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The technical content of this austriamicrosystems datasheet is still valid.


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# AS3635

## Xenon Flash Driver with 5V IGBT Control

## 1 General Description

The AS3635 is a highly integrated photoflash charger with build in IGBT driver.

A build in 5V charge-pump guaranties constant IGBT drive at any battery voltage. The build in timer turns off the charge-pump 20 seconds after charging.

In circuit fuse trimming allows to set the voltage on the photoflash capacitor to ±3% accuracy.

The AS3635 is available in a space-saving WL-CSP package measuring only 1.5mm x 1.5mm and operates over the -30ºC to +85ºC temperature range.

## 2 Key Features

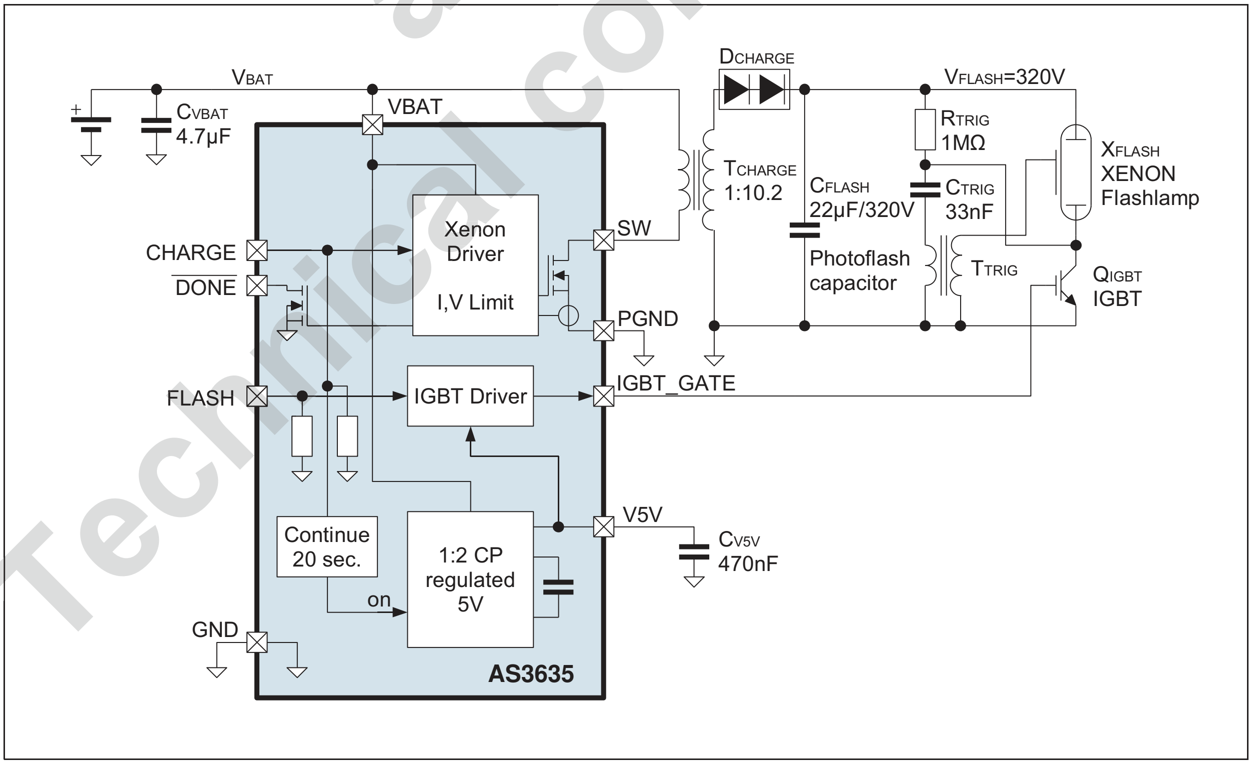
- Build in 5V charge-pump for IGBT gate drive
- Photoflash voltage accuracy programmable to ±3% (in circuit One Time Programmable - OTP)
- Trip voltage accuracy ±1.5%
- Small Size 1.5mm x 1.5mm x 0.6mm
- PCB: No microvias need
- Average input current < 320mA
- Few external components
  - No Schottky-Diode needed
  - No output voltage divider needed
- Reliable Flash on/off for IGBT timing.
- Charge time < 4sec @ Vbat>2.7V, $C_{FLASH}$ =22µF
- Charge complete indicator
- Undervoltage lockout
- Available in a tiny WL-CSP Package
  3x3 balls 0.5mm pitch, 1.5x1.5mm package size

## 3 Applications

Xenon Flash driver for mobile phones, PDA and DSC

**Warning:** Lethal voltages are present on applications using AS3635! Do not operate without training to handle high voltages.

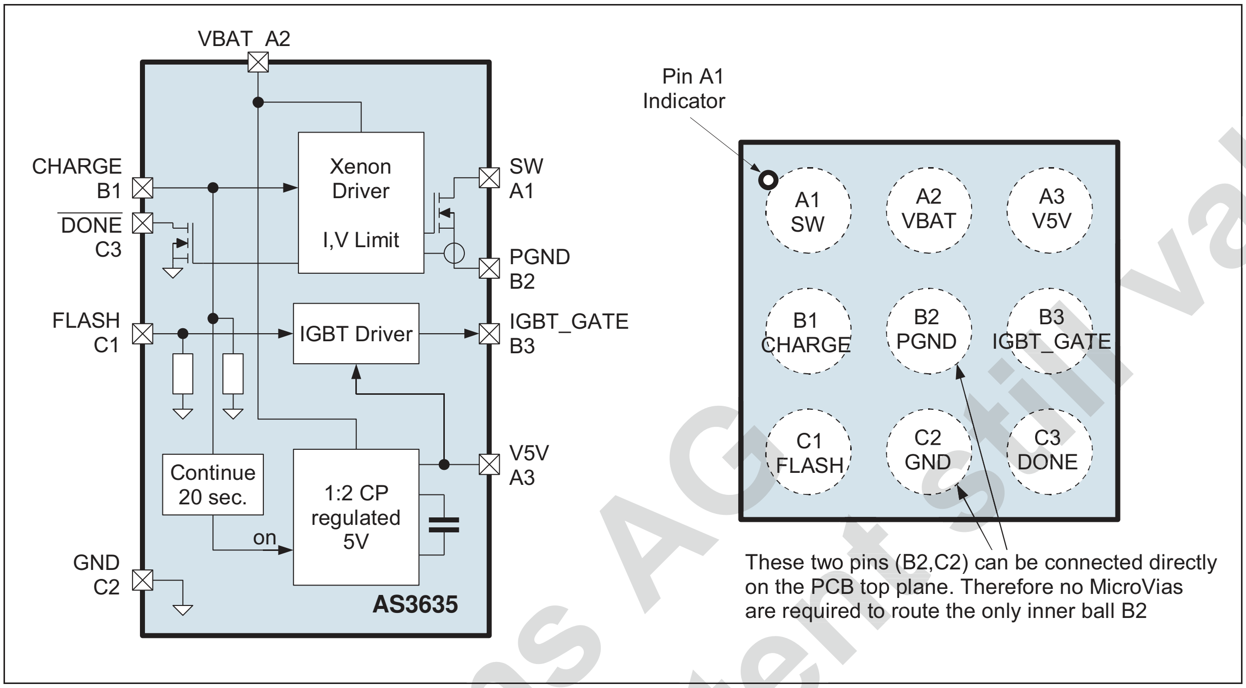
*Figure 1. Typical Operating Circuit*



# 4 Pinout

## Pin Assignment

*Figure 2. Pin Assignments (Top Through View)*




## Pin Description

*Table 1. Pin Description for AS3635*

| Pin Number | Pin Name | Description |
|---|---|---|
| A1 | SW | Xenon DCDC converter switching node |
| A2 | VBAT | Positive supply voltage input |
| A3 | V5V | 5V charge pump output |
| B1 | CHARGE | Digital input pin, active high - enables charging of photoflash capacitor |
| B2 | PGND | Power ground - connect to ground (GND) |
| B3 | IGBT_GATE | IGBT gate control - internally level shifted to 5V (from pin V5V) |
| C1 | FLASH | Digital input pin, active high - Enables flash (level shifted to IGBT_GATE) |
| C2 | GND | Signal ground - connect to ground (GND) |
| C3 | $\overline{\text{DONE}}$ | Digital open drain output, active low - indicates end of charging |

# 5 Absolute Maximum Ratings

Stresses beyond those listed in Table 2 may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in Table 3, “Electrical Characteristics,” on page 4 is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

*Table 2. Absolute Maximum Ratings*

| Parameter | Min | Max | Units | Comments |
|---|---|---|---|---|
| VBAT, V5V to GND | -0.3 | +7.0 | V | |
| CHARGE, $\overline{\text{DONE}}$, FLASH to GND | -0.3 | VBAT + 0.3 | V | maximum 7.0V |
| IGBT_GATE to GND | -0.3 | V5V + 0.3 | V | |
| SW to PGND | -0.3 | +55.0 | V | |
| PGND to GND | 0.0 | 0.0 | V | Connect PGND to GND directly below the pad (short connection recommended) |
| Input Pin Current without causing latchup | -100 | +100 $+I_{IN}$ | mA | Norm: EIA/JESD78 |
| **Continuous Power Dissipation ($T_A$ = +70ºC)** | | | | |
| Continuous power dissipation | | 0.76 | W | $P_T$[1] |
| **Electrostatic Discharge** | | | | |
| ESD pins VBAT, CHARGE, $\overline{\text{DONE}}$, FLASH[2] | | ±15000 | V | Air Discharge to module; IEC 61000 -4 -2 test bench |
| | | ±8000 | V | Contact Test to module; IEC 61000 -4 -2 test bench |
| ESD HBM pins SW, IGBT_GATE, PGND, V5V | | ±2000 | V | Norm: MIL 883 E Method 3015 |
| ESD CDM | | ±500 | V | Norm: JEDEC JESD 22-C101C |
| ESD MM | | ±100 | V | Norm: JEDEC JESD 22-A115-A level A |
| **Temperature Ranges and Storage Conditions** | | | | |
| Storage Temperature Range | -55 | +125 | ºC | |
| Humidity | 5 | 85 | % | Non condensing |
| Body Temperature during Soldering | | +260 | ºC | according to IPC/JEDEC J-STD-020 |
| Moisture Sensitivity Level (MSL) | MSL 1 | | | Represents a max. floor life time of unlimited |

1. Depending on actual PCB layout and PCB used
2. Assembled on PCB board (requires capacitor $C_{VBAT}$); special PCB layout (spark gaps) and external resistors required; system test for completed module (fully capsuled), no permanent interruption of operation

# 6 Electrical Characteristics

$V_{VBAT}$ = +2.51V to +5.5V, $T_{AMB}$ = -30ºC to +85ºC, unless otherwise specified. Typical values are at $V_{VBAT}$ = +3.6V, $T_{AMB}$ = +25ºC, unless otherwise specified.

*Table 3. Electrical Characteristics*

| Symbol | Parameter | Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **General Operating Conditions** | | | | | | |
| $V_{VBAT}$ | Supply Voltage | | 2.51[1] | 3.6 | 5.5 | V |
| $T_{AMB}$ | Operating Temperature | | -30 | 25 | 85 | ºC |
| $I_{SHUTDOWN}$ | Shutdown Current | CHARGE = 0, charge pump OFF, FLASH = 0 $T_{AMB}$<50ºC; $V_{VBAT}$<3.7V | | 0.5 | 1.0 | µA |
| $V_{UVLO}$ | Undervoltage Lockout | Measured on pin VBAT | 2.3 | | 2.5 | V |
| **$V_{FLASH}$ Capacitor Charger** | | | | | | |
| $V_{TRIP}$ | Comparator trip voltage | V(SW) - V(VBAT) in circuit adjustable with OTP. $T_{AMB}$ = 0°C to 50°C; only if $V_{TRIP}$ is trimmed by austriamicrosystems | 31.9 | 32.4 | 32.9 | V |
| $V_{TRIPRANGE}$ | Programming range of $V_{TRIP}$ | 5 bit programming 32.4V -11.2%/+10.5%; measured on pin SW Allows in-circuit trimming of the final charged voltage $V_{FLASH}$ on capacitor $C_{FLASH}$ | 29.6 | | 35.8 | V |
| $V_{SW}$ | Maximum voltage on pin SW | | | | 50 | V |
| $I_{SW}$ | Switching current limit | | 0.75 | 0.9 | 1.05 | A |
| $R_{SW}$ | Switch on resistance | Internal transistor between SW and PGND | | 0.4 | | Ω |
| $t_{EOC\_DET}$ | | end of charge comparator trigger time - see Internal Circuit on page 8 | 128 | 138 | 148 | ns |
| **Charge Pump Parameters** | | | | | | |
| $V_{V5V}$ | 5V Charge pump output voltage | 5.25 > $V_{VBAT}$ > 2.7V | 4.75 | 5.0 | 5.25 | V |
| | | 2.7V > $V_{VBAT}$ > 2.51V | 4.3 | | 5.25 | |
| $I_{CHRG\_PUMP}$ | Charge Pump Operating Current | CHARGE= 0->1->0 (20 seconds timer running[2]), charge pump ON includes 48µA for internal biasing and oscillator | | 163 | | µA |
| $f_{CLK}$ | Operating frequency | | | 2.0 | | MHz |
| **IGBT Control -** **See IGBT Driver on page 13** | | | | | | |
| $IBGT_{RISE}$ | IGBT control voltage rise time | Pin IGBT_GATE, rise/falltime 10% - 90%, V5V=5V, $T_{AMB}$=25ºC, VIN=3.7V, AS3635E, load: 6.5nF (capacitor) | 0.171 | 0.214 | 0.256 | µs |
| $IBGT_{FALL}$ | IGBT control voltage fall time | | 0.42 | 0.525 | 0.63 | µs |
| $R_{IGBT\_ON}$ | IGBT switching on resistance | $T_{AMB}$=-30ºC to 85ºC; AS3635B | 30 | 50 | 60 | Ω |
| | | $T_{AMB}$=-30ºC to 85ºC; AS3635E | 5 | 15 | 20 | Ω |
| $I_{IGBT\_SINK}$ | IGBT Sink Current | $V_{IGBT\_GATE}$ below 2.3V; $T_{AMB}$=-30ºC to 85ºC; AS3635B | 10 | 15 | 20 | mA |
| | | $V_{IGBT\_GATE}$ below 2.3V; $T_{AMB}$=-30ºC to 85ºC; AS3635E | 52 | 60 | 70 | mA |
| $I_{IGBT\_BOOST}$ | IGBT Boost Current | $V_{IGBT\_GATE}$ above 2.3V; $T_{AMB}$=-30ºC to 85ºC | 40 | 46 | 53 | mA |
| **Digital Interface** | | | | | | |

*Table 3. Electrical Characteristics (Continued)*

| Symbol | Parameter | Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| $V_{IH}$ | High Level Input Voltage | Pins CHARGE, FLASH; pin $\overline{DONE}$ in trimmode | 1.26 | | | V |
| $V_{IL}$ | Low Level Input Voltage | Pins CHARGE, FLASH; pin $\overline{DONE}$ in trimmode | 0.0 | | 0.54 | V |
| $V_{OL}$ | Low Level Output Voltage | Pin $\overline{DONE}$, $I_{LOAD}$=4mA | | | 0.2 | V |
| $I_{LEAK}$ | Leakage current | Pin $\overline{DONE}$ | -1 | | +1 | µA |
| $R_{PD}$ | Pulldown resistance to GND[3] | Pins CHARGE, FLASH | | 52 | | kΩ |
| **Recommended Transformer parameters - see Table 4, "Recommended Transformers," on page 15** | | | | | | |
| $L_{PRIMARY}$ | Primary Inductance | | 6 | | | µH |
| $L_{LEAK}$ | Primary Leakage Inductance | | | | 0.4 | µH |
| N | Turns Ratio | for $V_{FLASH}$=320V (final charged voltage on $C_{FLASH}$) | | 10.2 | | |
| $V_{ISOLATION}$ | Isolation Voltage | | 500 | | | V |
| $I_{SATURATION}$ | Primary Saturation Current | | 0.84 | | | A |
| $R_{PRIMARY}$ | Primary Winding Resistance | | | | 0.4 | Ω |
| $R_{SECUNDARY}$ | Secondary Winding Resistance | | | | 60 | Ω |

1. Minimum $V_{VBAT}$ is set to 2.51V to allow a little margin to maximum $V_{UVLO}$ undervoltage lockout of 2.5V.
2. Setting CHARGE=1 resets the timeout timer. Additionally the timeout timer is automatically stopped at power on reset and once it has expired.
3. Measured with VBAT=3.7V, CHARGE or FLASH = 1.26V

# 7 Typical Operating Characteristics

VBAT = 3.6V, $T_A$ = +25ºC (unless otherwise specified). $C_{FLASH}$=22µF, $T_{CHARGE}$ Transformer = TTRN-3822, $Q_{IGBT}$=RJP4002ANS, $I_{SW}$=750mA.

*Figure 3. Charging Waveform*

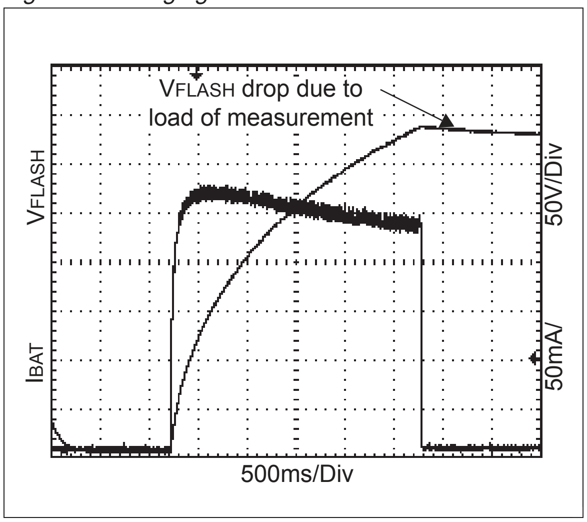



*Figure 4. Charging Time vs. VBAT*

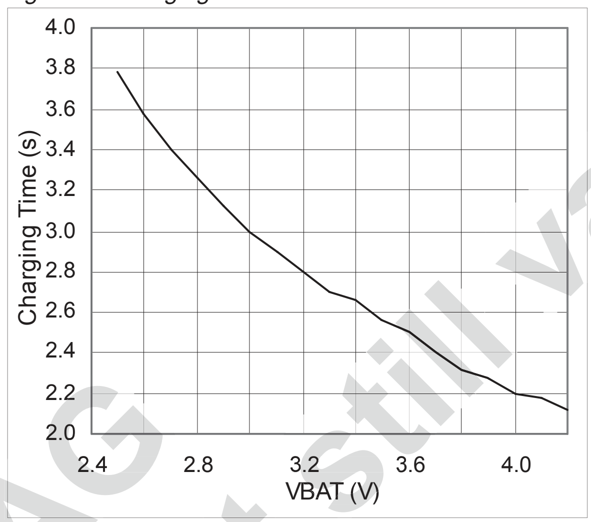



*Figure 5. Charging Waveform VBAT=2.51V*

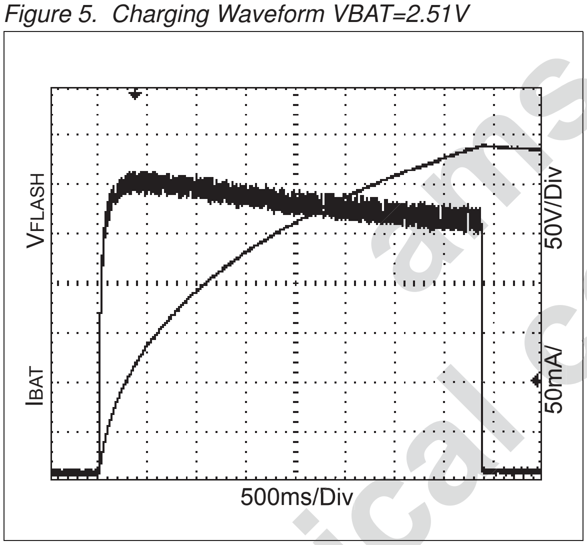



*Figure 6. Charging Waveform VBAT=4.2V*

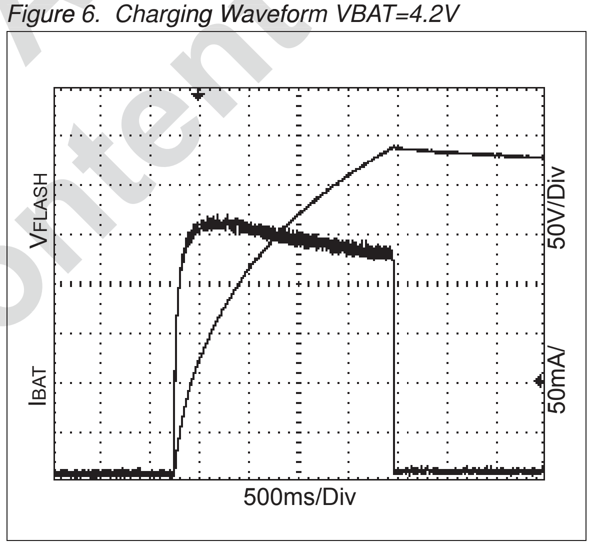



*Figure 7. Efficiency vs. $V_{FLASH}$*

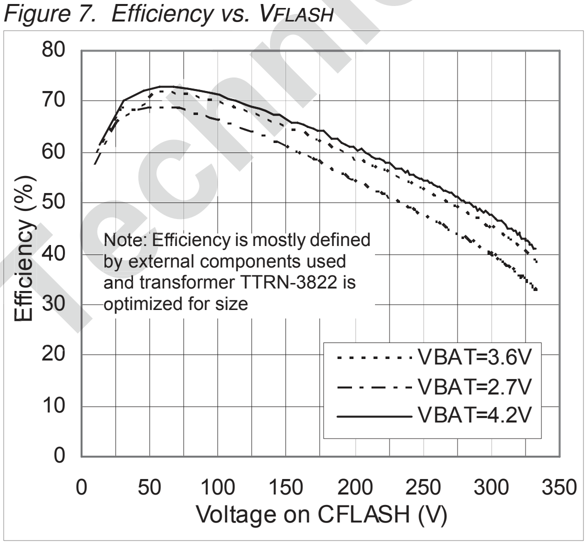



*Figure 8. Efficiency vs. Charging Time*

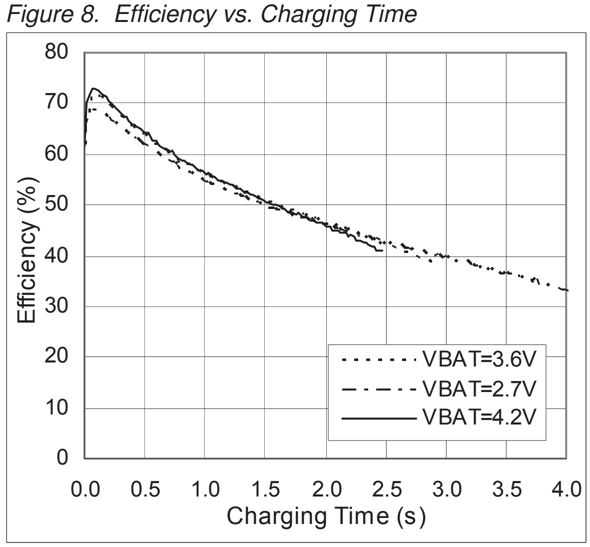


*Figure 9. End of charge Voltage vs. VBAT*

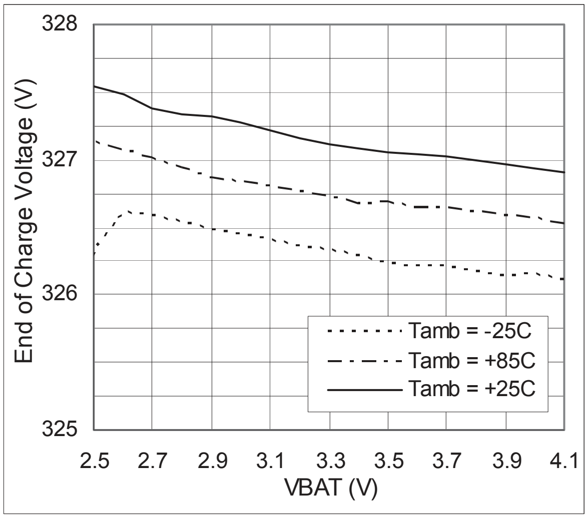



*Figure 10. IGBT_GATE driving waveform*

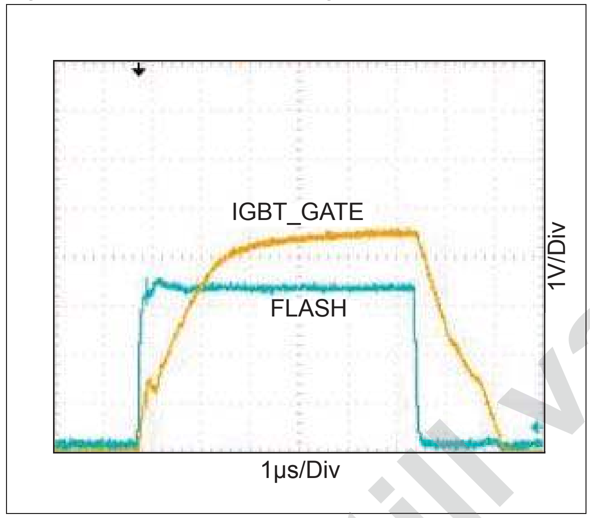



*Figure 11. SW switching waveform*

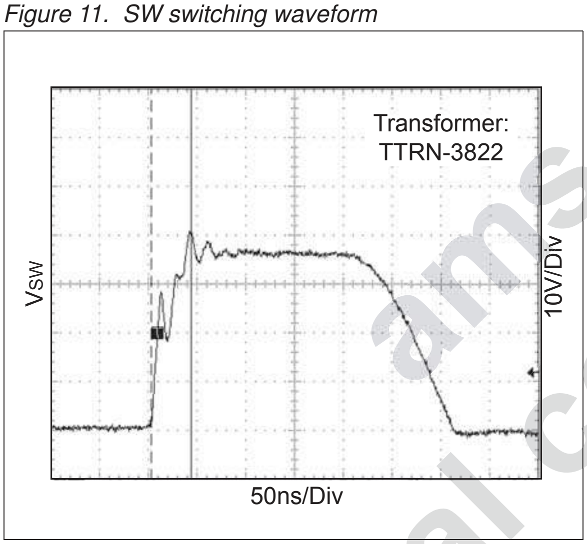



*Figure 12. SW switching waveform*

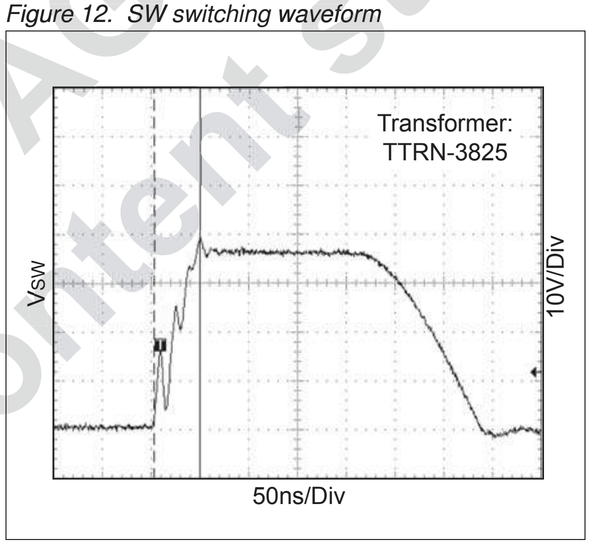



*Figure 13. V5V vs. VBAT (V5V CP on)*

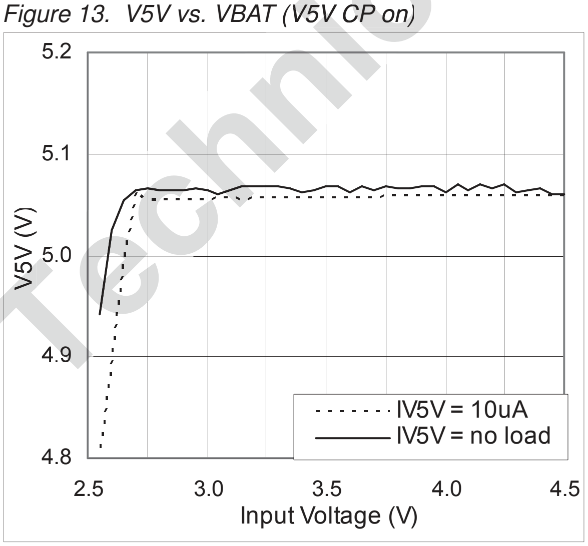
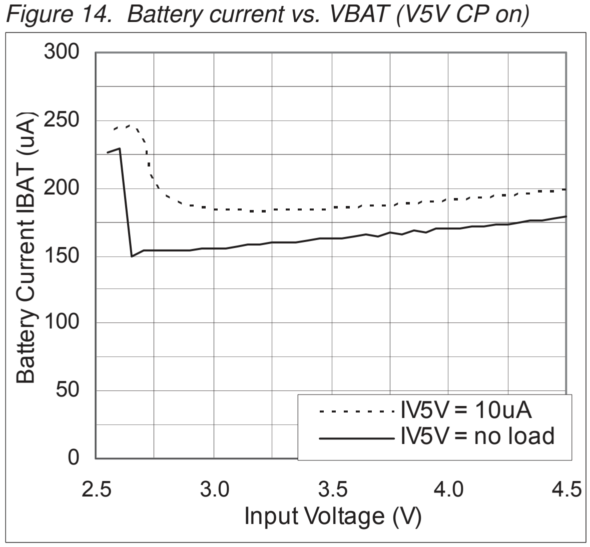



*Figure 14. Battery current vs. VBAT (V5V CP on)*



# 8 Detailed Description

The AS3635 is a photoflash capacitor charger and an integrated IGBT driver for a Xenon flash. The capacitor charger charges $V_{FLASH}$ to the final charging voltage (e.g. 320V) and the IGBT driver starts the actual Xenon flash.

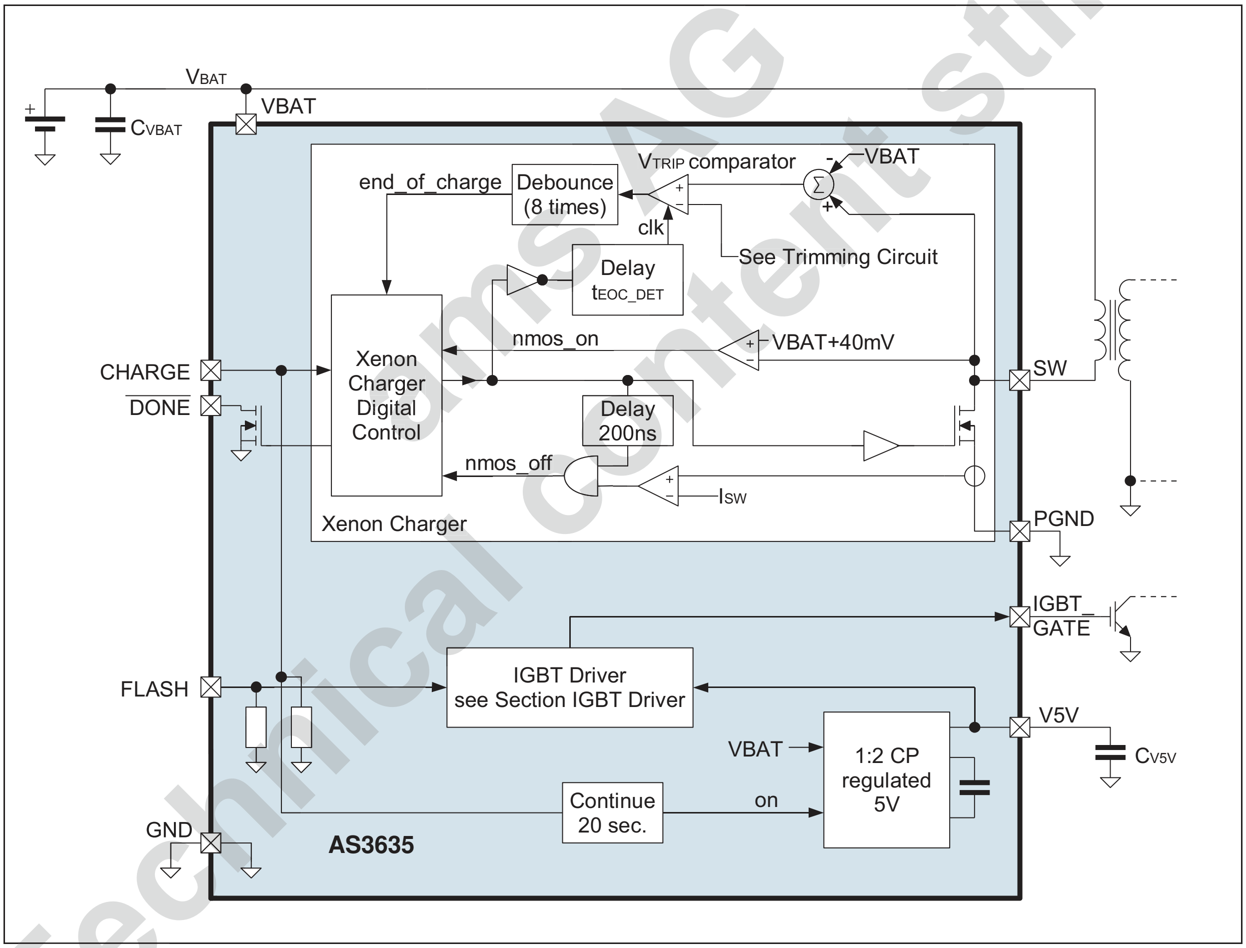
Additionally a charge pump is included to generate a stable 5V supply for accurate control of the IGBT on/off timings independent of the battery supply.

The final charged voltage ($V_{FLASH}$) can be in-field trimmed to e.g. 320V with the integrated OTP (one time programmable) memory (see section Trimming Procedure on page 12). $V_{FLASH}$ can be exactly trimmed to the maximum allowed output voltage resulting in an improved use of the available energy in the photoflash capacitor.

**Note:** The AS3635 uses a WL-CSP (wafer level chip scale package) to optimize the PCB area required and minimize the module size. Therefore the actual DIE is visible (and it is not molded in plastic as for other packages like QFN or DFN) and the AS3635 is sensitive to external light. It has to be protected from direct light from the Xenon tube.

## Internal Circuit

*Figure 15. Internal circuit*






## AS3635 Operation

The AS3635 allows charging and refresh cycles under complete software control. Two typical configurations are shown in Figure 16 and Figure 17:

Figure 16 shows a configuration without any refresh between the pre-flash and the actual flash. Typically this is used for applications where no noise at all should be generated on the battery when the camera is performing e.g. white color balancing (between pre-flash and flash cycle).

*Figure 16. AS3635 Charging Cycle without recharging between Pre-Flash and Flash*

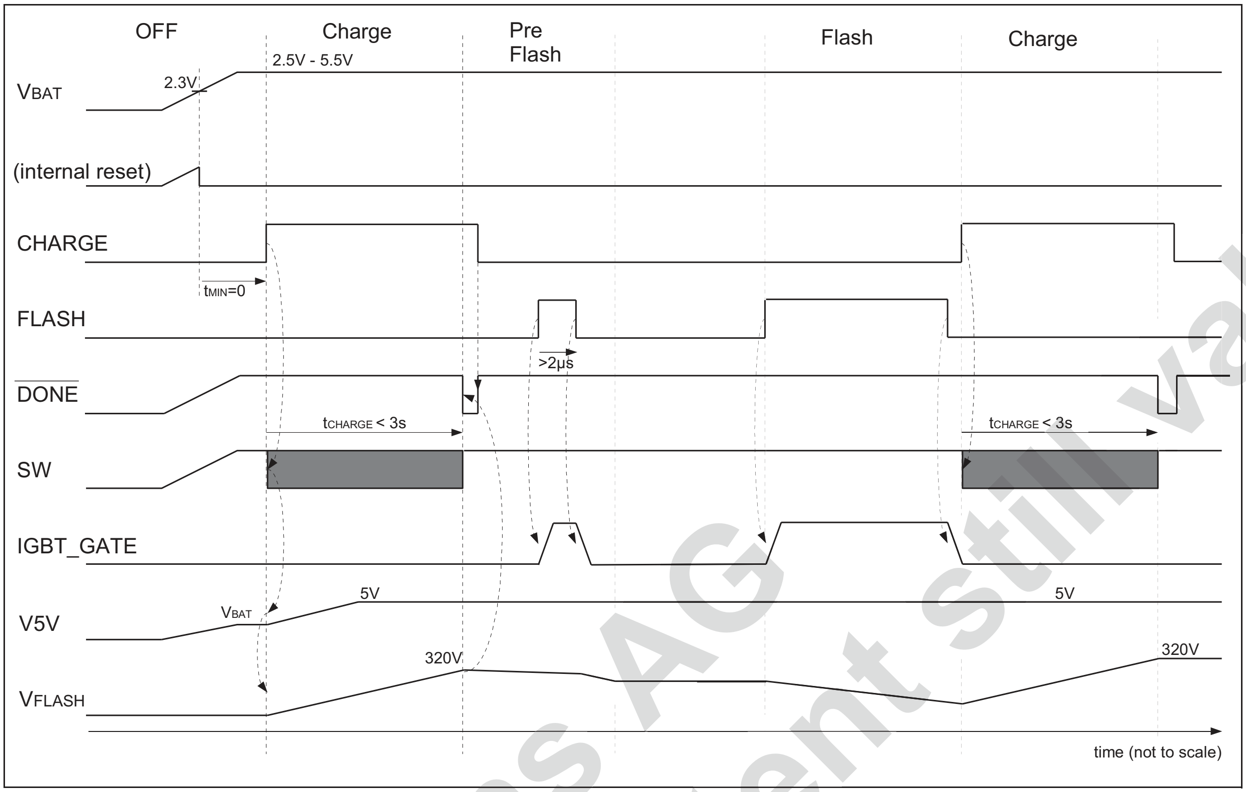
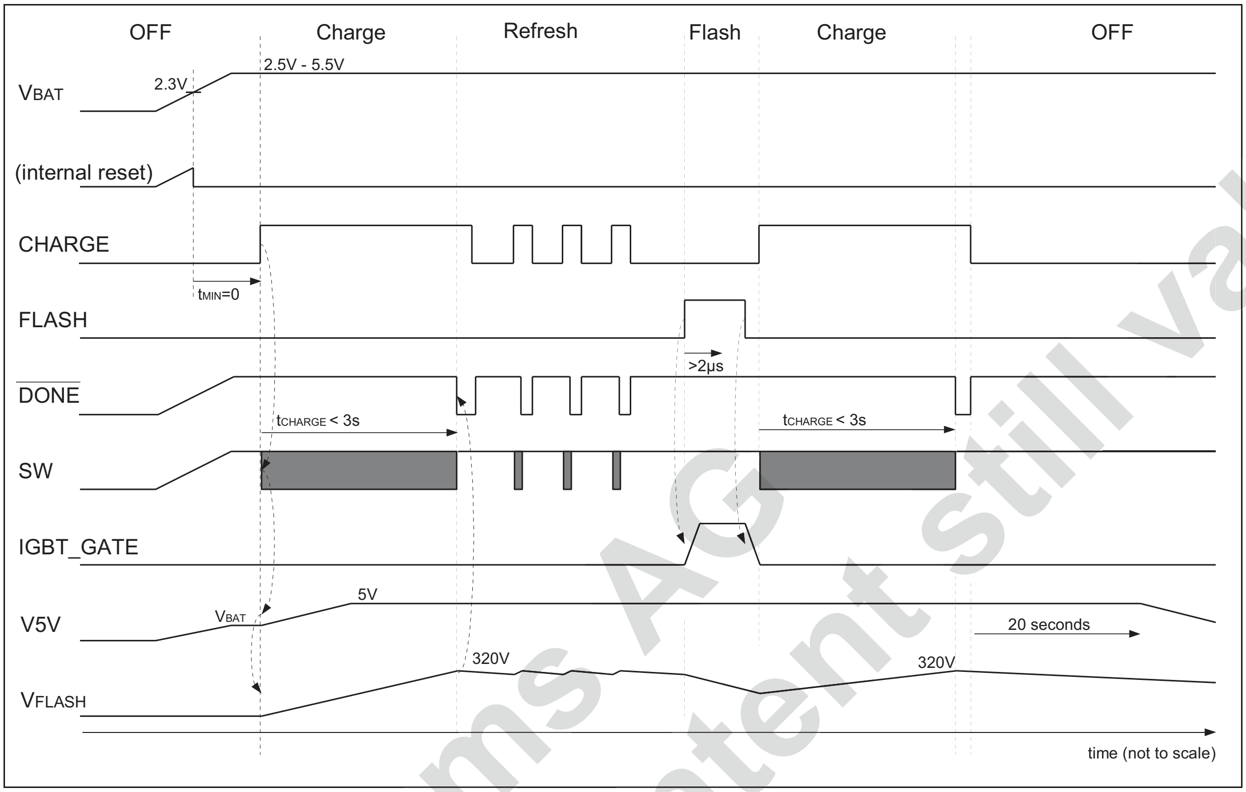


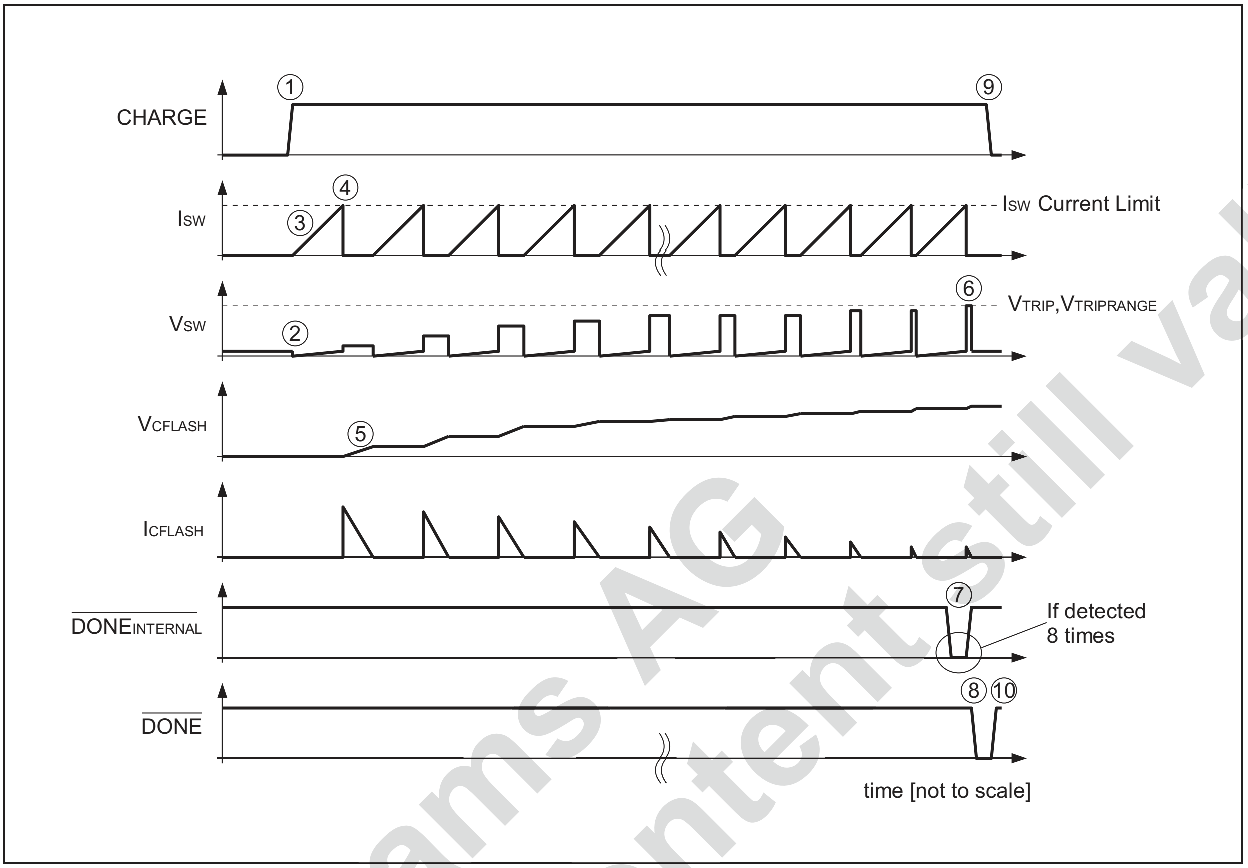
Figure 17 shows a configuration with continuous refresh of the voltage on the photoflash capacitor ($V_{FLASH}$). Typically this is used in application where the maximum flash energy should be used.

*Figure 17. AS3635 Charging Cycle with continuous recharging*



A typical charging cycle and its voltages and current on the different pins and signals are shown in Figure 18:

*Figure 18. AS3635 Charging Cycle Details*




The input CHARGE is set to high and charging begins (1).

During a single cycle, the internal NMOS transistor connects the pin SW to PGND (2). Therefore the current $I_{SW}$ rises (3) until it reaches $I_{SW}$ current limit (4). Then the energy is transferred to the secondary side of the transformer and the voltage $V_{CFLASH}$ on the flash capacitor $C_{FLASH}$ rises (5).

The output voltage $V_{CFLASH}$ gradually increases and once it hits the end of charge detection threshold (6) (detected on $V_{SW}$ during the off time of the NMOS transistor between SW and PGND) 8 times (7)[1], $\overline{DONE}$ is pulled low (8). When CHARGE is set to low afterwards (9), $\overline{DONE}$ returns to high (10) finishing a full charging cycle.

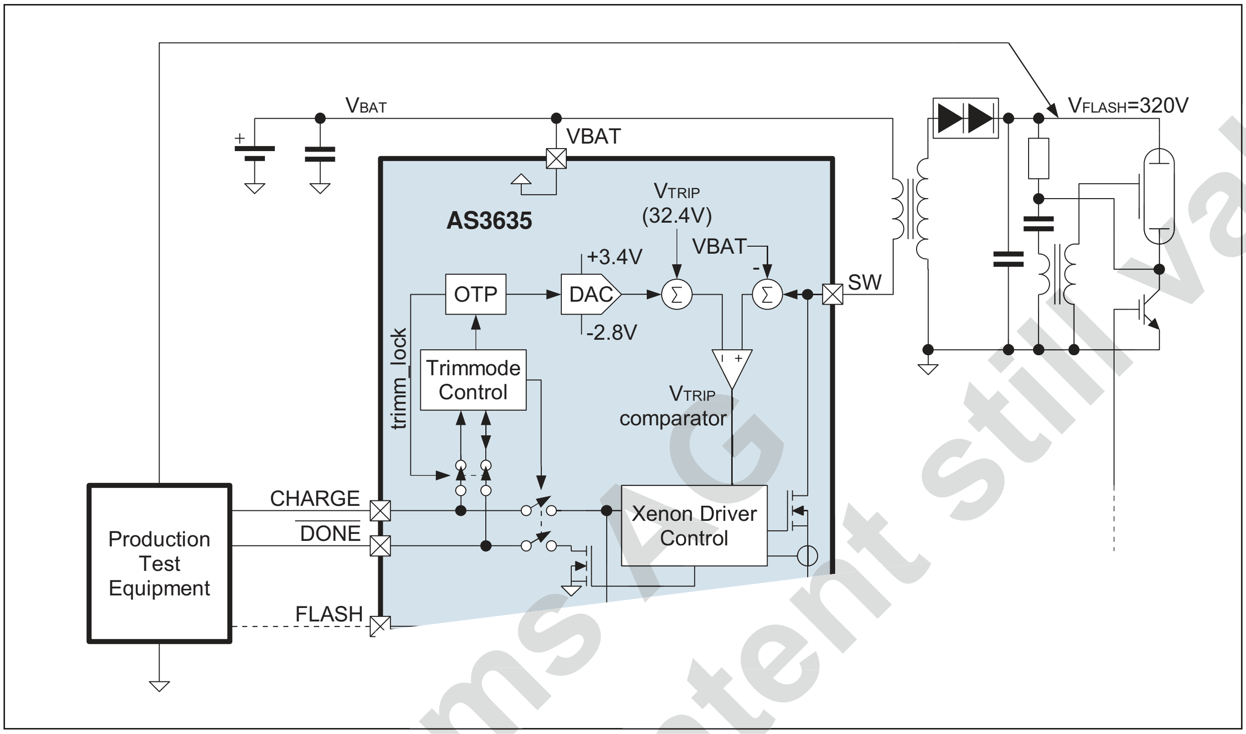
**Note:** For simplicity the number of actual charging cycles (NMOS SW on/off) are reduced in Figure 18.

1. The 8 cycles required for actual detection of the end of charge conditions are not shown in Figure 18.

## Trimming Procedure

The final charging voltage on VFLASH can be trimmed in-circuit to cancel inaccuracies of VFLASH due to the transformer and diode. The trimming procedure is performed as follows:

*Figure 19. AS3635 trimming circuit*[2]




1. The production test equipment starts a charging cycle (CHARGE=1) and waits until $\overline{\text{DONE}}$=0
2. The voltage on VFLASH is measured and a correction code is calculated
3. The trimmode control is unlocked using a special sequence
4. The one time programmable memory (OTP) is programmed with the above calculated code
5. The trimmode control can be disabled by fusing the OTP bit trimm_lock

See austriamicrosystems application note 'AN3635_In-Production_Trimming' for a detailed description of the trimming setup and the trimming procedure.

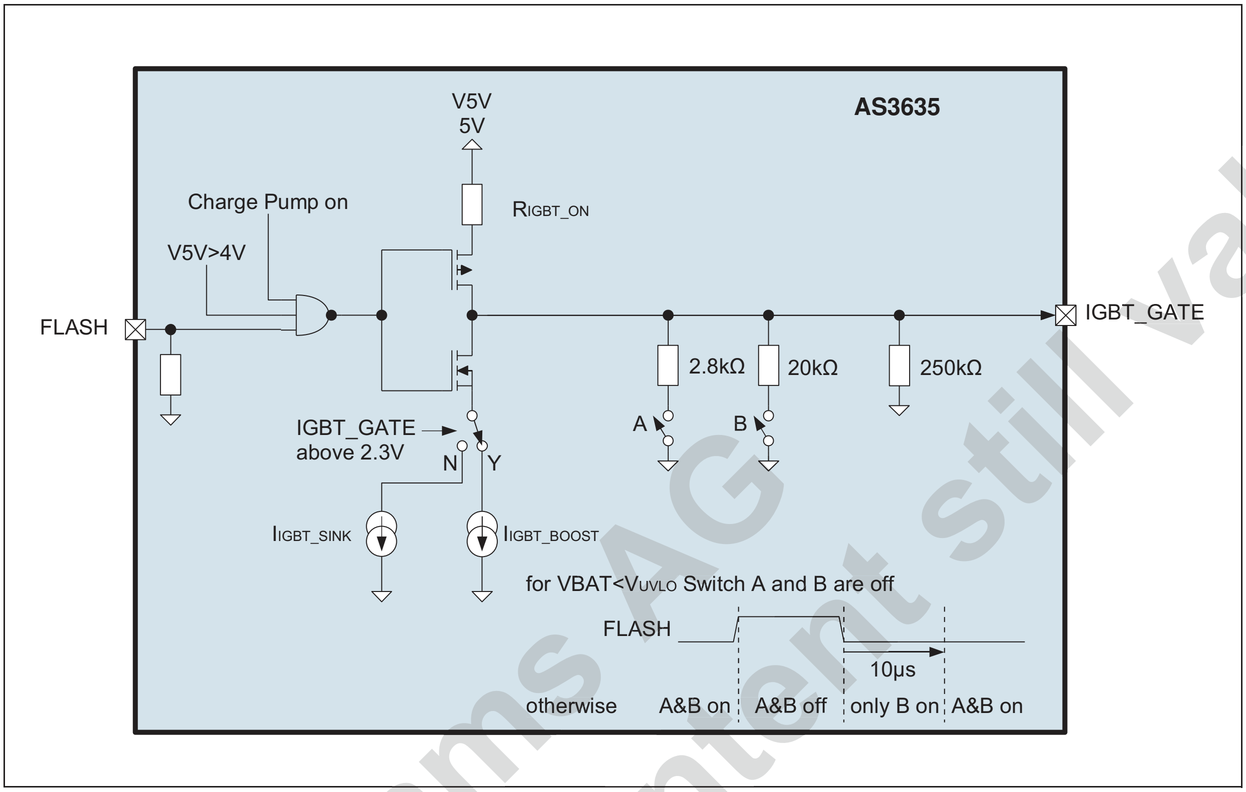


2. The internal voltages (e.g. +3.4V/-2.8V/32.4V) are internally scaled to fit in the supply voltage range

## IGBT Driver

The internal circuit of the IGBT driver is shown in Figure 20:

*Figure 20. IGBT Driver circuit*






The IGBT driver is enable once the charge pump is switched on and the voltage on pin V5V has reached 4V (to guarantee at least 4V driving signal for the IGBT).

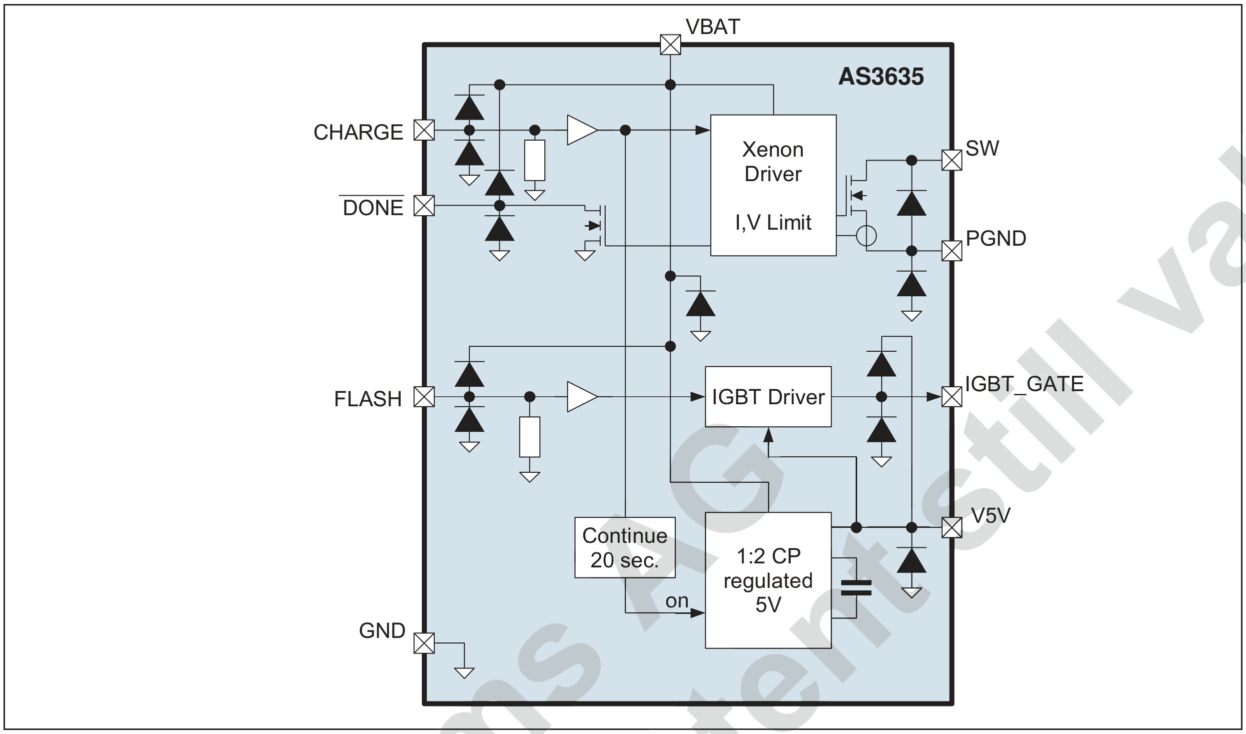
The IGBT driver includes all required resistors and pulldowns to operate the IGBT without any external circuitry[3]. Do not add any external pulldown resistor on pin IGBT_GATE.

3. Exception: If the Sanyo IGBT TIG058E8 is used, add a series resistor of 50Ω for the gate drive. For Renesas RJP4006AGE add a series resistor of 68Ω.

## ESD Protection Diodes

The internal ESD diodes are shown in Figure 21 - do not operate ESD diodes in forward direction[4]:

*Figure 21. ESD Diodes*






4. Exception: The diode between SW and PGND is designed to be operated in forward direction for very short pulses during charging.

# 9 Application Information

## External Components

### Transformers $T_{CHARGE}$ and $T_{TRIG}$

Following transformers are recommend for the AS3635 (due to the OTP programming features see section Trimming Procedure on page 12, the output voltage $V_{FLASH}$ can be programmed):

*Table 4. Recommended Transformers*

| Component | Part Number | N | L | Size (mm) | Manufacturer |
|---|---|---|---|---|---|
| $T_{CHARGE}$ | C3-T2.5R | 10.2 | 6.7µH | 3.4x3.4x2.5 | Mitsumi Electric www.mitsumi.co.jp |
| | TTRN-3825H | 10.2 | 7µH | 3.8x3.8x2.5 | Tokyo Coil www.tokyo-coil.co.jp |
| | TTRN-3822H | 10.2 | 7µH | 3.8x3.8x2.2 | |
| | TTRN-5820H | 10.2 | 8.87µH | 5.8x5.8x2.0 | |
| | TTRN-0520H | 10.41 | 8.35µH | 5.0x5.0x2.0 | |
| | LDT4520T-01 | 10.2 | 10µH | 4.7x4.5x2.0 | TDK www.tdk.com |
| | ATB322515 | 10.2 | 7µH | 3.2x2.5x1.55 (H is max) | |
| $T_{TRIG}$ | BO-02 | | | 7.3x2.5(3.5)x2.2 | Tokyo Coil www.tokyo-coil.co.jp |

Always check if the voltage on the pin SW does never exceed the AS3635 maximum $V_{SW}$ (see Table 3 on page 4) specification during charging.

### IGBT

As the AS3635 has an internal charge pump included, 2.5V, 2.7V and 4V IGBT can be used without limit on the supply $V_{VBAT}$. The IGBT is used for two purposes:

1. Powering of the Xenon tube and generating together with the oscillation circuit consisting of $T_{TRIG}$, $C_{TRIG}$, $R_{TRIG}$ a sufficiently high trigger pulse to ignite the Xenon tube (about 3.5kV) - this is accomplished by a fast rising edge of the gate of the IGBT
2. Switching off the current through the Xenon tube at the end of the flash pulse to accurately control the light emitted by the flash. To protect the IGBT the switching off falling edge voltage should be less than 400V/µs (measured on the emitter of the IGBT)

Both requirements are achieved with the internal driving circuit of the AS3635. Internal OTP trimming allows to adopt to different trigger coils and IGBTs.

*Table 5. Recommended IGBTs*

| Component | Part Number | min. Drive Voltage | Size | Manufacturer |
|---|---|---|---|---|
| $Q_{IGBT}$ | RJP4002ANS | 2.5V | VSON-8 3 x 4.8mm | Renesas www.renesas.com |
| | RJP4003ANS | 4.0V | | |
| | RJP4006AGE[1] | 2.7V | 2.85x3.05x1.1 mm (H is max.) | |
| | GT8G133 | 4.0V | TSSOP-8 3.3 x 6.4mm | Toshiba www.semicon.toshiba.co.jp |
| | TIG058E8[2] | 4.0V | ECH8 2.8 x 2.9mm | Sanyo www.sanyo.com |

1. Add a series resistor of 68Ω in the gate drive.
2. Add a series resistor of 47Ω in the gate drive.

### Photoflash Capacitor $C_{FLASH}$

The photoflash capacitor stores the energy for the flash. Its capacitance define the maximum available energy. Using higher value capacitors as shown in Table 6 is possible, but will increase the charging time.

It is recommended to use low ESR capacitors to avoid loosing power during flash (it is also possible to connect two capacitors in parallel to reduce ESR):

*Table 6. Recommended Photoflash Capacitors*

| Component | Part Number | Capacitor | Voltage rating | Size | Manufacturer |
|---|---|---|---|---|---|
| $C_{FLASH}$ | 330FW13A6.3X20 | 2x13.5µF[1] | 330V | Cylinder<br>2 x l=24mm, d=7mm | Rubycon<br>www.rubycon.co.jp |

1. Different capacitor values are possible to be used together with the AS3635. Lower capacitor value will reduce charging time, lower ESR capacitor will improve light output energy and reduce losses in the capacitor during the flash pulse.

### Photoflash Charger rectification diode $D_{CHARGE}$

The rectification diode should have very low parasitic capacitance[5] and has to withstand the operating current and reverse voltages.

*Table 7. Recommended Rectification Diodes*

| Component | Part Number | Parasitic Capacitor | Voltage rating | Size | Manufacturer |
|---|---|---|---|---|---|
| $D_{CHARGE}$ | FVO2R80 | 5pF | 800V | 1.25x2.5mm | Origin<br>www.origin.co.jp |
| | GSD2004S | 5pF / 2 | 2x240V | SOT-23<br>2.4x3.0mm | Vishay<br>www.vishay.com |
| | BAS21 | 5pF / 2 | 2x250V | SC-70<br>2.0x2.1mm | OnSemi<br>www.onsemi.com |

### Supply Capacitor $C_{VBAT}$ and charge pump capacitor $C_{V5V}$

Low ESR capacitors should be used to minimize VBAT ripple. Multi-layer ceramic capacitors are recommended since they have extremely low ESR and are available in small footprints. The capacitor should be located as close to the device as possible.

X5R dielectric material is recommended due to their ability to maintain capacitance over wide voltage and temperature range.

*Table 8. Recommended $C_{VBAT}$ and $C_{V5V}$ Capacitor*

| Component | Part Number | C | TC Code | Rated Voltage | Size | Manufacturer |
|---|---|---|---|---|---|---|
| $C_{V5V}$ | GRM155R60J474 | 470nF | X5R | 6.3V | 0402 | Murata<br>www.murata.com |
| | GRM155R60J105<br>GRM155R61A105 | 1µF | X5R | 6.3V<br>10V | 0402 | |
| $C_{VBAT}$ | GRM188R60J475 | 4.7µF | X5R | 6.3V | 0603 | |

If a different output capacitor is chosen, ensure low ESR values and voltage ratings.

5. A low parasitic capacitance improves charging efficiency.

## PCB Layout Guideline

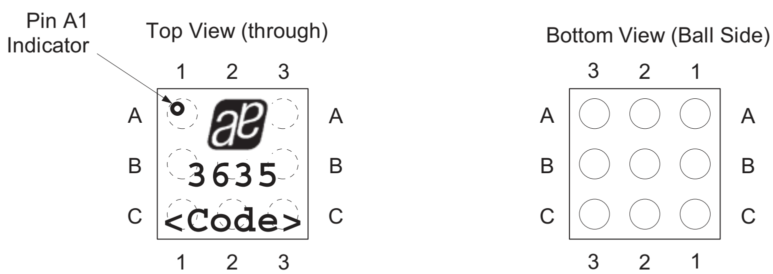
Following layout recommendations apply:

1. Keep the path (and area) of GND - $C_{VBAT}$ - VBAT - $T_{CHARGE}$(primary) - SW - GND as short as possible to minimize the leakage inductance of $T_{CHARGE}$ and ensure a proper supply connection for the AS3635
2. Place $C_{VBAT}$ as close as possible to the AS3635.
3. Ensure wide and short PCB paths for the path GND - $C_{FLASH}$ - $X_{FLASH}$ - $Q_{IGBT}$ - GND to allow 150A to flow during the flash pulse. Connect this GND only at a single place to the main GND plane.
4. The IGBT has two ground connections: One ground for the driving input and one ground for the power path.
5. Ensure larger spacings for all high voltage paths; check with the PCB manufacturer to ensure proper minimum spacing for 320V paths and 4kV (Xenon tube trigger pin) paths.
6. Minimize the parasitic capacitance of the PCB on the anode of $D_{CHARGE}$ especially to GND and $V_{FLASH}$
7. See austriamicrosystems “WLP-CSP-Handling-Guidelines_1V0.pdf” for proper handling, PCB layout and soldering of the WL-CSP AS3635 device.

See austriamicrosystems demoboard layout (described in application note ‘AN3635’).

# 10 Package Drawings and Markings

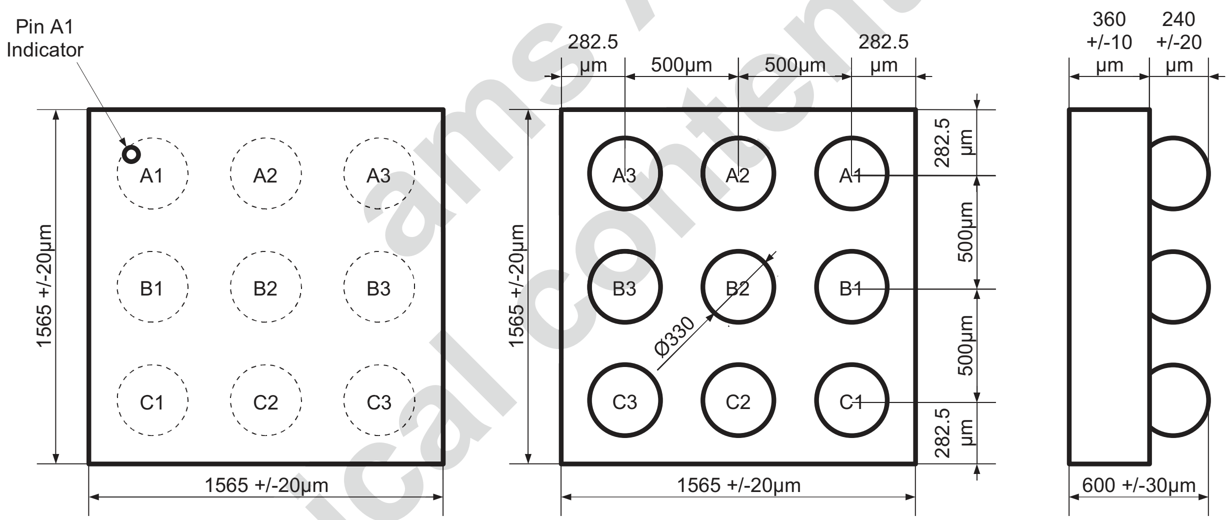
*Figure 22. 9 pin WL-CSP 1.5x1.5mm Marking*




**Note:**

Line 1: austriamicrosystems logo
Line 2: 3635 and version code (e.g. ‘A’ or ‘B’)
Line 3: <Code>
Encoded Datecode (4 characters)

*Figure 23. 9 pin WL-CSP 1.5x1.5mm Package Dimensions*



# 11 Ordering Information

The devices are available as the standard products shown in Table 9.

*Table 9. Ordering Information*

| Order Code | Marking | Description | Delivery Form | Package |
|---|---|---|---|---|
| AS3635B-ZWLT | 3635B | Xenon Flash Driver with 5V IGBT Control<br><br>$I_{SW}$ (charging current peak) = 900mA<br>$R_{IGBT\_ON}$ = 50Ω<br>$I_{IGBT\_SINK}$ = 15mA<br>$I_{IGBT\_BOOST}$ = 46mA<br>$V_{TRIP}$ trimmed by customer | Tape & Reel | 9-pin WL-CSP (1.5mm x 1.5mm) RoHS compliant / Green / Pb-Free |
| AS3635E-ZWLT | 3635E | Xenon Flash Driver with 5V IGBT Control<br><br>$I_{SW}$ (charging current peak) = 900mA<br>$R_{IGBT\_ON}$ = 15Ω<br>$I_{IGBT\_SINK}$ = 60mA<br>$I_{IGBT\_BOOST}$ = 46mA<br>$V_{TRIP}$ trimmed by customer | Tape & Reel | 9-pin WL-CSP (1.5mm x 1.5mm) RoHS compliant / Green / Pb-Free |

**Note:** All products are RoHS compliant and austriamicrosystems green.
Buy our products or get free samples online at ICdirect: http://www.austriamicrosystems.com/ICdirect

Technical support is found at http://www.austriamicrosystems.com/Technical-Support

For further information and requests, please contact us mailto:sales@austriamicrosystems.com
or find your local distributor at http://www.austriamicrosystems.com/distributor

**Note:** AS3635-ZWLT

AS3635-

B, E Version Code - see Table 9 - 'Description'
Z Temperature Range: -30ºC - 85ºC
WL Package: Wafer Level Chip Scale Package (WL-CSP) 1.5x1.5mm
T Delivery Form: Tape & Reel

## Copyrights



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