HA178M00 Series

3-terminal Fixed Voltage Regulators

HITACHI

Features

- Output current less than 500 mA
- Various output voltages: 5, 6, 7, 8, 9, 12, 15, 18, 20, and 24 V
- No external compensation circuit required
- Built-in current control circuit protects elements from destruction by short circuit
- Builting chip junction temperature limiting circuit protects elements from thermal destruction
- Builting internal power dissipation limiting circuit protects transistors in output stage

Ordering Information

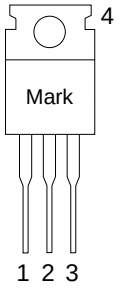
Type	Application	Package
HA178M00PJ Series	Automotive use	TO - 220AB
HA178M00P Series	Industrial use	
HA178M00 Series	Commercial use	

Output Voltage Accuracy Grade

Type No.	Grade	Accuracy
HA178M05	None	±4
HA178M12	A	±2
	B	±3
	C	+2, –4

Hitachi semiconductor

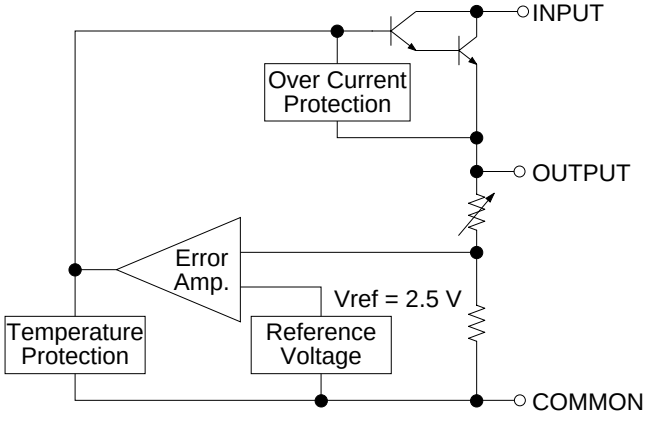
Pin Arrangement



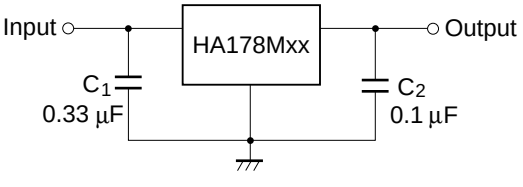
1. Input
2. Common
3. Output
4. Common

(Top View)

Block Diagram



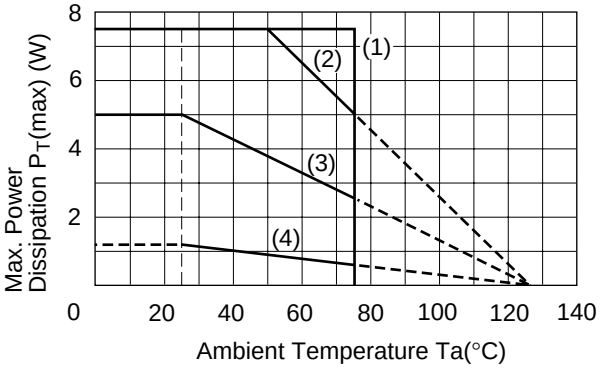
Standard Circuit



Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Rating	Unit	Notes
Input voltage	V_{IN}	35	V	1
Input voltage	V_{IN}	40	V	2
Power dissipation	P_T	7.5	W	3
Operating temperature	Topr	–20 to +75	°C	
Junction temperature	Tj	–20 to +125	°C	
Storage temperature	Tstg	–55 to +125	°C	

Notes: 1. For HA178M05P–HA178M18P, HA178M05–HA178M18
2. For HA178M20P, HA178M24P, HA178M20, HA178M24
3. Follow derating curve



(1) Infinite heat sink
(2) 5°C/W heat sink
(3) 15°C/W heat sink
(4) No heat sink
) Include fixed thermal resistance

Thermal resistance
θjc = 3.0°C/W (typ)
5.0°C/W (max)
θja = 62°C/W (typ)
72°C/W (max)

HA178M05P/PJ, HA178M05 Electrical Characteristics (V_{IN} = 10 V, I_{OUT} = 350 mA, 0°C Tj 125°C, C_{IN} = 0.33 µF, C_{OUT} = 0.1 µF, unless otherwise specified)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Output voltage	V_{OUT}	4.8	5.0	5.2	V	Tj = 25°C
		4.75	—	5.25		7 V ≤ V_{IN} ≤ 20 V, 5 mA ≤ I_{OUT} ≤ 350 mA, P_T ≤ 7.5 W
Line regulation	$\delta V_{O\ Line}$	—	3	100	mV	Tj = 25°C, 7 V ≤ V_{IN} ≤ 25 V, I_{OUT} = 200 mA
		—	1	50		8 V ≤ V_{IN} ≤ 25 V, I_{OUT} = 200 mA
Load regulation	$\delta V_{O\ Load}$	—	20	100	mV	Tj = 25°C, 5 mA ≤ I_{OUT} ≤ 500 mA
		—	10	50		5 mA ≤ I_{OUT} ≤ 200 mA
Quiescent current	I_Q	—	4.5	6.0	mA	Tj = 25°C, I_{OUT} = 0
Quiescent current change	δI_Q	—	—	0.8	mA	8 V ≤ V_{IN} ≤ 25 V, I_{OUT} = 200 mA
		—	—	0.5		5 mA ≤ I_{OUT} ≤ 350 mA
Output noise voltage	Vn	—	40	—	µV	Ta = 25°C, 10 Hz ≤ f ≤ 100 kHz
Ripple rejection ratio	R_{REJ}	—	80	—	dB	f = 120 Hz, I_{OUT} = 100 mA
		—	80	—		Tj = 25°C, I_{OUT} = 300 mA
Dropout voltage	Vdrop	—	2.0	—	V	I_{OUT} = 350 mA, Tj = 25°C
Output short-circuit current	I_{OS}	—	300	—	mA	Tj = 25°C, V_{IN} = 35 V
Peak output current	Io peak	—	700	—	mA	Tj = 25°C
Temperature coefficient of output voltage	$\delta V_{OUT}/\delta Tj$	—	–1.0	—	mV/°C	I_{OUT} = 5 mA, 0°C ≤ Tj ≤ 125°C

HA178M06P/PJ, HA178M06 Electrical Characteristics (V_{IN} = 11 V, I_{OUT} = 350 mA, 0˚C Tj 125˚C, C $_{IN}$ = 0.33 µF, C_{OUT} = 0.1 µF, unless otherwise specified)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Output voltage	V_{OUT}	5.75	6.0	6.25	V	Tj = 25°C
		5.7	—	6.3		8 V ≤ V_{IN} ≤ 21 V, 5 mA ≤ I_{OUT} ≤ 350 mA, P_T ≤ 7.5 W
Line regulation	$\delta V_{O\ Line}$	—	5	120	mV	Tj = 25°C — 8 V ≤ V_{IN} ≤ 25 V, I_{OUT} = 200 mA
		—	1.5	60		9 V ≤ V_{IN} ≤ 25 V, I_{OUT} = 200 mA
Load regulation	$\delta V_{O\ Load}$	—	20	120	mV	Tj = 25°C — 5 mA ≤ I_{OUT} ≤ 500 mA
		—	10	60		5 mA ≤ I_{OUT} ≤ 200 mA
Quiescent current	I_Q	—	4.5	6.0	mA	Tj = 25°C, I_{OUT} = 0
Quiescent current change	δI_Q	—	—	0.8	mA	9 V ≤ V_{IN} ≤ 25 V, I_{OUT} = 200 mA
		—	—	0.5		5 mA ≤ I_{OUT} ≤ 350 mA
Output noise voltage	Vn	—	45	—	µV	Ta = 25°C, 10 Hz ≤ f ≤ 100 kHz
Ripple rejection ratio	R_{REJ}	—	80	—	dB	f = 120 Hz — I_{OUT} = 100 mA
		—	80	—		Tj = 25°C — I_{OUT} = 300 mA
Dropout voltage	Vdrop	—	2.0	—	V	I_{OUT} = 350 mA, Tj = 25°C
Output short-circuit current	I_{OS}	—	270	—	mA	Tj = 25°C, V_{IN} = 35 V
Peak output current	Io peak	—	700	—	mA	Tj = 25°C
Temperature coefficient of output voltage	$\delta V_{OUT}/\delta Vj$	—	–0.5	—	mV/°C	I_{OUT} = 5 mA, 0°C ≤ Tj ≤ 125°C

HA178M07P/PJ, HA178M07 Electrical Characteristics (V_{IN} = 12.5 V, I_{OUT} = 350 mA, 0˚C Tj 125˚C, C $_{IN}$ = 0.33 µF, C_{OUT} = 0.1 µF, unless otherwise specified)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Output voltage	V_{OUT}	6.72	7.0	7.28	V	Tj = 25°C
		6.65	—	7.35		9 V ≤ V_{IN} ≤ 22 V, 5 mA ≤ I_{OUT} ≤ 350 mA, P_T ≤ 7.5 W
Line regulation	$\delta V_{O\ Line}$	—	5.5	140	mV	Tj = 25°C, 9 V ≤ V_{IN} ≤ 25 V, I_{OUT} = 200 mA
		—	1.7	70		10 V ≤ V_{IN} ≤ 25 V, I_{OUT} = 200 mA
Load regulation	$\delta V_{O\ Load}$	—	23	140	mV	Tj = 25°C, 5 mA ≤ I_{OUT} ≤ 500 mA
		—	10	70		5 mA ≤ I_{OUT} ≤ 200 mA
Quiescent current	I_Q	—	4.6	6.0	mA	Tj = 25°C, I_{OUT} = 0
Quiescent current change	δI_Q	—	—	0.8	mA	10 V ≤ V_{IN} ≤ 25 V, I_{OUT} = 200 mA
		—	—	0.5		5 mA ≤ I_{OUT} ≤ 350 mA
Output noise voltage	Vn	—	48.5	—	µV	Ta = 25°C, 10 Hz ≤ f ≤ 100 kHz
Ripple rejection ratio	R_{REJ}	—	80	—	dB	f = 120 Hz, I_{OUT} = 100 mA
		—	80	—		Tj = 25°C, I_{OUT} = 300 mA
Dropout voltage	Vdrop	—	2.0	—	V	I_{OUT} = 350 mA, Tj = 25°C
Output short-circuit current	I_{OS}	—	260	—	mA	Tj = 25°C, V_{IN} = 35 V
Peak output current	Io peak	—	700	—	mA	Tj = 25°C
Temperature coefficient of output voltage	$\delta V_{OUT}/\delta Tj$	—	–0.5	—	mV/°C	I_{OUT} = 5 mA, 0°C ≤ Tj ≤ 125°C

HA178M08P/PJ, HA178M08 Electrical Characteristics (V_{IN} = 14 V, I_{OUT} = 350 mA, 0°C Tj 125°C, C_{IN} = 0.33 µF, C_{OUT} = 0.1 µF, unless otherwise specified)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Output voltage	V_{OUT}	7.7	8.0	8.3	V	Tj = 25°C
		7.6	—	8.4		10.5 V ≤ V_{IN} ≤ 23 V, 5 mA ≤ I_{OUT} ≤ 350 mA, P_T ≤ 7.5 W
Line regulation	$\delta V_{O\ Line}$	—	6.0	160	mV	Tj = 25°C, 10.5 V ≤ V_{IN} ≤ 25 V, I_{OUT} = 200 mA
		—	2.0	80		11 V ≤ V_{IN} ≤ 25 V, I_{OUT} = 200 mA
Load regulation	$\delta V_{O\ Load}$	—	25	160	mV	Tj = 25°C, 5 mA ≤ I_{OUT} ≤ 500 mA
		—	10	80		5 mA ≤ I_{OUT} ≤ 200 mA
Quiescent current	I_Q	—	4.6	6.0	mA	Tj = 25°C, I_{OUT} = 0
Quiescent current change	δI_Q	—	—	0.8	mA	10.5 V ≤ V_{IN} ≤ 25 V, I_{OUT} = 200 mA
		—	—	0.5		5 mA ≤ I_{OUT} ≤ 350 mA
Output noise voltage	Vn	—	52	—	µV	Ta = 25°C, 10 Hz ≤ f ≤ 100 kHz
Ripple rejection ratio	R_{REJ}	—	80	—	dB	f = 120 Hz, I_{OUT} = 100 mA
		—	80	—		Tj = 25°C, I_{OUT} = 300 mA
Dropout voltage	Vdrop	—	2.0	—	V	I_{OUT} = 350 mA, Tj = 25°C
Output short-circuit current	I_{OS}	—	250	—	mA	Tj = 25°C, V_{IN} = 35 V
Peak output current	Io peak	—	700	—	mA	Tj = 25°C
Temperature coefficient of output voltage	$\delta V_{OUT}/\delta Tj$	—	–0.5	—	mV/°C	I_{OUT} = 5 mA, 0°C ≤ Tj ≤ 125°C

HA178M09P/PJ, HA178M09 Electrical Characteristics (V_{IN} = 15 V, I_{OUT} = 350 mA, 0°C Tj 125°C, C_{IN} = 0.33 µF, C_{OUT} = 0.1 µF, unless otherwise specified)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Output voltage	V_{OUT}	8.64	9.0	9.36	V	Tj = 25°C
		8.55	—	9.45		11.5 V ≤ V_{IN} ≤ 24 V, 5 mA ≤ I_{OUT} ≤ 350 mA, P_T ≤ 7.5 W
Line regulation	$\delta V_{O\ Line}$	—	7.0	180	mV	Tj = 25°C, 11.5 V ≤ V_{IN} ≤ 25 V, I_{OUT} = 200 mA
		—	2.5	90		12 V ≤ V_{IN} ≤ 25 V, I_{OUT} = 200 mA
Load regulation	$\delta V_{O\ Load}$	—	25	200	mV	Tj = 25°C, 5 mA ≤ I_{OUT} ≤ 500 mA
		—	10	100		5 mA ≤ I_{OUT} ≤ 200 mA
Quiescent current	I_Q	—	4.6	6.0	mA	Tj = 25°C, I_{OUT} = 0
Quiescent current change	δI_Q	—	—	0.8	mA	12 V ≤ V_{IN} ≤ 25 V, I_{OUT} = 200 mA
		—	—	0.5		5 mA ≤ I_{OUT} ≤ 350 mA
Output noise voltage	Vn	—	52	—	µV	Ta = 25°C, 10 Hz ≤ f ≤ 100 kHz
Ripple rejection ratio	R_{REJ}	—	80	—	dB	f = 120 Hz, I_{OUT} = 100 mA
		—	80	—		Tj = 25°C, I_{OUT} = 300 mA
Dropout voltage	Vdrop	—	2.0	—	V	I_{OUT} = 350 mA, Tj = 25°C
Output short-circuit current	I_{OS}	—	250	—	mA	Tj = 25°C, V_{IN} = 35 V
Peak output current	Io peak	—	700	—	mA	Tj = 25°C
Temperature coefficient of output voltage	$\delta V_{OUT}/\delta Tj$	—	–0.9	—	mV/°C	I_{OUT} = 5 mA, 0°C ≤ Tj ≤ 125°C

HA178M12P/PJ, HA178M12 Electrical Characteristics (V_{IN} = 19 V, I_{OUT}= = 350 mA, 0°C Tj 125°C, C_{IN} = 0.33 µF, C_{OUT} = 0.1 µF, unless otherwise specified)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Output voltage	V_{OUT}	11.5	12.0	12.5	V	Tj = 25°C
		11.4	—	12.6		14.5 V ≤ V_{IN} ≤ 27 V, 5 mA ≤ I_{OUT} ≤ 350 mA, PT ≤ 7.5 W
Line regulation	$\delta V_{O\ Line}$	—	10	240	mV	Tj = 25°C, 14.5 V ≤ V_{IN} ≤ 30 V, I_{OUT} = 200 mA
		—	3.0	120		16 V ≤ V_{IN} ≤ 30 V, I_{OUT} = 200 mA
Load regulation	$\delta V_{O\ Load}$	—	25	240	mV	Tj = 25°C, 5 mA ≤ I_{OUT} ≤ 500 mA
		—	10	120		5 mA ≤ I_{OUT} ≤ 200 mA
Quiescent current	I_Q	—	4.8	6.0	mA	Tj = 25°C, I_{OUT} = 0
Quiescent current change	δI_Q	—	—	0.8	mA	14.5 V ≤ V_{IN} ≤ 30 V, I_{OUT} = 200 mA
		—	—	0.5		5 mA ≤ I_{OUT} ≤ 350 mA
Output noise voltage	Vn	—	75	—	µV	Ta = 25°C, 10 Hz ≤ f ≤ 100 kHz
Ripple rejection ratio	R_{REJ}	—	80	—	dB	f = 120 Hz, I_{OUT} = 100 mA
		—	80	—		Tj = 25°C, I_{OUT} = 300 mA
Dropout voltage	Vdrop	—	2.0	—	V	I_{OUT} = 350 mA, Tj = 25°C
Output short-circuit current	I_{OS}	—	240	—	mA	Tj = 25°C, V_{IN} = 35 V
Peak output curren	Io peak	—	700	—	mA	Tj = 25°C
Temperature coefficient of output voltage	$\delta V_{OUT}/\delta Tj$	—	–1.0	—	mV/°C	I_{OUT} = 5 mA, 0°C ≤ Tj ≤ 125°C

HA178M15P/PJ, HA178M15 Electrical Characteristics (V_{IN} = 23 V, I_{OUT} = 350 mA, 0°C Tj 125°C, C_{IN} = 0.33 µF, C_{OUT} = 0.1 µF, unless otherwise specified)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Output voltage	V_{OUT}	14.4	15.0	15.6	V	Tj = 25°C
		14.25	—	15.75		17.5 V ≤ V_{IN} ≤ 30 V, 5 mA ≤ I_{OUT} ≤ 350 mA, P_T ≤ 7.5 W
Line regulation	$\delta V_{O\ Line}$	—	11	300	mV	Tj = 25°C, 17.5 V ≤ V_{IN} ≤ 30 V, I_{OUT} = 200 mA
		—	3.0	150		20 V ≤ V_{IN} ≤ 30 V, I_{OUT} = 200 mA
Load regulation	$\delta V_{O\ Load}$	—	25	300	mV	Tj = 25°C, 5 mA ≤ I_{OUT} ≤ 500 mA
		—	10	150		5 mA ≤ I_{OUT} ≤ 200 mA
Quiescent current	I_Q	—	4.8	6.0	mA	Tj = 25°C, I_{OUT} = 0
Quiescent current change	δI_Q	—	—	0.8	mA	17.5 V ≤ V_{IN} ≤ 30 V, I_{OUT} = 200 mA
		—	—	0.5		5 mA ≤ I_{OUT} ≤ 350 mA
Output noise voltage	Vn	—	90	—	µV	Ta = 25°C, 10 Hz ≤ f ≤ 100 kHz
Ripple rejection ratio	R_{REJ}	—	70	—	dB	f = 120 Hz, I_{OUT} = 100 mA
		—	70	—		Tj = 25°C, I_{OUT} = 300 mA
Dropout voltage	Vdrop	—	2.0	—	V	I_{OUT} = 350 mA, Tj = 25°C
Output short-circuit current	I_{OS}	—	240	—	mA	Tj = 25°C, V_{IN} = 35 V
Peak output current	Io peak	—	700	—	mA	Tj = 25°C
Temperature coefficient of output voltage	$\delta V_{OUT}/\delta Tj$	—	–1.0	—	mV/°C	I_{OUT} = 5 mA, 0°C ≤ Tj ≤ 125°C

HA178M18P/PJ, HA178M18 Electrical Characteristics (V_{IN} = 27 V, I_{OUT} = 350 mA, 0°C Tj 125°C, C_{IN} = 0.33 µF, C_{OUT} = 0.1 µF, unless otherwise specified)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Output voltage	V_{OUT}	17.3	18.0	18.7	V	Tj = 25°C
		17.1	—	18.9		21 V ≤ V_{IN} ≤ 33 V, 5 mA ≤ I_{OUT} ≤ 350 mA, P_T ≤ 7.5 W
Line regulation	$dV_{O\ Line}$	—	15	360	mV	Tj = 25°C, 21 V ≤ V_{IN} ≤ 33 V, I_{OUT} = 200 mA
		—	5.0	180		24 V ≤ V_{IN} ≤ 33 V, I_{OUT} = 200 mA
Load regulation	$\delta V_{O\ Load}$	—	25	360	mV	Tj = 25°C, 5 mA ≤ I_{OUT} ≤ 500 mA
		—	10	180		5 mA ≤ I_{OUT} ≤ 200 mA
Quiescent current	I_Q	—	4.8	6.0	mA	Tj = 25°C, I_{OUT} = 0
Quiescent current change	δI_Q	—	—	0.8	mA	21 V ≤ V_{IN} ≤ 35 V, I_{OUT} = 200 mA
		—	—	0.5		5 mA ≤ I_{OUT} ≤ 350 mA
Output noise voltage	Vn	—	110	—	µV	Ta = 25°C, 10 Hz ≤ f ≤ 100 kHz
Ripple rejection ratio	R_{REJ}	—	70	—	dB	f = 120 Hz, I_{OUT} = 100 mA
		—	70	—		Tj = 25°C, I_{OUT} = 300 mA
Dropout voltage	Vdrop	—	2.0	—	V	I_{OUT} = 350 mA, Tj = 25°C
Output short-circuit current	I_{OS}	—	240	—	mA	Tj = 25°C, V_{IN} = 35 V
Peak output current	Io peak	—	700	—	mA	Tj = 25°C
Temperature coefficient of output voltage	$\delta V_{OUT}/\delta Tj$	—	–1.0	—	mV/°C	I_{OUT} = 5 mA, 0°C ≤ Tj ≤ 125°C

HA178M20P/PJ, HA178M20 Electrical Characteristics (V_{IN} = 29 V, I_{OUT} = 350 mA, 0°C Tj 125°C, C_{IN} = 0.33 µF, C_{OUT} = 0.1 µF, unless otherwise specified)

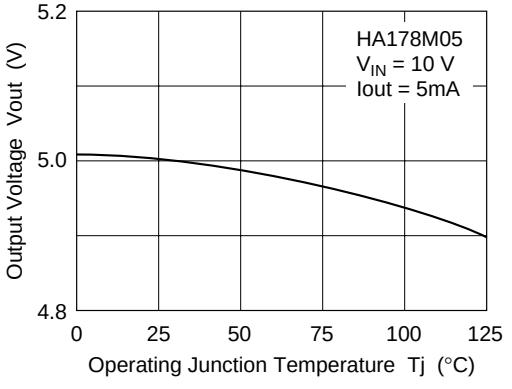
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Output voltage	V_{OUT}	19.2	20	20.8	V	Tj = 25°C
		19	—	21		23 V ≤ V_{IN} ≤ 35 V, 5 mA ≤ I_{OUT} ≤ 350 mA, P_T ≤ 7.5 W
Line regulation	$\delta V_{O\ Line}$	—	17	400	mV	Tj = 25°C, 23 V ≤ V_{IN} ≤ 35 V, I_{OUT} = 200 mA
		—	6.0	200		24 V ≤ V_{IN} ≤ 35 V, I_{OUT} = 200 mA
Load regulation	$\delta V_{O\ Load}$	—	30	400	mV	Tj = 25°C, 5 mA ≤ I_{OUT} ≤ 500 mA
		—	10	200		5 mA ≤ I_{OUT} ≤ 200 mA
Quiescent current	I_Q	—	4.9	6.0	mA	Tj = 25°C, I_{OUT} = 0
Quiescent current change	δI_Q	—	—	0.8	mA	23 V ≤ V_{IN} ≤ 35 V, I_{OUT} = 200 mA
		—	—	0.5		5 mA ≤ I_{OUT} ≤ 350 mA
Output noise voltage	Vn	—	110	—	µV	Ta = 25°C, 10 Hz ≤ f ≤ 100 kHz
Ripple rejection ratio	R_{REJ}	—	70	—	dB	f = 120 Hz, I_{OUT} = 100 mA
		—	70	—		Tj = 25°C, I_{OUT} = 300 mA
Dropout voltage	Vdrop	—	2.0	—	V	I_{OUT} = 350 mA, Tj = 25°C
Output short-circuit current	I_{OS}	—	240	—	mA	Tj = 25°C, V_{IN} = 35 V
Peak output current	Io peak	—	700	—	mA	Tj = 25°C
Temperature coefficient of output voltage	$\delta V_{OUT}/\delta Tj$	—	–1.1	—	mV/°C	I_{OUT} = 5 mA, 0°C ≤ Tj ≤ 125°C

HA178M24P/PJ, HA178M24 Electrical Characteristics (V_{IN} = 33 V, I_{OUT} = 350 mA, 0°C Tj 125°C, C_{IN} = 0.33 µF, C_{OUT} = 0.1 µF, unless otherwise specified)

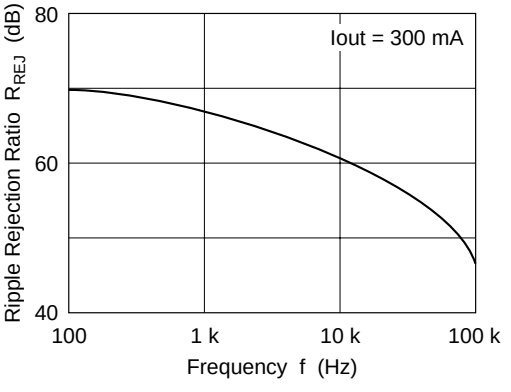
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Output voltage	V_{OUT}	23.0	24.0	25.0	V	Tj = 25°C
		22.8	—	25.2		27 V ≤ V_{IN} ≤ 38 V,
						5 mA ≤ I_{OUT} ≤ 350 mA, P_T ≤ 7.5 W
Line regulation	$\delta V_{O\ Line}$	—	18	480	mV	Tj = 25°C, 27 V ≤ V_{IN} ≤ 38 V, I_{OUT} = 200 mA
		—	6.0	240		28 V ≤ V_{IN} ≤ 38 V, I_{OUT} = 200 mA
Load regulation	$\delta V_{O\ Load}$	—	30	480	mV	Tj = 25°C, 5 mA ≤ I_{OUT} ≤ 500 mA
		—	10	240		5 mA ≤ I_{OUT} ≤ 200 mA
Quiescent current	I_Q	—	5.0	8.0	mA	Tj = 25°C, I_{OUT} = 0
Quiescent current change	δI_Q	—	—	0.8	mA	27 V ≤ V_{IN} ≤ 38 V, I_{OUT} = 200 mA
		—	—	0.5		5 mA ≤ I_{OUT} ≤ 350 mA
Output noise voltage	Vn	—	170	—	µV	Ta = 25°C, 10 Hz ≤ f ≤ 100 kHz
Ripple rejection ratio	R_{REJ}	—	70	—	dB	f = 120 Hz, I_{OUT} = 100 mA
		—	70	—		Tj = 25°C, I_{OUT} = 300 mA
Dropout voltage	Vdrop	—	2.0	—	V	I_{OUT} = 350 mA, Tj = 25°C
Output short-circuit current	I_{OS}	—	240	—	mA	Tj = 25°C, V_{IN} = 35 V
Peak output current	Io peak	—	700	—	mA	Tj = 25°C
Temperature coefficient of output voltage	$\delta V_{OUT}/\delta Tj$	—	–1.2	—	mV/°C	I_{OUT} = 5 mA, 0°C ≤ Tj ≤ 125°C

Characteristic Curves

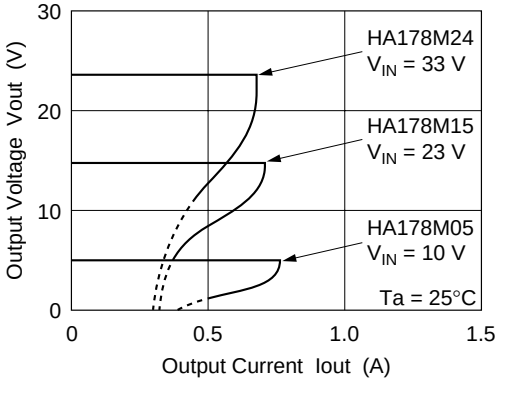
Output Voltage vs. Operating Junction Temperature (1)



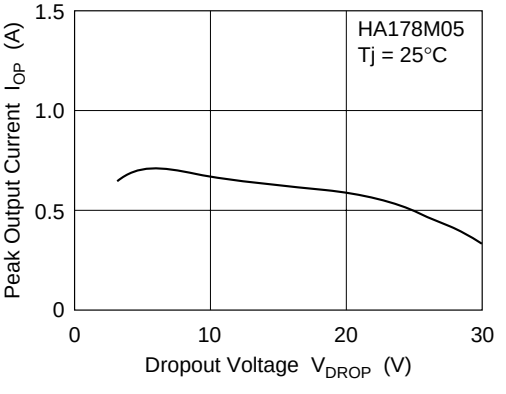
Ripple Rejection Ratio vs. Frequency



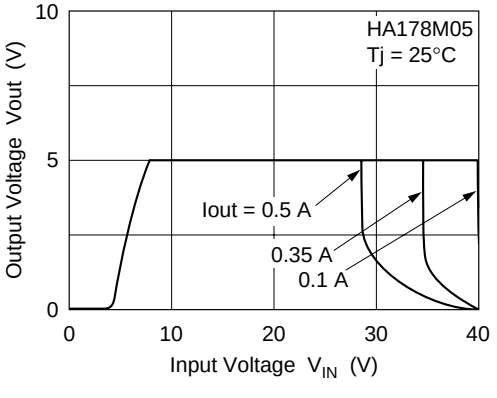
Output Voltage vs. Output Current



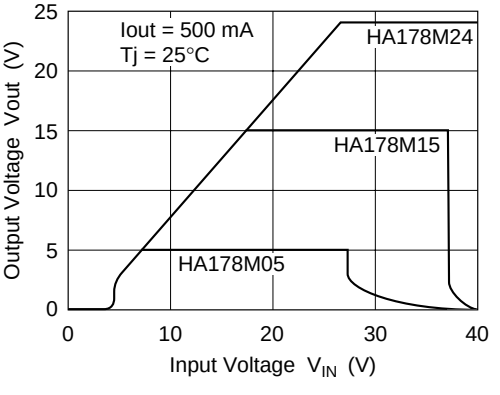
Peak Output Current vs. Dropout Voltage



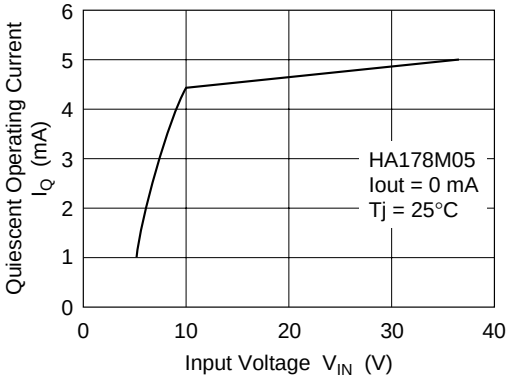
Output Voltage vs. Input Voltage (1)



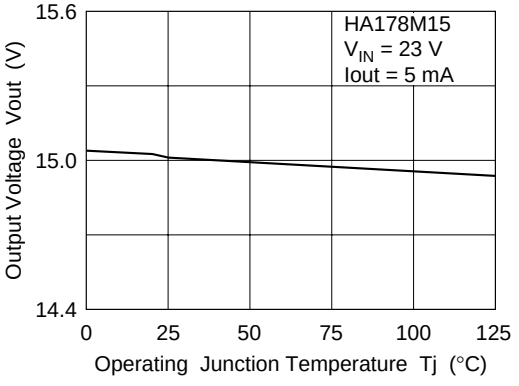
Output Voltage vs. Input Voltage (2)



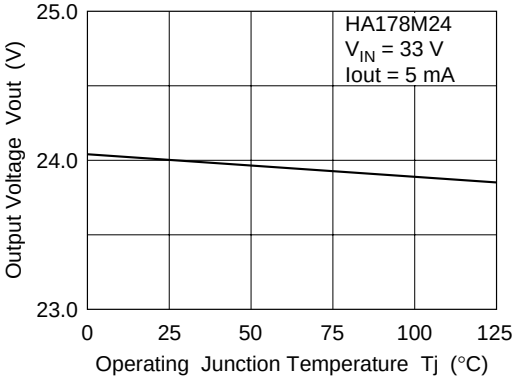
Quiescent Operating Current vs. Input Voltage



Output Voltage vs. Operating Junction Temperature (2)

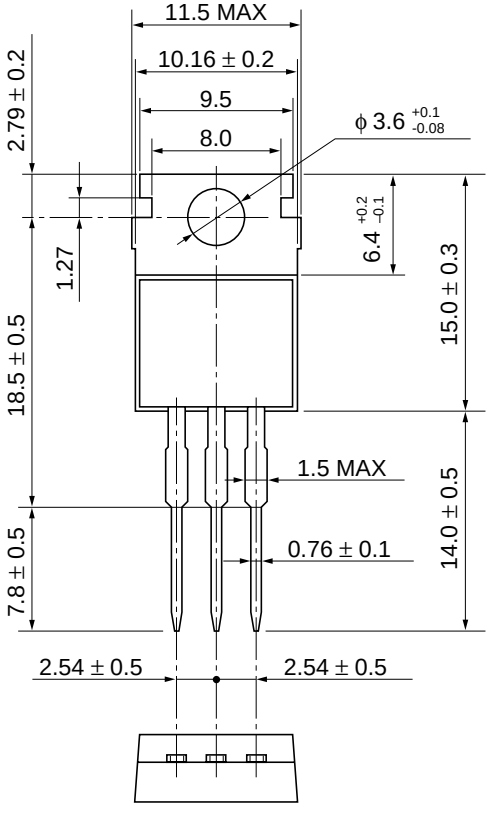


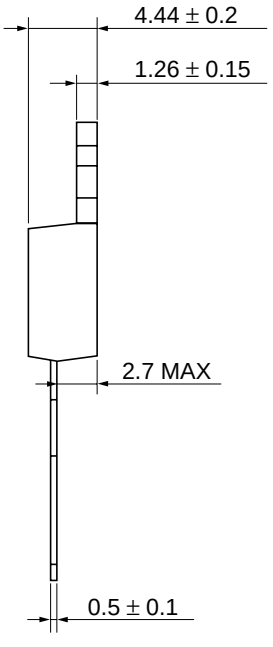
Output Voltage vs. Operating Junction Temperature (3)

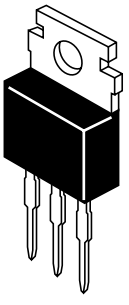


Package Dimensions

Unit: mm







Hitachi Code	TO-220AB
JEDEC	Conforms
EIAJ	Conforms
Mass (reference value)	1.8 g

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HITACHI

Hitachi, Ltd.
Semiconductor & Integrated Circuits.
Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan
Tel: Tokyo (03) 3270-2111 Fax: (03) 3270-5109

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For further information write to:

Hitachi Semiconductor
(America) Inc.
179 East Tasman Drive,
San Jose,CA 95134
Tel: <1> (408) 433-1990
Fax: <1>(408) 433-0223

Hitachi Europe GmbH
Electronic components Group
Dornacher Straβe 3
D-85622 Feldkirchen, Munich
Germany
Tel: <49> (89) 9 9180-0
Fax: <49> (89) 9 29 30 00

Hitachi Europe Ltd.
Electronic Components Group.
Whitebrook Park
Lower Cookham Road
Maidenhead
Berkshire SL6 8YA, United Kingdom
Tel: <44> (1628) 585000
Fax: <44> (1628) 778322

Hitachi Asia Pte. Ltd.
16 Collyer Quay #20-00
Hitachi Tower
Singapore 049318
Tel: 535-2100
Fax: 535-1533

Hitachi Asia Ltd.
Taipei Branch Office
3F, Hung Kuo Building. No.167,
Tun-Hwa North Road, Taipei (105)
Tel: <886> (2) 2718-3666
Fax: <886> (2) 2718-8180

Hitachi Asia (Hong Kong) Ltd.
Group III (Electronic Components)
7/F., North Tower, World Finance Centre,
Harbour City, Canton Road, Tsim Sha Tsui,
Kowloon, Hong Kong
Tel: <852> (2) 735 9218
Fax: <852> (2) 730 0281
Telex: 40815 HITEC HX