.0V	8.3%
	XD6138NASY			1 : 0.000	15.5V	20.0V	29.0% ^{※2}
	XD6138NAQE				17.5V	18.5V	5.7%
	XD6138NAQT				19.0V	20.0V	5.3%

※1 This product provides a release/detect delay with a single external capacitance on Cd pin.
The ratio shown is the ratio of release : detection delay time, and 0 means no delay.

※2 Part numbers with wide hysteresis are suitable when voltage fluctuations are large.