

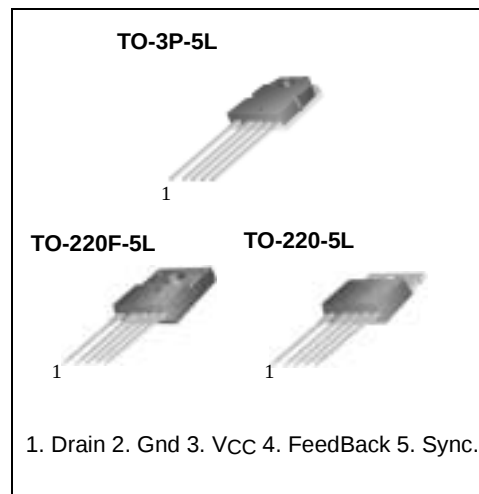
# KA5S-SERIES

## KA5S0765C/KA5S09654QT/KA5S0965/ KA5S12656/KA5S1265

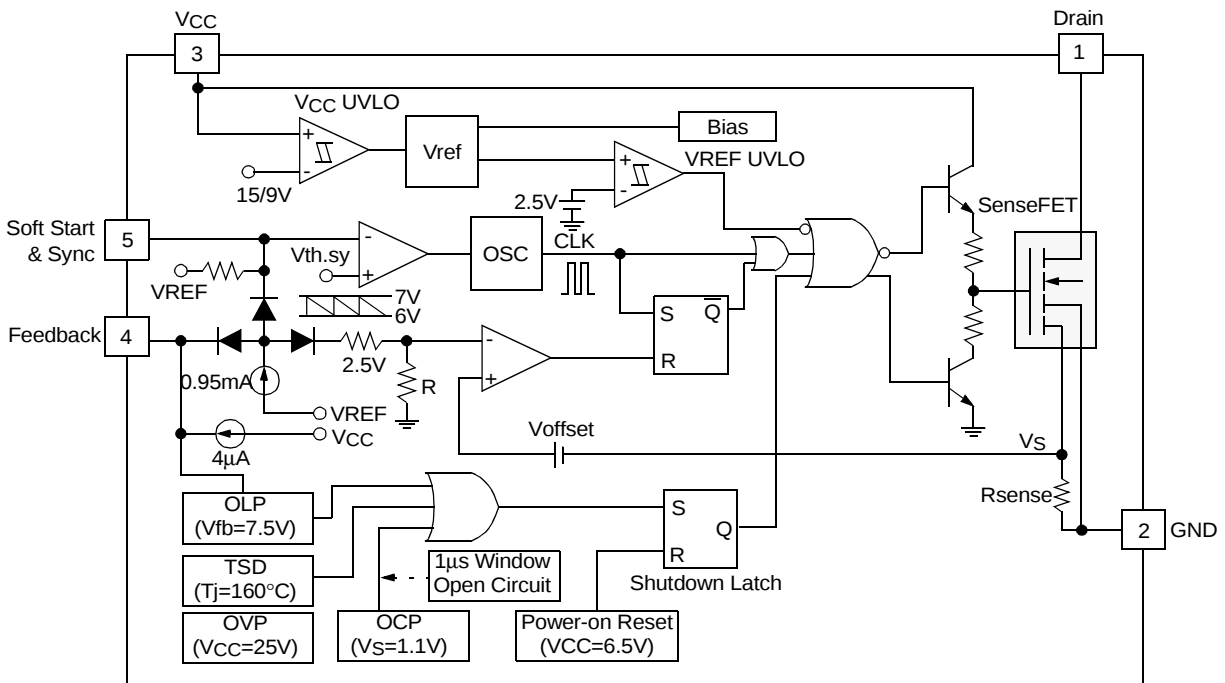
### Fairchild Power Switch(FPS)

#### Features

- Wide Operating Frequency Range Up to 150Khz
- Lowest Cost SMPS Solution
- Lowest External Components
- Low Start-up Current (max:170uA)
- Low Operating Current (max:12mA)
- Internal High Voltage SenseFET
- Over Voltage Protection With Latch Mode (Min23V)
- Over Load Protection With Latch Mode
- Over Current Protection With Latch Mode
- Internal Thermal Protection With Latch Mode
- Pulse By Pulse Over Current Limiting
- Under Voltage Lockout With Hysteresis
- External Sync. Terminal



#### Internal Block Diagram



## Absolute Maximum Ratings

(Ta=25°C, unless otherwise specified)

| Characteristic                                                         | Symbol                    | Value                   | Unit   |
|------------------------------------------------------------------------|---------------------------|-------------------------|--------|
| <b>KA5S0765C</b>                                                       |                           |                         |        |
| Maximum drain voltage                                                  | V <sub>D,MAX</sub>        | 650                     | V      |
| Drain-gate voltage(R <sub>GS</sub> =1MΩ)                               | V <sub>DGR</sub>          | 650                     | V      |
| Gate-source(GND) voltage                                               | V <sub>GS</sub>           | ±30                     | V      |
| Drain current pulsed <sup>(1)</sup>                                    | I <sub>DM</sub>           | 28                      | ADC    |
| Continuous drain current (T <sub>c</sub> = 25°C)                       | I <sub>D</sub>            | 7.0                     | ADC    |
| Continuous drain current (T <sub>c</sub> = 100°C)                      | I <sub>D</sub>            | 5.6                     | ADC    |
| Single pulsed avalanch current <sup>(3)</sup> (Energy <sup>(2)</sup> ) | I <sub>AS</sub> (EAS)     | 20(570)                 | A(mJ)  |
| Maximum supply voltage                                                 | V <sub>CC,MAX</sub>       | 30                      | V      |
| Input voltage range                                                    | V <sub>FB</sub>           | -0.3 to V <sub>CC</sub> | V      |
|                                                                        | V <sub>SS</sub>           | -0.3 to 8               | V      |
| Total power dissipation                                                | P <sub>D</sub> (Watt H/S) | 135                     | W      |
|                                                                        | Derating                  | 1.1                     | W / °C |
| Operating junction temperature.                                        | T <sub>J</sub>            | +160                    | °C     |
| Operating ambient temperature.                                         | T <sub>A</sub>            | -25 to +85              | °C     |
| Storage temperature range.                                             | T <sub>STG</sub>          | -55 to +150             | °C     |
| <b>KA5S09654QT</b>                                                     |                           |                         |        |
| Maximum drain voltage                                                  | V <sub>D,MAX</sub>        | 650                     | V      |
| Drain-gate voltage(R <sub>GS</sub> =1MΩ)                               | V <sub>DGR</sub>          | 650                     | V      |
| Gate-source(GND) voltage                                               | V <sub>GS</sub>           | ±30                     | V      |
| Drain current pulsed <sup>(1)</sup>                                    | I <sub>DM</sub>           | 49                      | ADC    |
| Continuous drain current (T <sub>c</sub> = 25°C)                       | I <sub>D</sub>            | 9.0                     | ADC    |
| Continuous drain current (T <sub>c</sub> = 100°C)                      | I <sub>D</sub>            | 5.7                     | ADC    |
| Single pulsed avalanch current <sup>(3)</sup> (Energy <sup>(2)</sup> ) | I <sub>AS</sub> (EAS)     | 25(660)                 | A(mJ)  |
| Maximum supply voltage                                                 | V <sub>CC,MAX</sub>       | 30                      | V      |
| Input voltage range                                                    | V <sub>FB</sub>           | -0.3 to V <sub>CC</sub> | V      |
|                                                                        | V <sub>SS</sub>           | -0.3 to 8               | V      |
| Total power dissipation                                                | P <sub>D</sub> (Watt H/S) | 160                     | W      |
|                                                                        | Derating                  | 1.28                    | W / °C |
| Operating junction temperature.                                        | T <sub>J</sub>            | +160                    | °C     |
| Operating ambient temperature.                                         | T <sub>A</sub>            | -25 to +85              | °C     |
| Storage temperature range.                                             | T <sub>STG</sub>          | -55 to +150             | °C     |

**Absolute Maximum Ratings (Continued)**

(Ta=25°C, unless otherwise specified)

| Characteristic                                                          | Symbol                             | Value                   | Unit   |
|-------------------------------------------------------------------------|------------------------------------|-------------------------|--------|
| <b>KA5S0965</b>                                                         |                                    |                         |        |
| Maximum Drain Voltage                                                   | V <sub>D,MAX</sub>                 | 650                     | V      |
| Drain-Gate Voltage(R <sub>GS</sub> =1MΩ)                                | V <sub>DGR</sub>                   | 650                     | V      |
| Gate-Source(GND) Voltage                                                | V <sub>GS</sub>                    | ±30                     | V      |
| Drain Current Pulsed <sup>(1)</sup>                                     | I <sub>DM</sub>                    | 36                      | ADC    |
| Continuous Drain Current (T <sub>c</sub> = 25°C)                        | I <sub>D</sub>                     | 9.0                     | ADC    |
| Continuous Drain Current (T <sub>c</sub> = 100°C)                       | I <sub>D</sub>                     | 5.8                     | ADC    |
| Single Pulsed Avalanche Current <sup>(3)</sup> (Energy <sup>(2)</sup> ) | I <sub>AS</sub> (E <sub>AS</sub> ) | 28(950)                 | A(mJ)  |
| Maximum Supply Voltage                                                  | V <sub>CC,MAX</sub>                | 30                      | V      |
| Input Voltage Range                                                     | V <sub>FB</sub>                    | -0.3 to V <sub>CC</sub> | V      |
|                                                                         | V <sub>SS</sub>                    | -0.3 to 8               | V      |
| Total Power Dissipation                                                 | P <sub>D</sub> (Watt H/S)          | 170                     | W      |
|                                                                         | Derating                           | 1.33                    | W / °C |
| Operating Junction Temperature.                                         | T <sub>J</sub>                     | +160                    | °C     |
| Operating Ambient Temperature.                                          | T <sub>A</sub>                     | -25 to +85              | °C     |
| Storage Temperature Range.                                              | T <sub>STG</sub>                   | -55 to +150             | °C     |
| <b>KA5S12656</b>                                                        |                                    |                         |        |
| Maximum Drain Voltage                                                   | V <sub>D,MAX</sub>                 | 650                     | V      |
| Drain-Gate Voltage(R <sub>GS</sub> =1MΩ)                                | V <sub>DGR</sub>                   | 650                     | V      |
| Gate-Source(GND) Voltage                                                | V <sub>GS</sub>                    | ±30                     | V      |
| Drain Current Pulsed <sup>(1)</sup>                                     | I <sub>DM</sub>                    | 48                      | ADC    |
| Continuous Drain Current (T <sub>c</sub> = 25°C)                        | I <sub>D</sub>                     | 12                      | ADC    |
| Continuous Drain Current (T <sub>c</sub> = 100°C)                       | I <sub>D</sub>                     | 8.4                     | ADC    |
| Single Pulsed Avalanche Current <sup>(3)</sup> (Energy <sup>(2)</sup> ) | I <sub>AS</sub> (E <sub>AS</sub> ) | 30(785)                 | A(mJ)  |
| Maximum Supply Voltage                                                  | V <sub>CC,MAX</sub>                | 30                      | V      |
| Input Voltage Range                                                     | V <sub>FB</sub>                    | -0.3 to V <sub>CC</sub> | V      |
|                                                                         | V <sub>SS</sub>                    | -0.3 to 8               | V      |
| Total Power Dissipation                                                 | P <sub>D</sub> (Watt H/S)          | 160                     | W      |
|                                                                         | Derating                           | 1.28                    | W / °C |
| Operating Junction Temperature.                                         | T <sub>J</sub>                     | +160                    | °C     |
| Operating Ambient Temperature.                                          | T <sub>A</sub>                     | -25 to +85              | °C     |
| Storage Temperature Range.                                              | T <sub>STG</sub>                   | -55 to +150             | °C     |

## Absolute Maximum Ratings (Continued)

(Ta=25°C, unless otherwise specified)

| Characteristic                                                         | Symbol                             | Value                   | Unit   |
|------------------------------------------------------------------------|------------------------------------|-------------------------|--------|
| <b>KA5S1265</b>                                                        |                                    |                         |        |
| Maximum Drain Voltage                                                  | V <sub>D,MAX</sub>                 | 650                     | V      |
| Drain-Gate Voltage(R <sub>GS</sub> =1MΩ)                               | V <sub>DGR</sub>                   | 650                     | V      |
| Gate-Source(GND) Voltage                                               | V <sub>GS</sub>                    | ±30                     | V      |
| Drain Current Pulsed <sup>(1)</sup>                                    | I <sub>DM</sub>                    | 48                      | ADC    |
| Continuous Drain Current (T <sub>c</sub> = 25°C)                       | I <sub>D</sub>                     | 12                      | ADC    |
| Continuous Drain Current (T <sub>c</sub> = 100°C)                      | I <sub>D</sub>                     | 8.4                     | ADC    |
| Single Pulsed Avalanch Current <sup>(3)</sup> (Energy <sup>(2)</sup> ) | I <sub>AS</sub> (E <sub>AS</sub> ) | 30(785)                 | A(mJ)  |
| Maximum Supply Voltage                                                 | V <sub>CC,MAX</sub>                | 30                      | V      |
| Input Voltage Range                                                    | V <sub>FB</sub>                    | -0.3 to V <sub>CC</sub> | V      |
|                                                                        | V <sub>SS</sub>                    | -0.3 to 8               | V      |
| Total Power Dissipation                                                | P <sub>D</sub> (Watt H/S)          | 160                     | W      |
|                                                                        | Derating                           | 1.28                    | W / °C |
| Operating Junction Temperature.                                        | T <sub>J</sub>                     | +160                    | °C     |
| Operating Ambient Temperature.                                         | T <sub>A</sub>                     | -25 to +85              | °C     |
| Storage Temperature Range.                                             | T <sub>STG</sub>                   | -55 to +150             | °C     |

### Note:

1. Repetitive rating : Pulse width limited by maximum junction temperature
2. L = 10mH, V<sub>DD</sub> =50V, R<sub>G</sub> = 27Ω, starting T<sub>j</sub> = 25°C
3. L = 13uH, starting T<sub>j</sub> = 25°C

## Electrical Characteristics (SFET Part)

(Ta = 25°C unless otherwise specified)

| Parameter                                        | Symbol  | Conditions                                                                                                 | Min. | Typ. | Max. | Unit |
|--------------------------------------------------|---------|------------------------------------------------------------------------------------------------------------|------|------|------|------|
| KA5S0765C                                        |         |                                                                                                            |      |      |      |      |
| Drain-source breakdown voltage                   | BVDSS   | VGS=0V, ID=50μA                                                                                            | 650  | -    | -    | V    |
| Zero gate voltage drain current                  | IDSS    | VDS=Max., Rating, VGS=0V                                                                                   | -    | -    | 50   | μA   |
|                                                  |         | VDS=0.8Max., Rating, VGS=0V, Tc=125°C                                                                      | -    | -    | 200  | μA   |
| Static drain-source on resistance <sup>(1)</sup> | RDS(on) | VGS=10V, ID=4.0A                                                                                           | -    | 1.25 | 1.6  | Ω    |
| Forward transconductance <sup>(1)</sup>          | gfs     | VDS=15V, ID=4.0A                                                                                           | 3.0  | -    | -    | S    |
| Input capacitance                                | Ciss    | VGS=0V, VDS=25V, f = 1MHz                                                                                  | -    | 1600 | -    | pF   |
| Output capacitance                               | Coss    |                                                                                                            | -    | 310  | -    |      |
| Reverse transfer capacitance                     | Crss    |                                                                                                            | -    | 120  | -    |      |
| Turn on delay time                               | td(on)  | VDD=0.5BVDSS, ID=7.0A (MOSFET switching time are essentially independent of operating temperature)         | -    | 25   | -    | nS   |
| Rise time                                        | tr      |                                                                                                            | -    | 55   | -    |      |
| Turn off delay time                              | td(off) |                                                                                                            | -    | 80   | -    |      |
| Fall time                                        | tf      |                                                                                                            | -    | 50   | -    |      |
| Total gate charge (gate-source+gate-drain)       | Qg      | VGS=10V, ID=7.0A, VDS=0.5BVDSS(MOSFET Switching time are Essentially independent of Operating temperature) | -    | -    | 72   | nC   |
| Gate-source charge                               | Qgs     |                                                                                                            | -    | 9.3  | -    |      |
| Gate-drain (Miller) charge                       | Qgd     |                                                                                                            | -    | 29.3 | -    |      |
| KA5S09654QT                                      |         |                                                                                                            |      |      |      |      |
| Drain-source breakdown voltage                   | BVDSS   | VGS=0V, ID=50μA                                                                                            | 650  | -    | -    | V    |
| Zero gate voltage drain current                  | IDSS    | VDS=Max., Rating, VGS=0V                                                                                   | -    | -    | 200  | μA   |
|                                                  |         | VDS=0.8Max., Rating, VGS=0V, Tc=125°C                                                                      | -    | -    | 300  | μA   |
| Static drain-source on resistance <sup>(1)</sup> | RDS(on) | VGS=10V, ID=4.5A                                                                                           | -    | 1.1  | 1.2  | Ω    |
| Forward transconductance <sup>(1)</sup>          | gfs     | VDS=50V, ID=4.5A                                                                                           | 3.0  | -    | -    | S    |
| Input capacitance                                | Ciss    | VGS=0V, VDS=25V, f = 1MHz                                                                                  | -    | 1300 | -    | pF   |
| Output capacitance                               | Coss    |                                                                                                            | -    | 135  | -    |      |
| Reverse transfer capacitance                     | Crss    |                                                                                                            | -    | 25   | -    |      |
| Turn on delay time                               | td(on)  | VDD=0.5BVDSS, ID=9.0A (MOSFET switching time are essentially independent of operating temperature)         | -    | 25   | -    | nS   |
| Rise time                                        | tr      |                                                                                                            | -    | 75   | -    |      |
| Turn off delay time                              | td(off) |                                                                                                            | -    | 130  | -    |      |
| Fall time                                        | tf      |                                                                                                            | -    | 70   | -    |      |
| Total gate charge (gate-source+gate-drain)       | Qg      | VGS=10V, ID=9.0A, VDS=0.5BVDSS(MOSFET Switching time are Essentially independent of Operating temperature) |      | 45   | -    | nC   |
| Gate-source charge                               | Qgs     |                                                                                                            | -    | 8    | -    |      |
| Gate-drain (Miller) charge                       | Qgd     |                                                                                                            | -    | 22   | -    |      |

**Electrical Characteristics (SFET Part; Continued)**

(Ta = 25°C unless otherwise specified)

| Parameter                                        | Symbol  | Conditions                                                                                                  | Min. | Typ. | Max. | Unit |
|--------------------------------------------------|---------|-------------------------------------------------------------------------------------------------------------|------|------|------|------|
| KA5S0965                                         |         |                                                                                                             |      |      |      |      |
| Drain-source breakdown voltage                   | BVDSS   | VGS=0V, ID=50μA                                                                                             | 650  | -    | -    | V    |
| Zero gate voltage drain current                  | IDSS    | VDS=Max., Rating, VGS=0V                                                                                    | -    | -    | 50   | μA   |
|                                                  |         | VDS=0.8Max., Rating, VGS=0V, Tc=125°C                                                                       | -    | -    | 200  | μA   |
| Static drain-source on resistance <sup>(1)</sup> | RDS(on) | VGS=10V, ID=4.5A                                                                                            | -    | 0.96 | 1.2  | Ω    |
| Forward transconductance <sup>(1)</sup>          | gfs     | VDS=50V, ID=4.5A                                                                                            | 5.0  | -    | -    | S    |
| Input capacitance                                | Ciss    | VGS=0V, VDS=25V, f = 1MHz                                                                                   | -    | 1750 | -    | pF   |
| Output capacitance                               | Coss    |                                                                                                             | -    | 190  | -    |      |
| Reverse transfer capacitance                     | Crss    |                                                                                                             | -    | 78   | -    |      |
| Turn on delay time                               | td(on)  | VDD=0.5BVDSS, ID=9.0A (MOSFET switching time are essentially independent of operating temperature)          | -    | 20   | 50   | nS   |
| Rise time                                        | tr      |                                                                                                             | -    | 23   | 55   |      |
| Turn off delay time                              | td(off) |                                                                                                             | -    | 85   | 180  |      |
| Fall time                                        | tf      |                                                                                                             | -    | 30   | 70   |      |
| Total gate charge (gate-source+gate-drain)       | Qg      | VGS=10V, ID=9.0A, VDS=0.5BVDSS(MOSFET Switching time are Essentially independent of Operating temperature)  | -    | 74   | 95   | nC   |
| Gate-source charge                               | Qgs     |                                                                                                             | -    | 12   | -    |      |
| Gate-drain (Miller) charge                       | Qgd     |                                                                                                             | -    | 35   | -    |      |
| KA5S12656                                        |         |                                                                                                             |      |      |      |      |
| Drain-source breakdown voltage                   | BVDSS   | VGS=0V, ID=50μA                                                                                             | 650  | -    | -    | V    |
| Zero gate voltage drain current                  | IDSS    | VDS=Max., Rating, VGS=0V                                                                                    | -    | -    | 50   | μA   |
|                                                  |         | VDS=0.8Max., Rating, VGS=0V, Tc=125°C                                                                       | -    | -    | 200  | μA   |
| Static drain-source on resistance <sup>(1)</sup> | RDS(on) | VGS=10V, ID=6.0A                                                                                            | -    | 0.72 | 0.9  | Ω    |
| Forward transconductance <sup>(1)</sup>          | gfs     | VDS=50V, ID=4.0A                                                                                            | 5.7  | -    | -    | S    |
| Input capacitance                                | Ciss    | VGS=0V, VDS=25V, f = 1MHz                                                                                   | -    | 2700 | -    | pF   |
| Output capacitance                               | Coss    |                                                                                                             | -    | 300  | -    |      |
| Reverse transfer capacitance                     | Crss    |                                                                                                             | -    | 61   | -    |      |
| Turn on delay time                               | td(on)  | VDD=0.5BVDSS, ID=12.0A (MOSFET switching time are essentially independent of operating temperature)         | -    | 18   | -    | nS   |
| Rise time                                        | tr      |                                                                                                             | -    | 37   | -    |      |
| Turn off delay time                              | td(off) |                                                                                                             | -    | 88   | -    |      |
| Fall time                                        | tf      |                                                                                                             | -    | 36   | -    |      |
| Total gate charge (gate-source+gate-drain)       | Qg      | VGS=10V, ID=12.0A, VDS=0.5BVDSS(MOSFET Switching time are Essentially independent of Operating temperature) | -    | -    | 140  | nC   |
| Gate-source charge                               | Qgs     |                                                                                                             | -    | 20   | -    |      |
| Gate-drain (Miller) charge                       | Qgd     |                                                                                                             | -    | 69   | -    |      |

## Electrical Characteristics (SFET Part; Continued)

(Ta = 25°C unless otherwise specified)

| Parameter                                        | Symbol  | Conditions                                                                                                  | Min. | Typ. | Max. | Unit |
|--------------------------------------------------|---------|-------------------------------------------------------------------------------------------------------------|------|------|------|------|
| <b>KA5S1265</b>                                  |         |                                                                                                             |      |      |      |      |
| Drain-source breakdown voltage                   | BVDSS   | VGS=0V, ID=50μA                                                                                             | 650  | -    | -    | V    |
| Zero gate voltage drain current                  | IDSS    | VDS=Max., Rating, VGS=0V                                                                                    | -    | -    | 50   | μA   |
|                                                  |         | VDS=0.8Max., Rating, VGS=0V, Tc=125°C                                                                       | -    | -    | 200  | μA   |
| Static drain-source on resistance <sup>(1)</sup> | RDS(on) | VGS=10V, ID=6.0A                                                                                            | -    | 0.72 | 0.9  | Ω    |
| Forward transconductance <sup>(1)</sup>          | gfs     | VDS=50V, ID=4.0A                                                                                            | 5.7  | -    | -    | S    |
| Input capacitance                                | Ciss    | VGS=0V, VDS=25V, f = 1MHz                                                                                   | -    | 2700 | -    | pF   |
| Output capacitance                               | Coss    |                                                                                                             | -    | 300  | -    |      |
| Reverse transfer capacitance                     | Crss    |                                                                                                             | -    | 61   | -    |      |
| Turn on delay time                               | td(on)  | VDD=0.5BVDSS, ID=12.0A<br>(MOSFET switching time are essentially independent of operating temperature)      | -    | 18   | -    | nS   |
| Rise time                                        | tr      |                                                                                                             | -    | 37   | -    |      |
| Turn off delay time                              | td(off) |                                                                                                             | -    | 88   | -    |      |
| Fall time                                        | tf      |                                                                                                             | -    | 36   | -    |      |
| Total gate charge (gate-source+gate-drain)       | Qg      | VGS=10V, ID=12.0A, VDS=0.5BVDSS(MOSFET Switching time are Essentially independent of Operating temperature) | -    | -    | 140  | nC   |
| Gate-source charge                               | Qgs     |                                                                                                             | -    | 20   | -    |      |
| Gate-drain (Miller) charge                       | Qgd     |                                                                                                             | -    | 69   | -    |      |

**Note:**

1. Pulse Test : Pulse width ≤ 300μs, Duty Cycle ≤ 2%

2. MOSFET Switching Time are Essentially Independent of Operating Temperature

3.  $S = \frac{1}{R}$

## Electrical Characteristics (CONTROL Part)

(V<sub>CC</sub>=16V, T<sub>amb</sub> = 25°C unless otherwise specified)

| Parameter                             | Symbol   | Conditions       | Min. | Typ. | Max. | Unit |
|---------------------------------------|----------|------------------|------|------|------|------|
| UVLO SECTION                          |          |                  |      |      |      |      |
| Start Threshold Voltage               | VSTART   | VFB=GND          | 14   | 15   | 16   | V    |
| StopThreshold Voltage                 | VSTOP    | VFB=GND          | 8    | 9    | 10   | V    |
| OSCILLATOR SECTION                    |          |                  |      |      |      |      |
| Initial Frequency                     | FOSC     | -                | 18   | 20   | 22   | kHz  |
| Voltage Stability                     | FSTABLE  | 12V ≤ VCC ≤ 23V  | 0    | 1    | 3    | %    |
| Temperature Stability (Note2)         | ΔFOSC    | -25°C ≤ Ta≤ 85°C | 0    | ±5   | ±10  | %    |
| Maximum Duty Cycle                    | DMAX     | -                | 92   | 95   | 98   | %    |
| Minimum Duty Cycle                    | DMIN     | -                | -    | -    | 0    | %    |
| FEEDBACK SECTION                      |          |                  |      |      |      |      |
| Feedback Source Current               | IFB      | VFB=GND          | 0.7  | 0.9  | 1.1  | mA   |
| Shutdown Feedback Voltage             | VSD      | VFB ≥ 6.9V       | 6.9  | 7.5  | 8.1  | V    |
| Shutdown Delay Current                | IDELAY   | VFB=5V           | 3.0  | 4.0  | 5.0  | μA   |
| SYNC. & SOFTSTART SECTION             |          |                  |      |      |      |      |
| Softstart Voltage                     | VSS      | VFB=2V           | 4.7  | 5.0  | 5.3  | V    |
| Softstart Current                     | ISS      | VSS=0V           | 0.75 | 0.95 | 1.15 | mA   |
| Sync High Threshold Voltage(Note3)    | VSYNCH   | VCC=16V , VFB=5V | -    | 7.0  | -    | V    |
| Sync Low Threshold Voltage(Note3)     | VSYNCL   | VCC=16V , VFB=5V | -    | 6.0  | -    | V    |
| CURRENT LIMIT(SELF-PROTECTION)SECTION |          |                  |      |      |      |      |
| Peak Current Limit (Note4)            | IOVER    | KA5S0765C        | 3.52 | 4.0  | 4.48 | A    |
|                                       |          | KA5S09654QT      | 3.52 | 4.0  | 4.48 |      |
|                                       |          | KA5S0965         | 5.28 | 6.0  | 6.72 |      |
|                                       |          | KA5S12656        | 5.28 | 6.0  | 6.72 |      |
|                                       |          | KA5S1265         | 7.04 | 8.0  | 8.96 |      |
| PROTECTION SECTION                    |          |                  |      |      |      |      |
| Over Voltage Protction                | VOVP     | VCC ≥ 24V        | 23   | 25   | 28   | V    |
| Over Current Latch voltage(Note3)     | VOCL     | -                | 0.9  | 1.0  | 1.1  | V    |
| Thermal Shutdown Tempature(Note2)     | TSD      | -                | 140  | 160  | -    | °C   |
| TOTAL DEVICE SECTION                  |          |                  |      |      |      |      |
| Start Up Current                      | ISTART   | VFB=GND, VCC=14V | -    | 0.1  | 0.17 | mA   |
| Operating Supply Current(Note1)       | IOP      | VFB=GND, VCC=16V | -    | 7    | 12   | mA   |
|                                       | IOP(MIN) | VFB=GND, VCC=12V |      |      |      |      |
|                                       | IOP(MAX) | VFB=GND, VCC=30V |      |      |      |      |

**Note:**

1. These parameters is the Current Flowing in the Control IC.
2. These parameters, although guaranteed, are not 100% tested in production
3. These parameters, although guaranteed, are tested in EDS(wafer test) process
4. These parameters are indicated Inductor Current.

# Typical Performance Characteristics

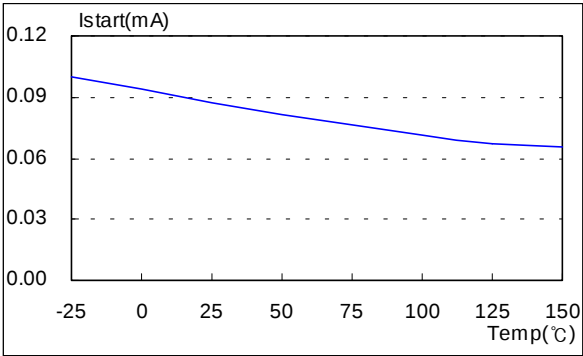


Figure 1. Start Up Current vs. Temp.

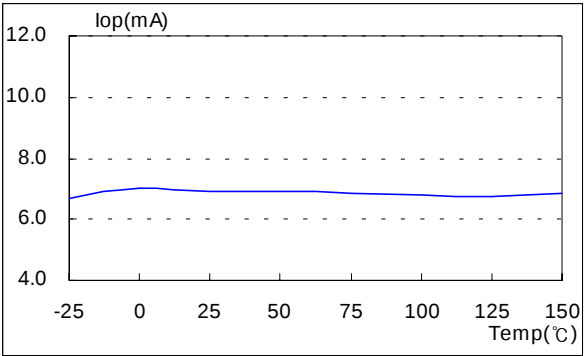


Figure 2. Operating Supply Current vs. Temp.

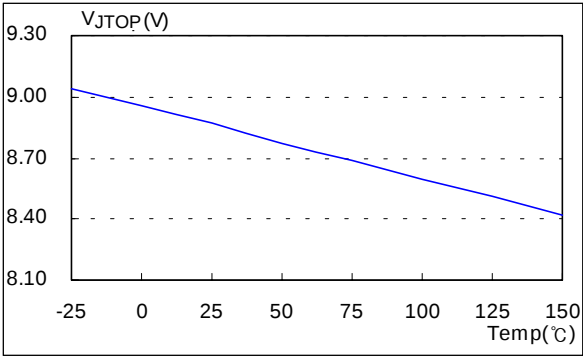


Figure 3. Stop Threshold Voltage

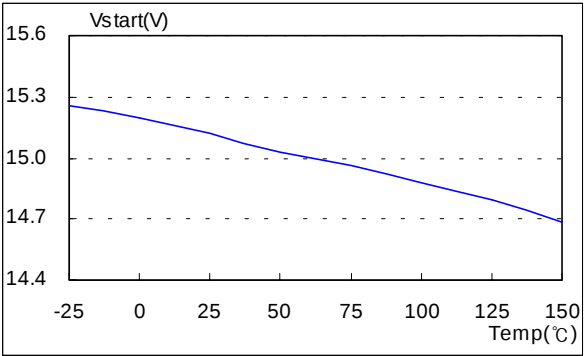


Figure 4. Start Threshold Voltage

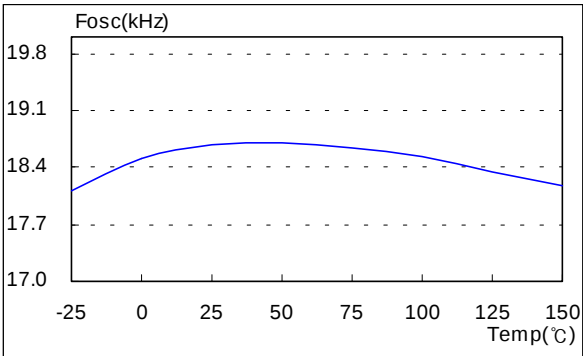


Figure 5. Initial Frequency VS. Temp

## Typical Performance Characteristics(Continued)

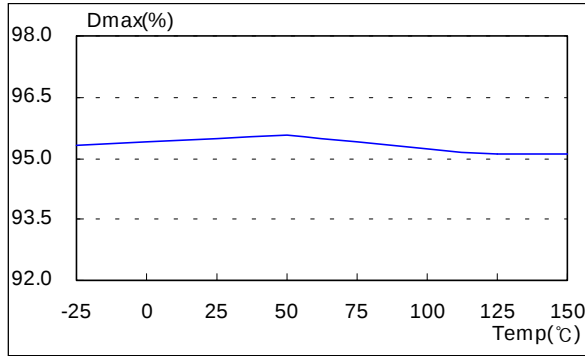


Figure 6. Maximum Duty vs. Temp.

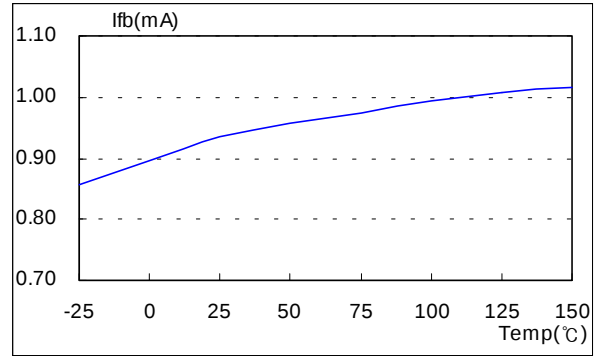


Figure 7. Feedback Source Current vs. Temp.

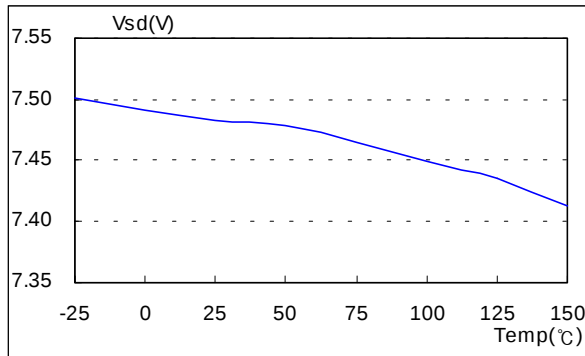


Figure 8. Shutdown Feedback Voltage vs. Temp.

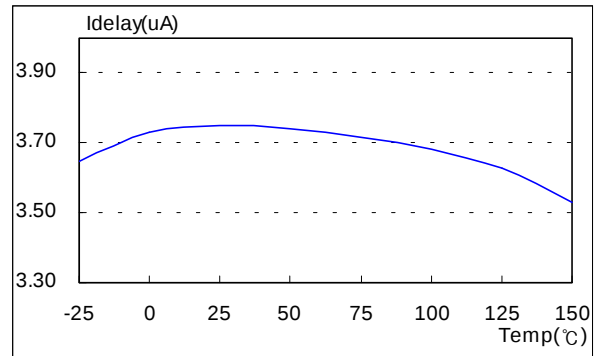


Figure 9. Shutdown Delay Current vs. Temp.

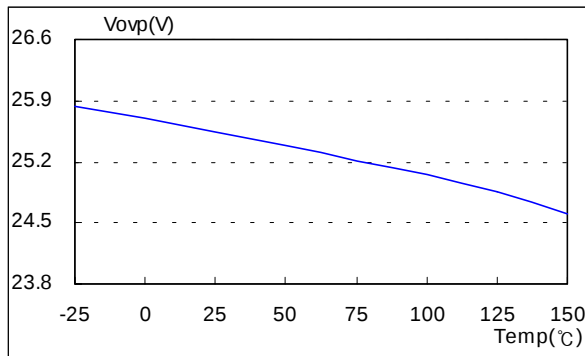


Figure 10. Over Voltage Protection vs. Temp.

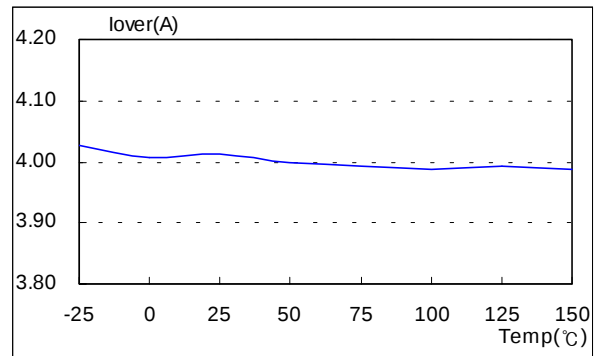


Figure 11. Peak Current Limit

Typical Performance Characteristics(Continued)

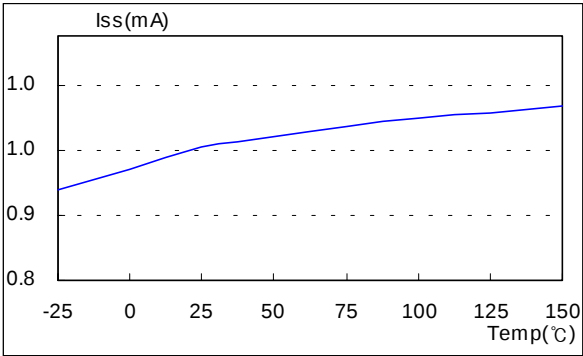


Figure 12. Soft Start Current vs. Temp.

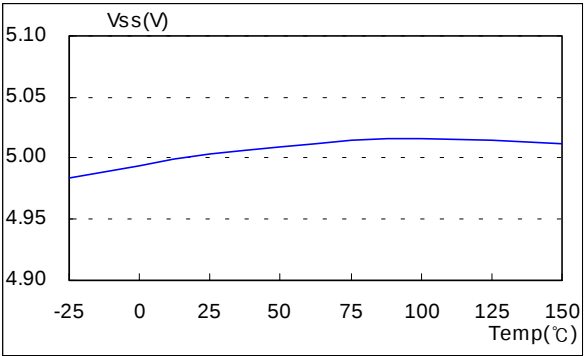
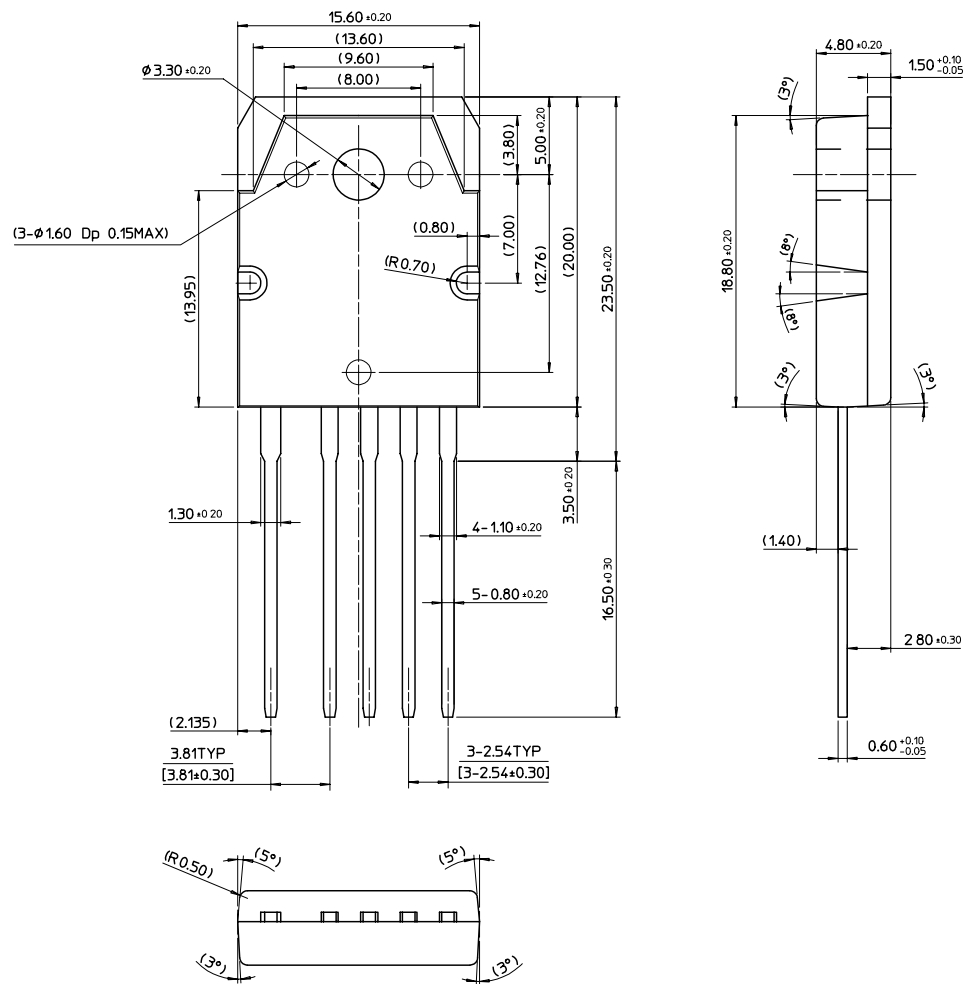


Figure 13. Soft Start Voltage vs. Temp.

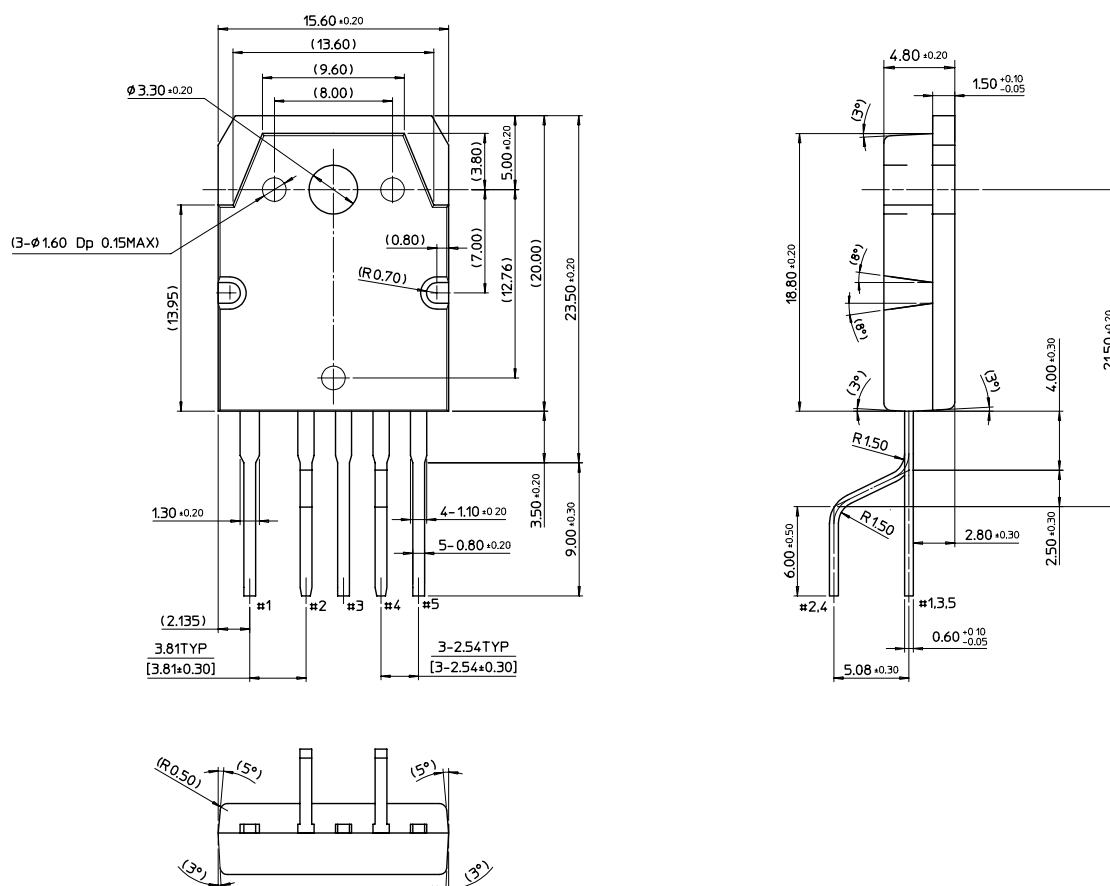
## Package Dimensions

## TO-3P-5L



## Package Dimensions (Continued)

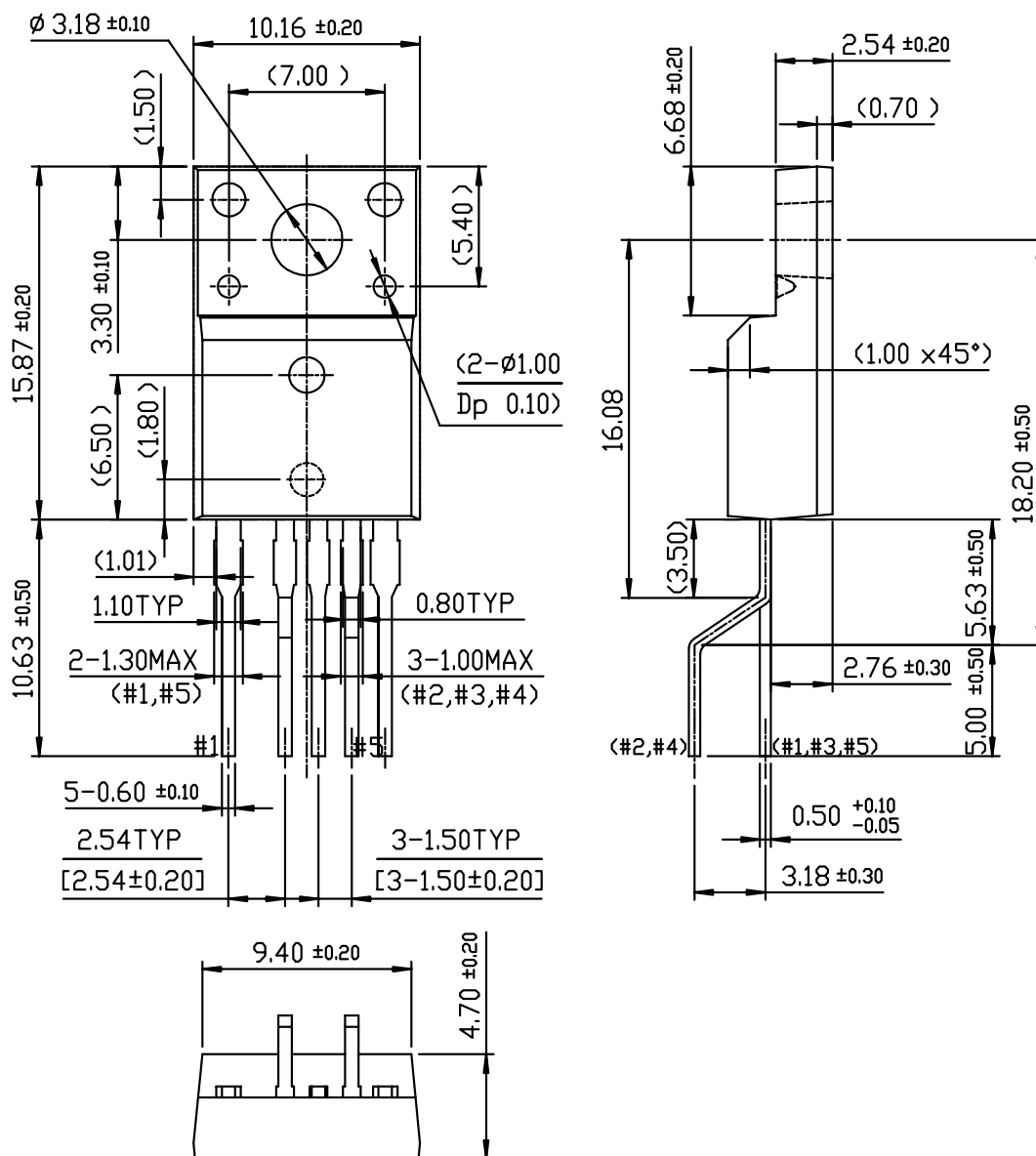
## TO-3P-5L (Forming)





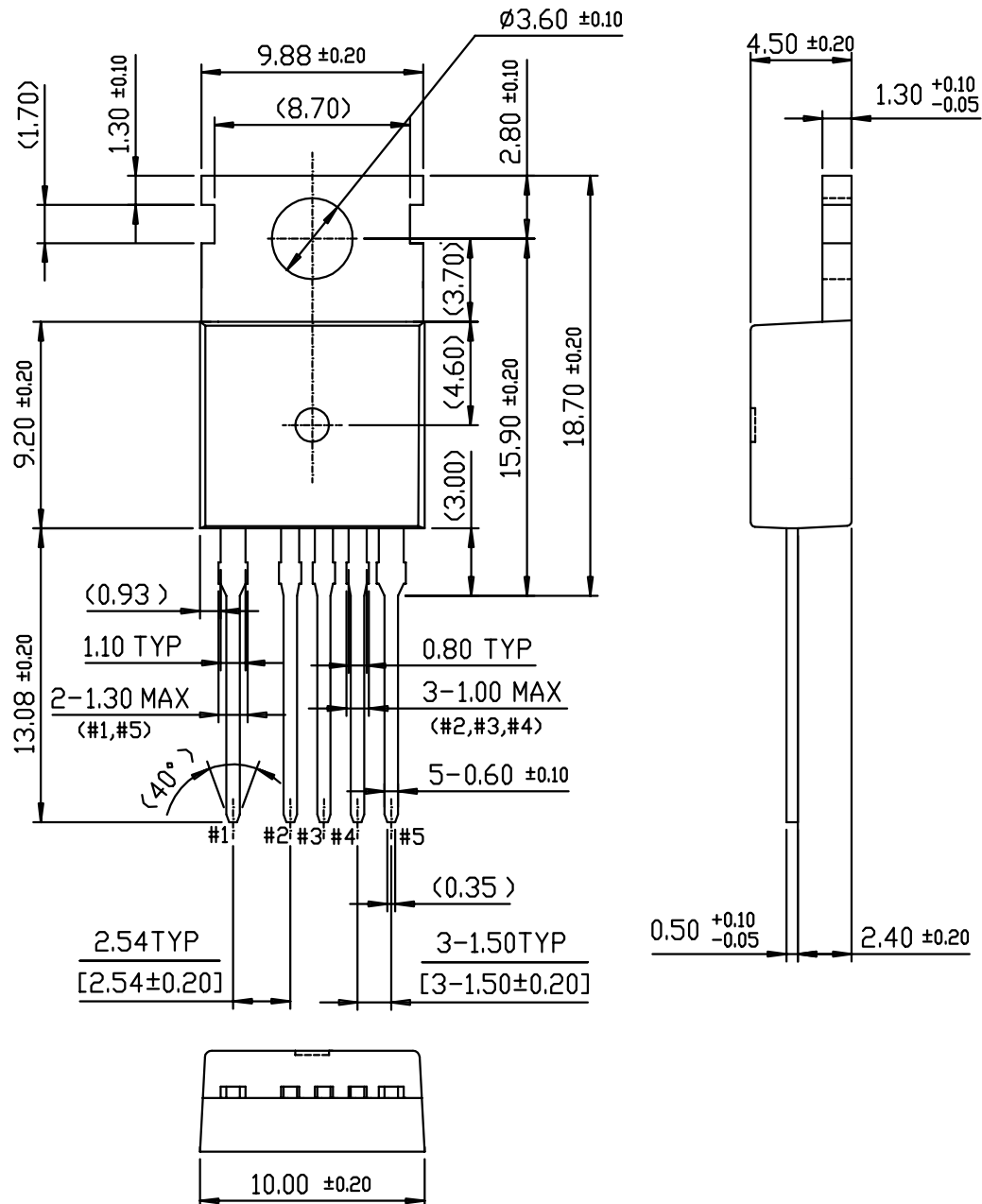
## Package Dimensions (Continued)

## TO-220F-5L(Forming)



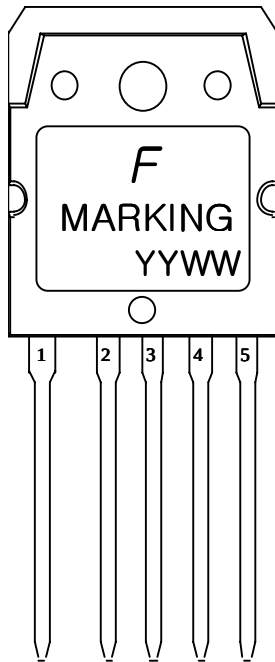
## Package Dimensions (Continued)

## TO-220-5L





## TOP Mark and Pinout Information



| Pin No. | Symbol | Description                 |
|---------|--------|-----------------------------|
| 1       | Drain  | SenseFET Drain              |
| 2       | GND    | Ground (Source)             |
| 3       | VCC    | Control Part Supply Input   |
| 4       | F/B    | PWM Non Inverting Input     |
| 5       | S/S    | Soft start & External Sync. |

| Device      | MARKING |
|-------------|---------|
| KA5S0765C   | 5S0765C |
| KA5S09654QT | 5S09654 |
| KA5S0965    | 5S0965  |
| KA5S12656   | 5S12656 |
| KA5S1265    | 5S1265  |

### Notes ;

- (1) F ; Fairchild Semiconductor
- (2) 5S0765C, 5S09654, 5S0965, 5S12656, 5S1265; Device Marking Name
- (3) YY: Last Two Digit of Calender Year
- (4) WW: Patweek Based on Fairchild Semiconductor Work Month Calender

## Ordering Information

| Product Number   | Package             | Marking Code | BVdss | Rds(on) |
|------------------|---------------------|--------------|-------|---------|
| KA5S0765C-TU     | TO-220-5L           | 5S0765C      | 650V  | 1.6Ω    |
| KA5S0765C-YDTU   | TO-220-5L(Forming)  |              |       |         |
| KA5S09654QT-TU   | TO-220F-5L          | 5S09654      | 650V  | 1.1Ω    |
| KA5S09654QT-YDTU | TO-220F-5L(Forming) |              |       |         |
| KA5S0965-TU      | TO-3P-5L            | 5S0965       | 650V  | 1.2Ω    |
| KA5S0965-YDTU    | TO-3P-5L(Forming)   |              |       |         |
| KA5S12656-TU     | TO-3P-5L            | 5S12656      | 650V  | 0.9Ω    |
| KA5S12656-YDTU   | TO-3P-5L(Forming)   |              |       |         |
| KA5S1265-TU      | TO-3P-5L            | 5S1265       | 650V  | 0.9Ω    |
| KA5S1265-YDTU    | TO-3P-5L(Forming)   |              |       |         |

TU : Non Forming Type

YDTU : Forming Type

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2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.