



L780S00 Series

5 to 24V 1A 5-Pin Voltage Regulators with Strobe Pin

Features

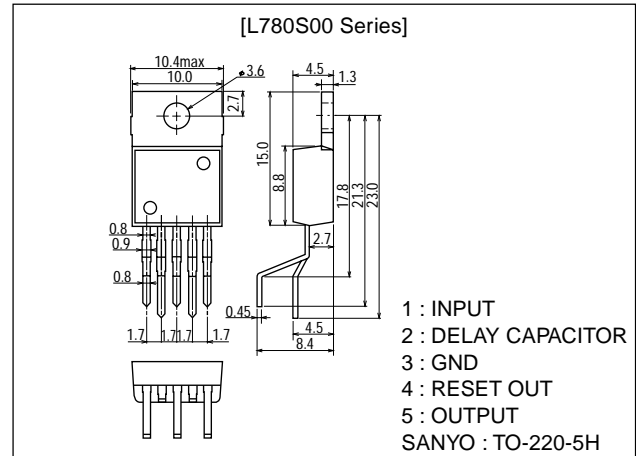
- Output voltage

| | | |
|---------------|---------------|---------------|
| L780S05 : 5V | L780S06 : 6V | L780S07 : 7V |
| L780S08 : 8V | L780S09 : 9V | L780S10 : 10V |
| L780S12 : 12V | L780S15 : 15V | L780S18 : 18V |
| L780S20 : 20V | L780S24 : 24V | |
- The strobe pin can be used to turn ON/OFF output voltage (active-low).
- 1A output current.
- On-chip thermal protector.
- On-chip overcurrent limiter.
- On-chip ASO protector.
- The use of package TO-220-5H (5 pins) facilitates mounting and thermal design.

Package Dimensions

unit:mm

3079



Specifications

[Common to L780S00 series]

Maximum Ratings at $T_a = 25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | Unit |
|-----------------------------|----------------|------------------------|-------------|--------------------|
| Maximum Supply Voltage | V_{CC} max | Pin 1 | 35 | V |
| Strobe Input Voltage | V_{ST} max | Pin 4 | 18 | V |
| Strobe Input Current | I_{ST} max | Pin 4 | 5 | mA |
| Allowable Power Dissipation | P_d max | | 1.75 | W |
| | | $T_c=25^\circ\text{C}$ | 20 | W |
| Thermal Resistance | θ_{j-c} | | 5 | $^\circ\text{C/W}$ |
| Operating Temperature | T_{opr} | | -20 to +80 | $^\circ\text{C}$ |
| Storage Temperature | T_{stg} | | -55 to +150 | $^\circ\text{C}$ |

Strobe Operating Characteristics at $T_a = 25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | Unit |
|--------------------------------|----------------|------------|---------|------|
| Strobe Operation Start Voltage | V_{st} (on) | | 2.4 | V |
| Strobe Operation Stop Voltage | V_{st} (off) | | 0.5 | V |

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L780S00 Series

[L780S05]

Recommended Operating Conditions at $T_a = 25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | Unit |
|----------------------|----------|------------|-------------|------|
| Input Voltage Range | V_{IN} | | 7.5 to 20.0 | V |
| Output Current Range | I_O | | 5 to 1000 | mA |

Operating Characteristics at $T_j = 25^\circ\text{C}$, $V_{IN}=10\text{V}$, $I_O=500\text{mA}$, $V_{st}=0\text{V}$, $*T_a = 25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|--------------------------------------|-------------------|---|---------|------|------|---------------|
| | | | min | typ | max | |
| Output Voltage1 | V_{O1} | | 4.8 | 5.0 | 5.2 | V |
| Line Regulation1 | ΔV_{O1n1} | $7\text{V} \leq V_{IN} \leq 25\text{V}$ | | 3 | 100 | mV |
| Line Regulation2 | ΔV_{O1n2} | $8\text{V} \leq V_{IN} \leq 12\text{V}$ | | 1 | 50 | mV |
| Load Regulation1 | ΔV_{O1d1} | $5\text{mA} \leq I_O \leq 1.5\text{A}$ | | | 100 | mV |
| Load Regulation2 | ΔV_{O1d2} | $250\text{mA} \leq I_O \leq 750\text{mA}$ | | | 50 | mV |
| Output Voltage2 | V_{O2} | $7\text{V} \leq V_{IN} \leq 20\text{V}$, $5\text{mA} \leq V_{IN} \leq 1\text{A}$ | 4.75 | | 5.25 | V |
| Current Dissipation | I_{CC} | | | | 8.0 | mA |
| Current Dissipation Variation (Line) | ΔI_{CCln} | $7\text{V} \leq V_{IN} \leq 25\text{V}$ | | | 1.3 | mA |
| Current Dissipation Variation (Load) | ΔI_{CCld} | $5\text{mA} \leq I_O \leq 1\text{A}$ | | | 0.5 | mA |
| Output Noise Voltage | V_{NO} | $10\text{Hz} \leq f \leq 100\text{kHz}^*$ | | 40 | | μV |
| Ripple Rejection | R_r | $f=120\text{Hz}$, $8\text{V} \leq V_{IN} \leq 18\text{V}$ | 62 | 78 | | dB |
| Dropout voltage | V_{drop} | $I_O=1\text{A}$ | | 2.0 | | V |
| Output Short Current | I_{OS} | $V_{IN}=35\text{V}$ | | 0.75 | | A |
| Peak Output Current | I_{OP} | | | 2.2 | | A |
| Output Voltage at Strobe Mode | $V_{O(ston)}$ | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 0.8 | V |
| Current Dissipation at Strobe Mode | $I_{CC(ston)}$ | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 3.0 | mA |
| Strobe Input Current | I_{st} | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 1.0 | mA |

[L780S06]

Recommended Operating Conditions at $T_a = 25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | Unit |
|----------------------|----------|------------|-------------|------|
| Input Voltage Range | V_{IN} | | 8.5 to 21.0 | V |
| Output Current Range | I_O | | 5 to 1000 | mA |

Operating Characteristics at $T_j = 25^\circ\text{C}$, $V_{IN}=11\text{V}$, $I_O=500\text{mA}$, $V_{st}=0\text{V}$, $*T_a = 25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|--------------------------------------|-------------------|---|---------|------|------|---------------|
| | | | min | typ | max | |
| Output Voltage1 | V_{O1} | | 5.75 | 6.0 | 6.25 | V |
| Line Regulation1 | ΔV_{O1n1} | $8\text{V} \leq V_{IN} \leq 25\text{V}$ | | 5 | 120 | mV |
| Line Regulation2 | ΔV_{O1n2} | $9\text{V} \leq V_{IN} \leq 13\text{V}$ | | 1.5 | 60 | mV |
| Load Regulation1 | ΔV_{O1d1} | $5\text{mA} \leq I_O \leq 1.5\text{A}$ | | | 120 | mV |
| Load Regulation2 | ΔV_{O1d2} | $250\text{mA} \leq I_O \leq 750\text{mA}$ | | | 60 | mV |
| Output Voltage2 | V_{O2} | $8\text{V} \leq V_{IN} \leq 21\text{V}$, $5\text{mA} \leq V_{IN} \leq 1\text{A}$ | 5.7 | | 6.3 | V |
| Current Dissipation | I_{CC} | | | | 8.0 | mA |
| Current Dissipation Variation (Line) | ΔI_{CCln} | $8\text{V} \leq V_{IN} \leq 25\text{V}$ | | | 1.3 | mA |
| Current Dissipation Variation (Load) | ΔI_{CCld} | $5\text{mA} \leq I_O \leq 1\text{A}$ | | | 0.5 | mA |
| Output Noise Voltage | V_{NO} | $10\text{Hz} \leq f \leq 100\text{kHz}^*$ | | 45 | | μV |
| Ripple Rejection | R_r | $f=120\text{Hz}$, $9\text{V} \leq V_{IN} \leq 19\text{V}$ | 59 | 75 | | dB |
| Dropout voltage | V_{drop} | $I_O=1\text{A}$ | | 2.0 | | V |
| Output Short Current | I_{OS} | $V_{IN}=35\text{V}$ | | 0.75 | | A |
| Peak Output Current | I_{OP} | | | 2.2 | | A |
| Output Voltage at Strobe Mode | $V_{O(ston)}$ | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 0.8 | V |
| Current Dissipation at Strobe Mode | $I_{CC(ston)}$ | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 3.0 | mA |
| Strobe Input Current | I_{st} | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 1.0 | mA |

L780S00 Series

[L780S07]

Recommended Operating Conditions at $T_a = 25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | Unit |
|----------------------|----------|------------|-------------|------|
| Input Voltage Range | V_{IN} | | 9.5 to 22.0 | V |
| Output Current Range | I_O | | 5 to 1000 | mA |

Operating Characteristics at $T_j = 25^\circ\text{C}$, $V_{IN}=12\text{V}$, $I_O=500\text{mA}$, $V_{st}=0\text{V}$, $*T_a = 25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|--------------------------------------|-------------------|---|---------|------|------|---------------|
| | | | min | typ | max | |
| Output Voltage1 | V_{O1} | | 6.72 | 7.0 | 7.28 | V |
| Line Regulation1 | ΔV_{Oln1} | $9\text{V} \leq V_{IN} \leq 26\text{V}$ | | 6 | 140 | mV |
| Line Regulation2 | ΔV_{Oln2} | $10\text{V} \leq V_{IN} \leq 14\text{V}$ | | 2 | 70 | mV |
| Load Regulation1 | ΔV_{Old1} | $5\text{mA} \leq I_O \leq 1.5\text{A}$ | | | 140 | mV |
| Load Regulation2 | ΔV_{Old2} | $250\text{mA} \leq I_O \leq 750\text{mA}$ | | | 70 | mV |
| Output Voltage2 | V_{O2} | $9\text{V} \leq V_{IN} \leq 22\text{V}$, $5\text{mA} \leq V_{IN} \leq 1\text{A}$ | 6.65 | | 7.35 | V |
| Current Dissipation | I_{CC} | | | | 8.0 | mA |
| Current Dissipation Variation (Line) | ΔI_{CCln} | $9\text{V} \leq V_{IN} \leq 25\text{V}$ | | | 1.3 | mA |
| Current Dissipation Variation (Load) | ΔI_{CCld} | $5\text{mA} \leq I_O \leq 1\text{A}$ | | | 0.5 | mA |
| Output Noise Voltage | V_{NO} | $10\text{Hz} \leq f \leq 100\text{kHz}^*$ | | 46 | | μV |
| Ripple Rejection | R_r | $f=120\text{Hz}$, $10\text{V} \leq V_{IN} \leq 21\text{V}$ | 58 | 73 | | dB |
| Dropout voltage | V_{drop} | $I_O=1\text{A}$ | | 2.0 | | V |
| Output Short Current | I_{OS} | $V_{IN}=35\text{V}$ | | 0.75 | | A |
| Peak Output Current | I_{OP} | | | 2.2 | | A |
| Output Voltage at Strobe Mode | $V_{O(ston)}$ | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 0.8 | V |
| Current Dissipation at Strobe Mode | $I_{CC(ston)}$ | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 3.0 | mA |
| Strobe Input Current | I_{st} | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 1.0 | mA |

[L780S08]

Recommended Operating Conditions at $T_a = 25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | Unit |
|----------------------|----------|------------|--------------|------|
| Input Voltage Range | V_{IN} | | 10.5 to 23.0 | V |
| Output Current Range | I_O | | 5 to 1000 | mA |

Operating Characteristics at $T_j = 25^\circ\text{C}$, $V_{IN}=15\text{V}$, $I_O=500\text{mA}$, $V_{st}=0\text{V}$, $*T_a = 25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|--------------------------------------|-------------------|--|---------|------|-----|---------------|
| | | | min | typ | max | |
| Output Voltage1 | V_{O1} | | 7.7 | 8.0 | 8.3 | V |
| Line Regulation1 | ΔV_{On1} | $10.5\text{V} \leq V_{IN} \leq 25\text{V}$ | | 6.0 | 160 | mV |
| Line Regulation2 | ΔV_{Oln2} | $11\text{V} \leq V_{IN} \leq 17\text{V}$ | | 2.0 | 80 | mV |
| Load Regulation1 | ΔV_{Old1} | $5\text{mA} \leq I_O \leq 1.5\text{A}$ | | | 160 | mV |
| Load Regulation2 | ΔV_{Old2} | $250\text{mA} \leq I_O \leq 750\text{mA}$ | | | 80 | mV |
| Output Voltage2 | V_{O2} | $10.5\text{V} \leq V_{IN} \leq 23\text{V}$, $5\text{mA} \leq V_{IN} \leq 1\text{A}$ | 7.6 | | 8.4 | V |
| Current Dissipation | I_{CC} | | | | 8.0 | mA |
| Current Dissipation Variation (Line) | ΔI_{CCln} | $10.5\text{V} \leq V_{IN} \leq 25\text{V}$ | | | 1.0 | mA |
| Current Dissipation Variation (Load) | ΔI_{CCld} | $5\text{mA} \leq I_O \leq 1\text{A}$ | | | 0.5 | mA |
| Output Noise Voltage | V_{NO} | $10\text{Hz} \leq f \leq 100\text{kHz}^*$ | | 52 | | μV |
| Ripple Rejection | R_r | $f=120\text{Hz}$, $11.5\text{V} \leq V_{IN} \leq 21.5\text{V}$ | 56 | 72 | | dB |
| Dropout voltage | V_{drop} | $I_O=1\text{A}$ | | 2.0 | | V |
| Output Short Current | I_{OS} | $V_{IN}=35\text{V}$ | | 0.75 | | A |
| Peak Output Current | I_{OP} | | | 2.2 | | A |
| Output Voltage at Strobe Mode | $V_{O(ston)}$ | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 0.8 | V |
| Current Dissipation at Strobe Mode | $I_{CC(ston)}$ | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 3.0 | mA |
| Strobe Input Current | I_{st} | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 1.0 | mA |

L780S00 Series

[L780S09]

Recommended Operating Conditions at $T_a = 25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | Unit |
|----------------------|----------|------------|--------------|------|
| Input Voltage Range | V_{IN} | | 11.5 to 25.0 | V |
| Output Current Range | I_O | | 5 to 1000 | mA |

Operating Characteristics at $T_j = 25^\circ\text{C}$, $V_{IN}=16\text{V}$, $I_O=500\text{mA}$, $V_{st}=0\text{V}$, $*T_a = 25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|--------------------------------------|-------------------|--|---------|------|------|---------------|
| | | | min | typ | max | |
| Output Voltage1 | V_{O1} | | 8.64 | 9.0 | 9.36 | V |
| Line Regulation1 | ΔV_{O1n1} | $11.5\text{V} \leq V_{IN} \leq 25\text{V}$ | | 7 | 180 | mV |
| Line Regulation2 | ΔV_{O1n2} | $12\text{V} \leq V_{IN} \leq 20\text{V}$ | | 2 | 90 | mV |
| Load Regulation1 | ΔV_{O1d1} | $5\text{mA} \leq I_O \leq 1.5\text{A}$ | | | 180 | mV |
| Load Regulation2 | ΔV_{O1d2} | $250\text{mA} \leq I_O \leq 750\text{mA}$ | | | 90 | mV |
| Output Voltage2 | V_{O2} | $11.5\text{V} \leq V_{IN} \leq 24\text{V}$, $5\text{mA} \leq V_{IN} \leq 1\text{A}$ | 8.55 | | 9.45 | V |
| Current Dissipation | I_{CC} | | | | 8.0 | mA |
| Current Dissipation Variation (Line) | ΔI_{CCln} | $11.5\text{V} \leq V_{IN} \leq 26\text{V}$ | | | 1.0 | mA |
| Current Dissipation Variation (Load) | ΔI_{CCld} | $5\text{mA} \leq I_O \leq 1\text{A}$ | | | 0.5 | mA |
| Output Noise Voltage | V_{NO} | $10\text{Hz} \leq f \leq 100\text{kHz}^*$ | | 57 | | μV |
| Ripple Rejection | R_r | $f=120\text{Hz}$, $12\text{V} \leq V_{IN} \leq 22\text{V}$ | 56 | 72 | | dB |
| Dropout voltage | V_{drop} | $I_O=1\text{A}$ | | 2.0 | | V |
| Output Short Current | I_{OS} | $V_{IN}=35\text{V}$ | | 0.75 | | A |
| Peak Output Current | I_{OP} | | | 2.2 | | A |
| Output Voltage at Strobe Mode | $V_{O(ston)}$ | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 0.8 | V |
| Current Dissipation at Strobe Mode | $I_{CC(ston)}$ | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 3.0 | mA |
| Strobe Input Current | I_{st} | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 1.0 | mA |

[L780S10]

Recommended Operating Conditions at $T_a = 25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | Unit |
|----------------------|----------|------------|--------------|------|
| Input Voltage Range | V_{IN} | | 13.0 to 25.0 | V |
| Output Current Range | I_O | | 5 to 1000 | mA |

Operating Characteristics at $T_j = 25^\circ\text{C}$, $V_{IN}=17\text{V}$, $I_O=500\text{mA}$, $V_{st}=0\text{V}$, $*T_a = 25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|--------------------------------------|-------------------|--|---------|------|------|---------------|
| | | | min | typ | max | |
| Output Voltage1 | V_{O1} | | 9.6 | 10.0 | 10.4 | V |
| Line Regulation1 | ΔV_{O1n1} | $12.5\text{V} \leq V_{IN} \leq 28\text{V}$ | | 8 | 200 | mV |
| Line Regulation2 | ΔV_{O1n2} | $14\text{V} \leq V_{IN} \leq 20\text{V}$ | | 2.5 | 100 | mV |
| Load Regulation1 | ΔV_{O1d1} | $5\text{mA} \leq I_O \leq 1.5\text{A}$ | | | 200 | mV |
| Load Regulation2 | ΔV_{O1d2} | $250\text{mA} \leq I_O \leq 750\text{mA}$ | | | 100 | mV |
| Output Voltage2 | V_{O2} | $12.5\text{V} \leq V_{IN} \leq 25\text{V}$, $5\text{mA} \leq V_{IN} \leq 1\text{A}$ | 9.5 | | 10.5 | V |
| Current Dissipation | I_{CC} | | | | 8.0 | mA |
| Current Dissipation Variation (Line) | ΔI_{CCln} | $12.5\text{V} \leq V_{IN} \leq 25\text{V}$ | | | 1.0 | mA |
| Current Dissipation Variation (Load) | ΔI_{CCld} | $5\text{mA} \leq I_O \leq 1\text{A}$ | | | 0.5 | mA |
| Output Noise Voltage | V_{NO} | $10\text{Hz} \leq f \leq 100\text{kHz}^*$ | | 63 | | μV |
| Ripple Rejection | R_r | $f=120\text{Hz}$, $13\text{V} \leq V_{IN} \leq 23\text{V}$ | 55 | 72 | | dB |
| Dropout voltage | V_{drop} | $I_O=1\text{A}$ | | 2.0 | | V |
| Output Short Current | I_{OS} | $V_{IN}=35\text{V}$ | | 0.75 | | A |
| Peak Output Current | I_{OP} | | | 2.2 | | A |
| Output Voltage at Strobe Mode | $V_{O(ston)}$ | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 0.8 | V |
| Current Dissipation at Strobe Mode | $I_{CC(ston)}$ | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 3.0 | mA |
| Strobe Input Current | I_{st} | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 1.0 | mA |

L780S00 Series

[L780S12]

Recommended Operating Conditions at $T_a = 25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | Unit |
|----------------------|----------|------------|--------------|------|
| Input Voltage Range | V_{IN} | | 15.0 to 27.0 | V |
| Output Current Range | I_O | | 5 to 1000 | mA |

Operating Characteristics at $T_j = 25^\circ\text{C}$, $V_{IN}=19\text{V}$, $I_O=500\text{mA}$, $V_{st}=0\text{V}$, $*T_a = 25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|--------------------------------------|-------------------|--|---------|------|------|---------------|
| | | | min | typ | max | |
| Output Voltage1 | V_{O1} | | 11.5 | 12.0 | 12.5 | V |
| Line Regulation1 | ΔV_{O1n1} | $14.5\text{V} \leq V_{IN} \leq 30\text{V}$ | | 10 | 240 | mV |
| Line Regulation2 | ΔV_{O1n2} | $16\text{V} \leq V_{IN} \leq 22\text{V}$ | | 3 | 120 | mV |
| Load Regulation1 | ΔV_{O1d1} | $5\text{mA} \leq I_O \leq 1.5\text{A}$ | | | 240 | mV |
| Load Regulation2 | ΔV_{O1d2} | $250\text{mA} \leq I_O \leq 750\text{mA}$ | | | 120 | mV |
| Output Voltage2 | V_{O2} | $14.5\text{V} \leq V_{IN} \leq 27\text{V}$, $5\text{mA} \leq V_{IN} \leq 1\text{A}$ | 11.4 | | 12.6 | V |
| Current Dissipation | I_{CC} | | | | 8.0 | mA |
| Current Dissipation Variation (Line) | ΔI_{CCln} | $14.5\text{V} \leq V_{IN} \leq 30\text{V}$ | | | 1.0 | mA |
| Current Dissipation Variation (Load) | ΔI_{CCld} | $5\text{mA} \leq I_O \leq 1\text{A}$ | | | 0.5 | mA |
| Output Noise Voltage | V_{NO} | $10\text{Hz} \leq f \leq 100\text{kHz}^*$ | | 75 | | μV |
| Ripple Rejection | R_r | $f=120\text{Hz}$, $15\text{V} \leq V_{IN} \leq 25\text{V}$ | 55 | 71 | | dB |
| Dropout voltage | V_{drop} | $I_O=1\text{A}$ | | 2.0 | | V |
| Output Short Current | I_{OS} | $V_{IN}=35\text{V}$ | | 0.75 | | A |
| Peak Output Current | I_{OP} | | | 2.2 | | A |
| Output Voltage at Strobe Mode | $V_{O(ston)}$ | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 0.8 | V |
| Current Dissipation at Strobe Mode | $I_{CC(ston)}$ | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 3.0 | mA |
| Strobe Input Current | I_{st} | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 1.0 | mA |

[L780S15]

Recommended Operating Conditions at $T_a = 25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | Unit |
|----------------------|----------|------------|--------------|------|
| Input Voltage Range | V_{IN} | | 18.0 to 30.0 | V |
| Output Current Range | I_O | | 5 to 1000 | mA |

Operating Characteristics at $T_j = 25^\circ\text{C}$, $V_{IN}=23\text{V}$, $I_O=500\text{mA}$, $V_{st}=0\text{V}$, $*T_a = 25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|--------------------------------------|-------------------|--|---------|------|-------|---------------|
| | | | min | typ | max | |
| Output Voltage1 | V_{O1} | | 14.4 | 15.0 | 15.6 | V |
| Line Regulation1 | ΔV_{O1n1} | $17.5\text{V} \leq V_{IN} \leq 30\text{V}$ | | 11 | 300 | mV |
| Line Regulation2 | ΔV_{O1n2} | $20\text{V} \leq V_{IN} \leq 26\text{V}$ | | 3 | 150 | mV |
| Load Regulation1 | ΔV_{O1d1} | $5\text{mA} \leq I_O \leq 1.5\text{A}$ | | | 300 | mV |
| Load Regulation2 | ΔV_{O1d2} | $250\text{mA} \leq I_O \leq 750\text{mA}$ | | | 150 | mV |
| Output Voltage2 | V_{O2} | $17.5\text{V} \leq V_{IN} \leq 30\text{V}$, $5\text{mA} \leq V_{IN} \leq 1\text{A}$ | 14.25 | | 15.75 | V |
| Current Dissipation | I_{CC} | | | | 8.0 | mA |
| Current Dissipation Variation (Line) | ΔI_{CCln} | $17.5\text{V} \leq V_{IN} \leq 30\text{V}$ | | | 1.0 | mA |
| Current Dissipation Variation (Load) | ΔI_{CCld} | $5\text{mA} \leq I_O \leq 1\text{A}$ | | | 0.5 | mA |
| Output Noise Voltage | V_{NO} | $10\text{Hz} \leq f \leq 100\text{kHz}^*$ | | 90 | | μV |
| Ripple Rejection | R_r | $f=120\text{Hz}$, $18.5\text{V} \leq V_{IN} \leq 28.5\text{V}$ | 54 | 70 | | dB |
| Dropout voltage | V_{drop} | $I_O=1\text{A}$ | | 2.0 | | V |
| Output Short Current | I_{OS} | $V_{IN}=35\text{V}$ | | 0.75 | | A |
| Peak Output Current | I_{OP} | | | 2.2 | | A |
| Output Voltage at Strobe Mode | $V_{O(ston)}$ | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 0.8 | V |
| Current Dissipation at Strobe Mode | $I_{CC(ston)}$ | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 3.0 | mA |
| Strobe Input Current | I_{st} | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 1.0 | mA |

L780S00 Series

[L780S18]

Recommended Operating Conditions at $T_a = 25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | Unit |
|----------------------|----------|------------|--------------|------|
| Input Voltage Range | V_{IN} | | 21.0 to 33.0 | V |
| Output Current Range | I_O | | 5 to 1000 | mA |

Operating Characteristics at $T_j = 25^\circ\text{C}$, $V_{IN}=27\text{V}$, $I_O=500\text{mA}$, $V_{st}=0\text{V}$, $*T_a = 25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|--------------------------------------|-------------------|--|---------|------|------|---------------|
| | | | min | typ | max | |
| Output Voltage1 | V_{O1} | | 17.3 | 18.0 | 18.7 | V |
| Line Regulation1 | ΔV_{O1n1} | $21\text{V} \leq V_{IN} \leq 33\text{V}$ | | 15 | 360 | mV |
| Line Regulation2 | ΔV_{O1n2} | $24\text{V} \leq V_{IN} \leq 30\text{V}$ | | 5 | 180 | mV |
| Load Regulation1 | ΔV_{O1d1} | $5\text{mA} \leq I_O \leq 1.5\text{A}$ | | | 360 | mV |
| Load Regulation2 | ΔV_{O1d2} | $250\text{mA} \leq I_O \leq 750\text{mA}$ | | | 180 | mV |
| Output Voltage2 | V_{O2} | $21\text{V} \leq V_{IN} \leq 33\text{V}$, $5\text{mA} \leq V_{IN} \leq 1\text{A}$ | 17.1 | | 18.9 | V |
| Current Dissipation | I_{CC} | | | | 8.0 | mA |
| Current Dissipation Variation (Line) | ΔI_{CCln} | $21\text{V} \leq V_{IN} \leq 33\text{V}$ | | | 1.0 | mA |
| Current Dissipation Variation (Load) | ΔI_{CCld} | $5\text{mA} \leq I_O \leq 1\text{A}$ | | | 0.5 | mA |
| Output Noise Voltage | V_{NO} | $10\text{Hz} \leq f \leq 100\text{kHz}^*$ | | 110 | | μV |
| Ripple Rejection | R_r | $f=120\text{Hz}$, $22\text{V} \leq V_{IN} \leq 32\text{V}$ | 53 | 69 | | dB |
| Dropout voltage | V_{drop} | $I_O=1\text{A}$ | | 2.0 | | V |
| Output Short Current | I_{OS} | $V_{IN}=35\text{V}$ | | 0.75 | | A |
| Peak Output Current | I_{OP} | | | 2.2 | | A |
| Output Voltage at Strobe Mode | $V_{O(ston)}$ | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 0.8 | V |
| Current Dissipation at Strobe Mode | $I_{CC(ston)}$ | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 3.0 | mA |
| Strobe Input Current | I_{st} | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 1.0 | mA |

[L780S20]

Recommended Operating Conditions at $T_a = 25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | Unit |
|----------------------|----------|------------|--------------|------|
| Input Voltage Range | V_{IN} | | 23.0 to 35.0 | V |
| Output Current Range | I_O | | 5 to 1000 | mA |

Operating Characteristics at $T_j = 25^\circ\text{C}$, $V_{IN}=29\text{V}$, $I_O=500\text{mA}$, $V_{st}=0\text{V}$, $*T_a = 25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|--------------------------------------|-------------------|--|---------|------|------|---------------|
| | | | min | typ | max | |
| Output Voltage1 | V_{O1} | | 19.2 | 20.0 | 20.8 | V |
| Line Regulation1 | ΔV_{O1n1} | $23\text{V} \leq V_{IN} \leq 35\text{V}$ | | 15 | 400 | mV |
| Line Regulation2 | ΔV_{O1n2} | $26\text{V} \leq V_{IN} \leq 32\text{V}$ | | 5 | 200 | mV |
| Load Regulation1 | ΔV_{O1d1} | $5\text{mA} \leq I_O \leq 1.5\text{A}$ | | | 400 | mV |
| Load Regulation2 | ΔV_{O1d2} | $250\text{mA} \leq I_O \leq 750\text{mA}$ | | | 200 | mV |
| Output Voltage2 | V_{O2} | $24\text{V} \leq V_{IN} \leq 35\text{V}$, $5\text{mA} \leq V_{IN} \leq 1\text{A}$ | 19.0 | | 21.0 | V |
| Current Dissipation | I_{CC} | | | | 8.0 | mA |
| Current Dissipation Variation (Line) | ΔI_{CCln} | $23\text{V} \leq V_{IN} \leq 35\text{V}$ | | | 1.0 | mA |
| Current Dissipation Variation (Load) | ΔI_{CCld} | $5\text{mA} \leq I_O \leq 1\text{A}$ | | | 0.5 | mA |
| Output Noise Voltage | V_{NO} | $10\text{Hz} \leq f \leq 100\text{kHz}^*$ | | 110 | | μV |
| Ripple Rejection | R_r | $f=120\text{Hz}$, $24\text{V} \leq V_{IN} \leq 34\text{V}$ | 53 | 67 | | dB |
| Dropout voltage | V_{drop} | $I_O=1\text{A}$ | | 2.0 | | V |
| Output Short Current | I_{OS} | $V_{IN}=35\text{V}$ | | 0.75 | | A |
| Peak Output Current | I_{OP} | | | 2.2 | | A |
| Output Voltage at Strobe Mode | $V_{O(ston)}$ | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 0.8 | V |
| Current Dissipation at Strobe Mode | $I_{CC(ston)}$ | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 3.0 | mA |
| Strobe Input Current | I_{st} | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 1.0 | mA |

L780S00 Series

[L780S24]

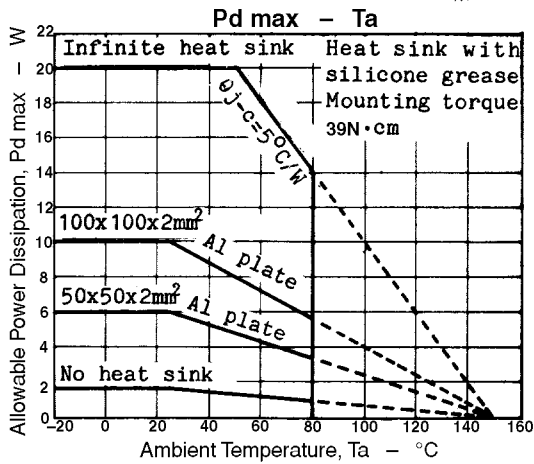
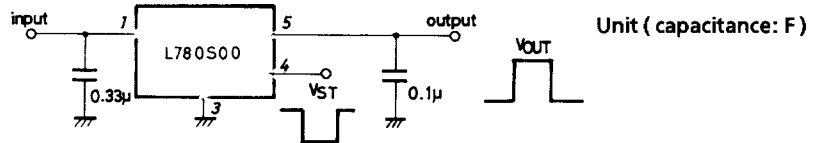
Recommended Operating Conditions at $T_a = 25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | Unit |
|----------------------|----------|------------|--------------|------|
| Input Voltage Range | V_{IN} | | 27.0 to 35.0 | V |
| Output Current Range | I_O | | 5 to 1000 | mA |

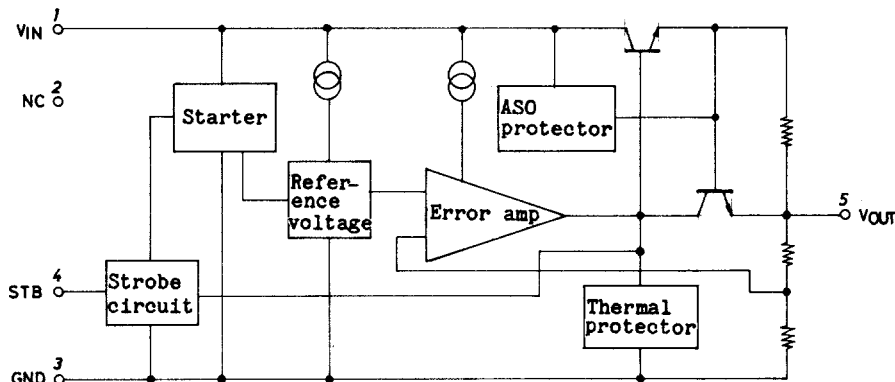
Operating Characteristics at $T_j = 25^\circ\text{C}$, $V_{IN}=33\text{V}$, $I_O=500\text{mA}$, $V_{st}=0\text{V}$, $*T_a = 25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|--------------------------------------|-------------------|--|---------|------|------|---------------|
| | | | min | typ | max | |
| Output Voltage1 | V_{O1} | | 23.0 | 24.0 | 25.0 | V |
| Line Regulation1 | ΔV_{O1n1} | $27\text{V} \leq V_{IN} \leq 35\text{V}$ | | 18 | 480 | mV |
| Line Regulation2 | ΔV_{O1n2} | $30\text{V} \leq V_{IN} \leq 35\text{V}$ | | 6 | 240 | mV |
| Load Regulation1 | ΔV_{O1d1} | $5\text{mA} \leq I_O \leq 1.5\text{A}$ | | | 480 | mV |
| Load Regulation2 | ΔV_{O1d2} | $250\text{mA} \leq I_O \leq 750\text{mA}$ | | | 240 | mV |
| Output Voltage2 | V_{O2} | $27\text{V} \leq V_{IN} \leq 35\text{V}$, $5\text{mA} \leq V_{IN} \leq 1\text{A}$ | 22.8 | | 25.2 | V |
| Current Dissipation | I_{CC} | | | | 8.0 | mA |
| Current Dissipation Variation (Line) | ΔI_{CCln} | $27\text{V} \leq V_{IN} \leq 35\text{V}$ | | | 1.0 | mA |
| Current Dissipation Variation (Load) | ΔI_{CCld} | $5\text{mA} \leq I_O \leq 1\text{A}$ | | | 0.5 | mA |
| Output Noise Voltage | V_{NO} | $10\text{Hz} \leq f \leq 100\text{kHz}^*$ | | 180 | | μV |
| Ripple Rejection | R_r | $f=120\text{Hz}$, $28\text{V} \leq V_{IN} \leq 34\text{V}$ | 50 | 66 | | dB |
| Dropout voltage | V_{drop} | $I_O=1\text{A}$ | | 2.0 | | V |
| Output Short Current | I_{OS} | $V_{IN}=35\text{V}$ | | 0.75 | | A |
| Peak Output Current | I_{OP} | | | 2.2 | | A |
| Output Voltage at Strobe Mode | $V_{O(ston)}$ | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 0.8 | V |
| Current Dissipation at Strobe Mode | $I_{CC(ston)}$ | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 3.0 | mA |
| Strobe Input Current | I_{st} | $V_{IN}=35\text{V}$, $V_{st}=5\text{V}$, $I_O=0$, * | | | 1.0 | mA |

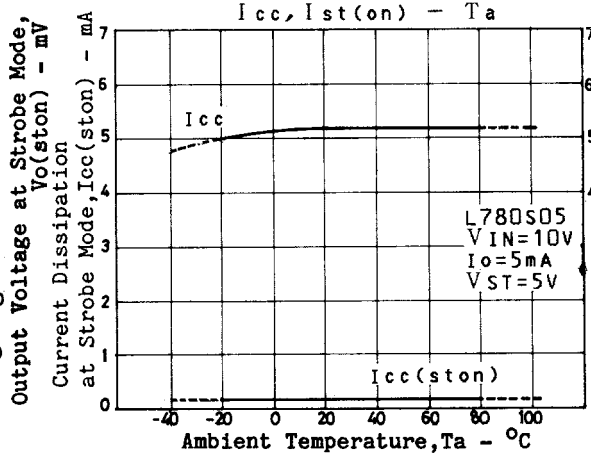
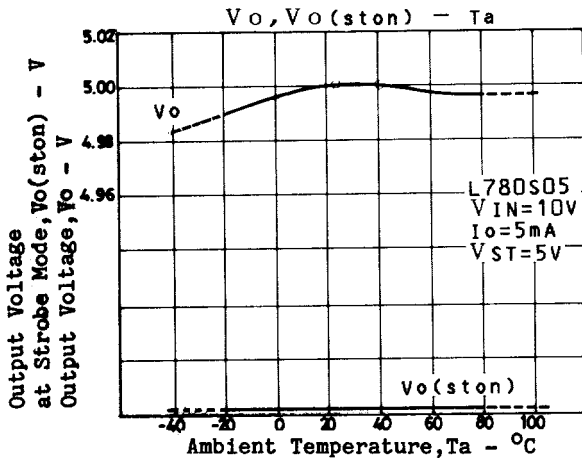
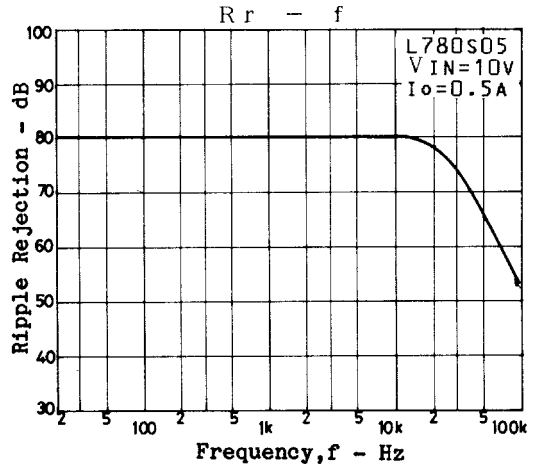
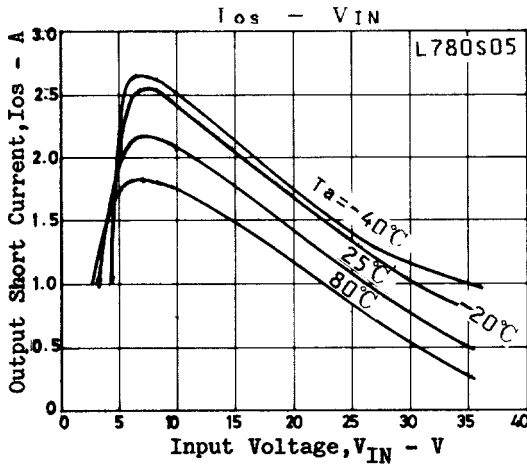
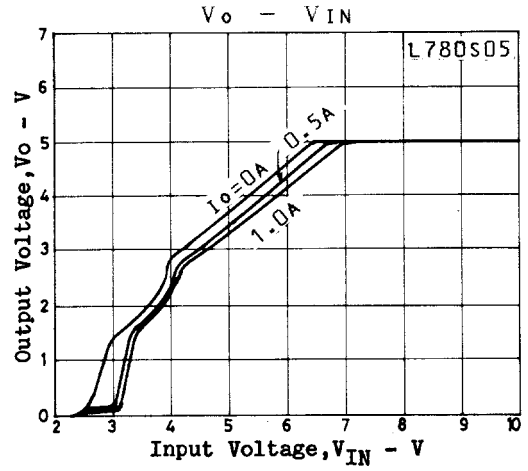
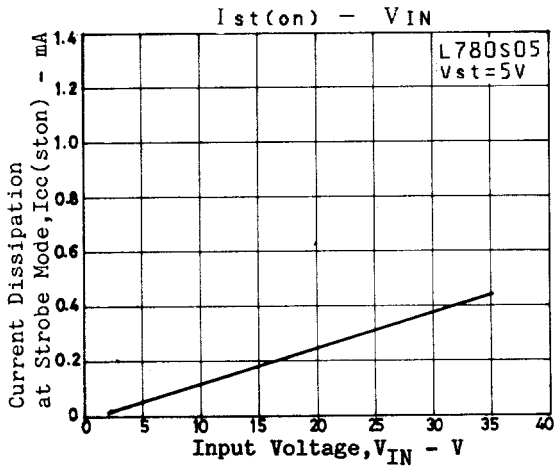
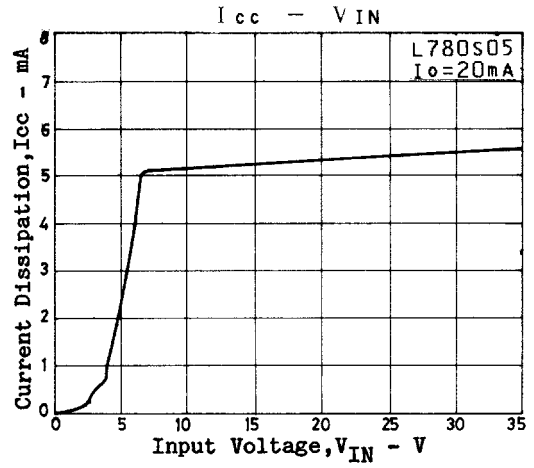
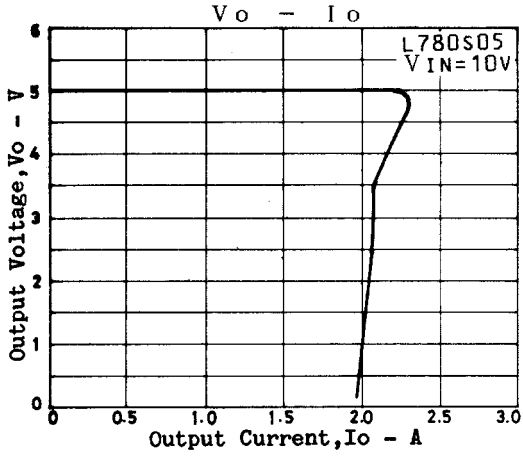
DC Characteristics Test Circuit (Common to L780S00 series)



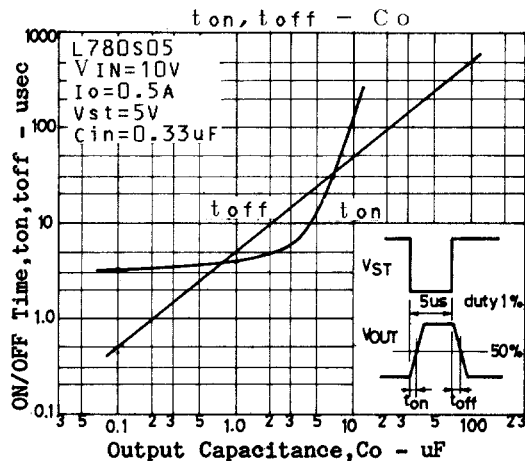
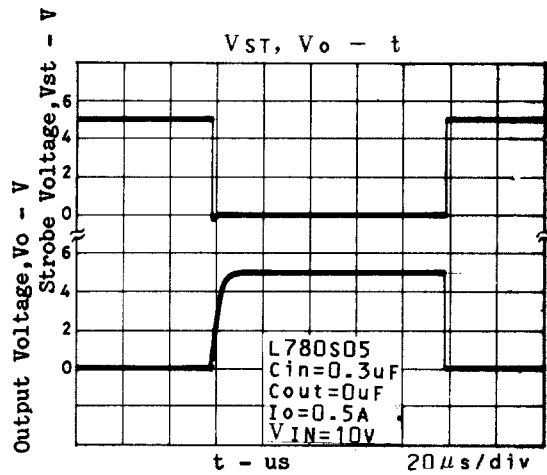
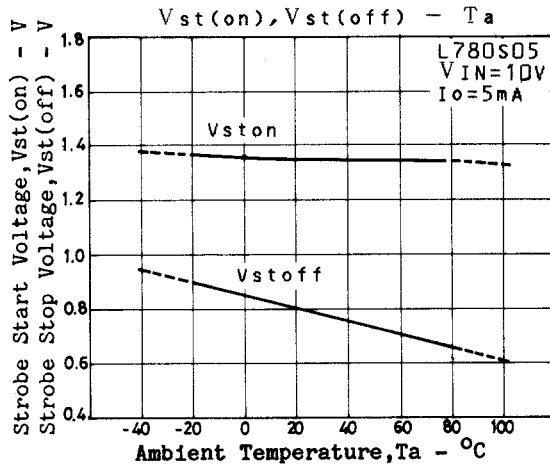
Equivalent Circuit Block Diagram



L780S00 Series



L780S00 Series



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