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KA7552A/KA7553A

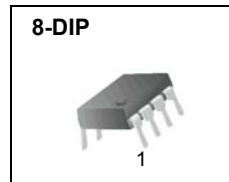
SMPS Controller

Features

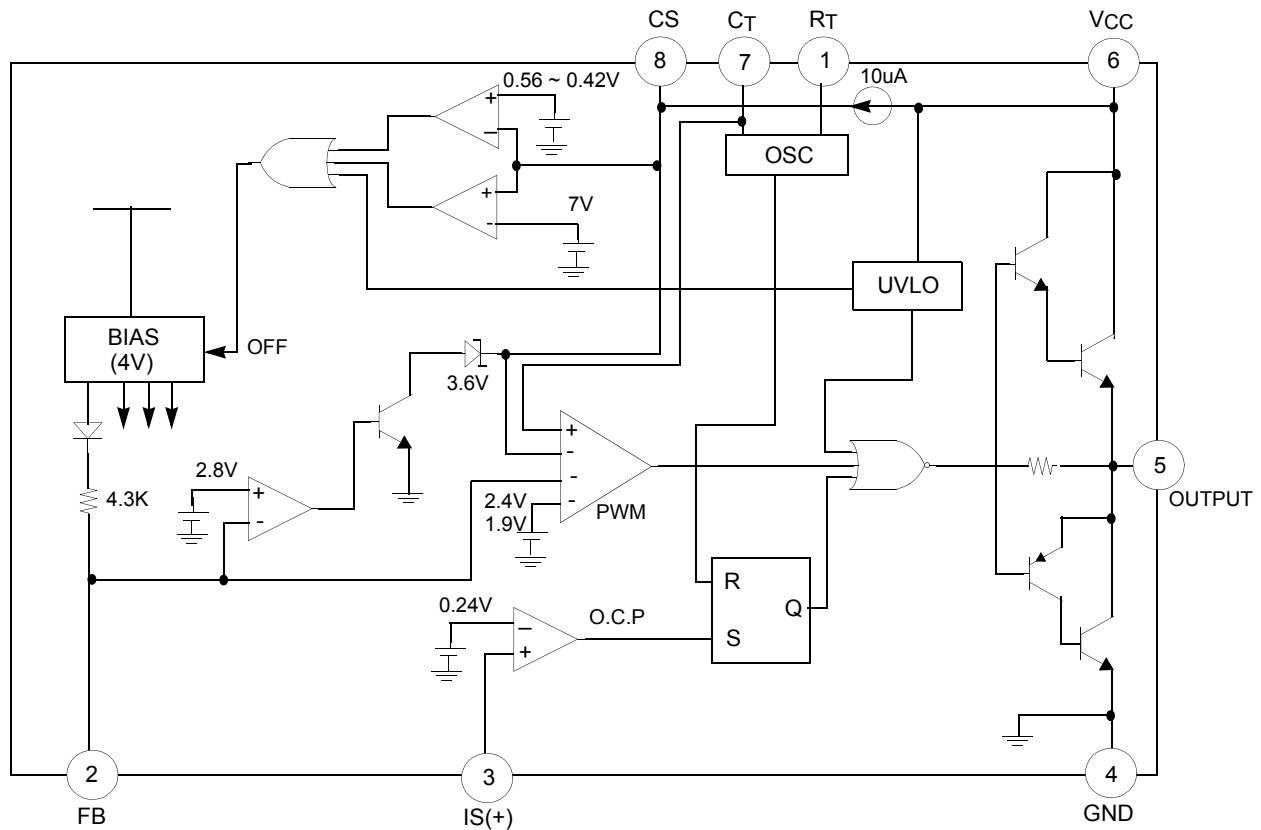
- Built-in drive circuits for direct connection power MOSFET ($I_O = \pm 1.5A$)
- Wide operating frequency range (5kHz ~ 600kHz)
- Pulse by pulse over current limiting
- Over load protection
- On/off control by external trigger
- Internal UVLO
- Low standby current (typ. 90uA)
- Soft start circuit

Description

The KA7552A/KA7553A are switching power control IC for wide operating frequency range. The internal circuits include pulse by pulse current limiting, protection, on/off control by external trigger, low standby current, soft start, and high current totempole output for driving a POWER MOSFET. Maximum duty of the KA7552A is 70% and the KA7553A is 46%. When duty is maximum, the input threshold voltage of pin2 & pin8 are not same in KA7552A and KA7553A.



Internal Block Diagram



Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Supply voltage	V _{CC}	30	V
Output current	I _O	±1.5	A
Input voltage at overcurrent detection pin	V _{IN(IS)}	-0.3 to 4	V
Input voltage at FB pin	V _{IN(FB)}	4	V
Input current at CS pin	I _{IN(CS)}	2	mA
Total power dissipation (T _a = 25°C)	P _D	800	mW
Operating temperature	T _{OPR}	-25 to 85	°C
Storage temperature range	T _{STG}	-65 to 150	°C
Junction temperature	T _J	+125	°C

Electrical Characteristics

(V_{CC} = 18V, F_{OSC} = 135kHz, T_A = 25°C, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
OSCILLATOR SECTION						
Initial accuracy	F _{OSC}	C _T = 360pF, T _J = 25°C	125	135	145	kHz
Frequency variation 1	ΔF/ΔV	V _{CC} = 10V to 30V	-	±1	±3	%
Frequency variation 2 ^(Note1)	ΔF/ΔV	T _A = 25°C to 85°C	-	±1.5	-	%
Ramp high voltage	V _{RH}	C _T = 360pF, T _J = 25°C	2.80	3.08	3.30	V
Ramp low voltage	V _{RL}	C _T = 360pF, T _J = 25°C	0.6	0.9	1.2	V
Amplitude	V _{OSC}	V _{PIN7} , peak to peak	1.80	2.18	2.50	V
PULSE WIDTH MODULATION SECTION						
Input threshold voltage(pin2)	V _{TH(FBD)}	Duty cycle = 0%	0.6	0.75	0.95	V
Input threshold voltage(pin2) ^(Note1)	V _{TH(FB1)} (KA7552)	Duty cycle = D _{max} 1	2.1	2.3	2.6	V
	V _{TH(FB2)} (KA7553)	Duty cycle = D _{max} 2	1.6	1.8	2.1	V
Max. duty cycle	D _(Max1) (KA7552)	-	66	70	74	%
	D _(Max2) (KA7553)	-	43	46	49	%
Source current(pin2)	I _{SOURCE(FB)}	V _{PIN2} = 0V	-660	-800	-960	uA
OVERCURRENT LIMIT SECTION						
Input threshold voltage	V _{TH(IS)}	-	0.21	0.24	0.27	V
Source current(pin3)	I _{SOURCE(IS)}	V _{PIN3} = 0V	-300	-200	-100	uA
Deley time ^(Note1)	T _D	-	-	150	-	ns
SOFT START SECTION						
Charging current	I _{CHG}	V _{PIN8} = 0V	-15	-10	-5	uA
Input threshold voltage(pin8)	V _{TH(CSO)}	-	0.7	0.9	1.1	V
Input threshold voltage(pin8) ^(Note1)	V _{TH(CS1)} (KA7552)	Duty cycle = D _{max} 1	2.2	2.4	2.6	V
	V _{TH(CS2)} (KA7553)	Duty cycle = D _{max} 2	1.7	1.9	2.1	V
LATCH MODE SHUTDOWN CIRCUIT SECTION						
Sink current(pin8)	I _{SINK(CS)}	V _{PIN8} = 6V, V _{PIN2} = 1V	25	45	65	uA
Shutdown threshold voltage	V _{TH(SD,CS)}	-	6.7	7.2	7.7	V
OVERLOAD SHUTDOWN SECTION						
Shutdown threshold voltage	V _{TH(SD,FB)}	-	2.6	2.8	3.1	V

Electrical Characteristics (Continued)(V_{CC} = 18V, F_{OSC} = 135kHz, T_A = 25°C, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
UNDER VOLTAGE LOCKOUT SECTION						
Start-up threshold voltage	V _{TH(ST)}	-	15.5	16.0	16.5	V
Minimum operating voltage	V _{OPR(Min)}	-	8.20	8.70	9.20	V
Hysteresis	V _{HYS}	-	6.40	7.30	8.20	V
ON/OFF CONTROL SECTION						
Source current(pin8)	I _{SOURCE(CS)}	V _{PIN8} = 0V	-15	-10	-5	uA
On threshold voltage	V _{TH(ON)}	V _{PIN8} : OFF->ON	0.45	0.56	0.70	V
Off threshold voltage	V _{TH(OFF)}	V _{PIN8} : ON -> OFF	0.30	0.42	0.55	V
OUTPUT SECTION						
Low output voltage	V _{OL}	I _O = 100mA, V _{CC} = 18V	-	1.3	1.8	V
High output voltage	V _{OH}	I _O = -100mA, V _{CC} = 18V	16.0	16.5	18.0	V
Rise time ^(Note1)	T _R	No load	-	50	-	ns
Fall time ^(Note1)	T _F	No load	-	50	-	ns
OVERALL						
Stand-by current	I _{SB}	V _{CC} = 14V	-	90	150	uA
Operating current	I _{CC(OPR)}	V _{PIN2} = 0V	-	9	15	mA
Power supply current off	I _{CC(OFF)}	V _{PIN8} = 0V	-	1.1	1.8	mA
Power supply current shutdown	I _{CC(SD)}	V _{PIN8} = 7.6V	-	1.1	1.8	mA

Note :

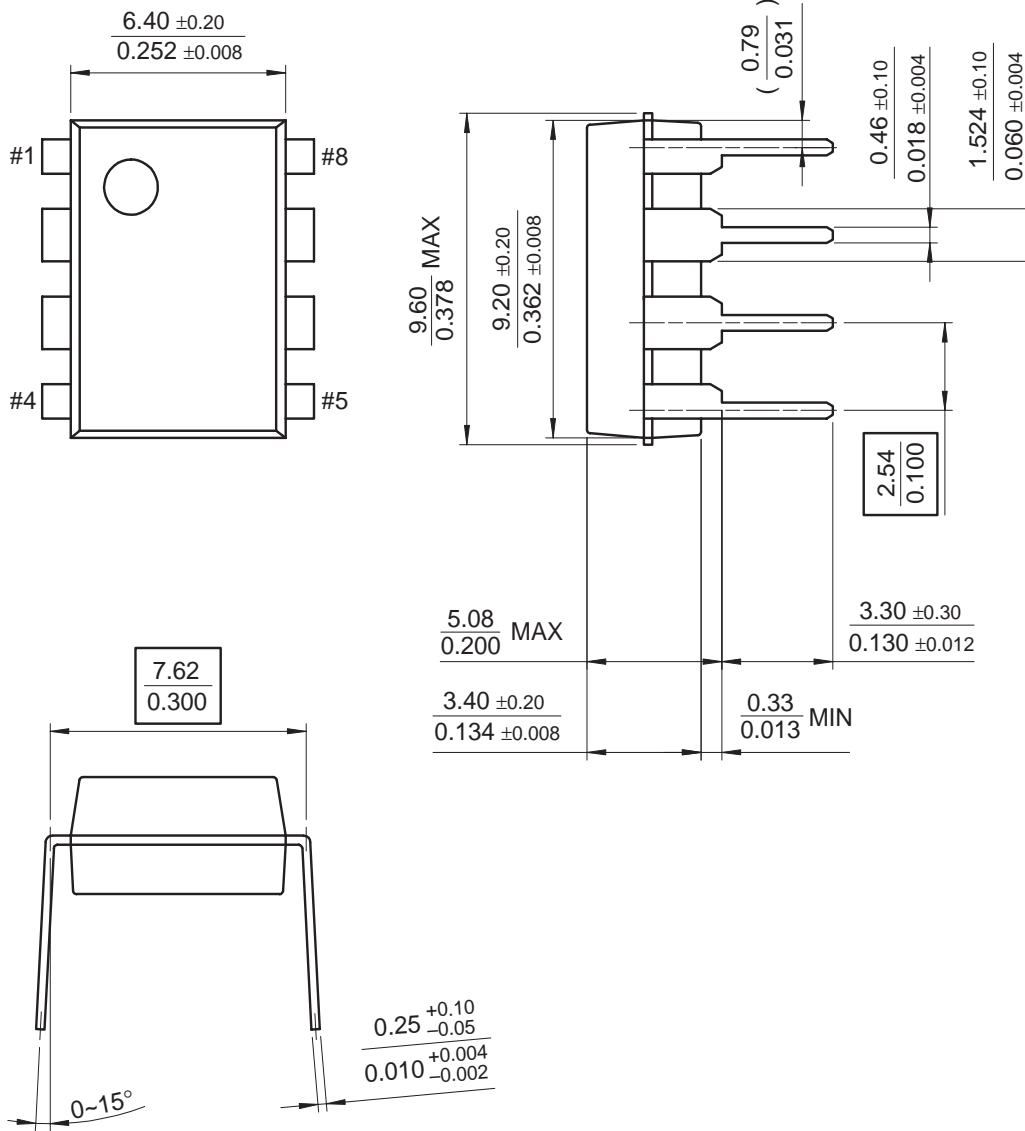
1. These parameters, although guaranteed, are not 100% tested in production.
2. Recommend operating condition :
 - V_{CC(min)} = 12V
 - R_T = 3.3kΩ ~ 10kΩ
 - Oscillation frequency = 5kHz ~ 600kHz
 - Soft start capacitor(C_S) = 0.1uF ~ 1uF

Mechanical Dimensions

Package

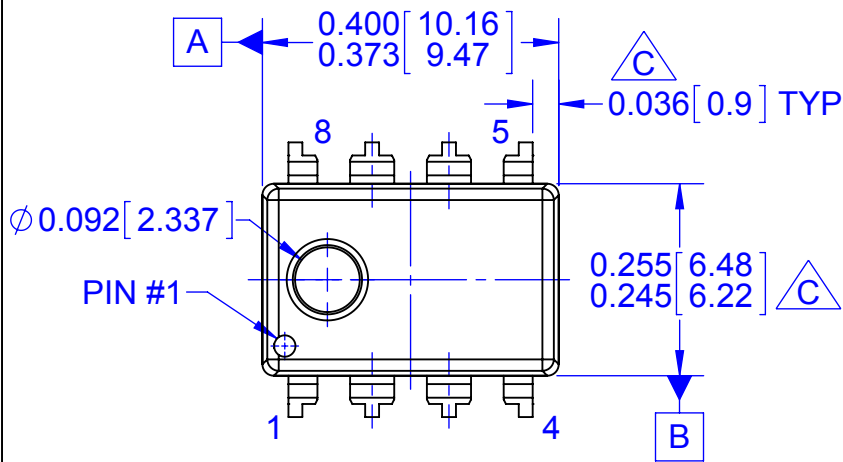
Dimensions in millimeters

8-DIP

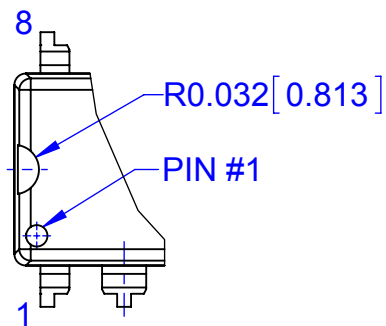


Ordering Information

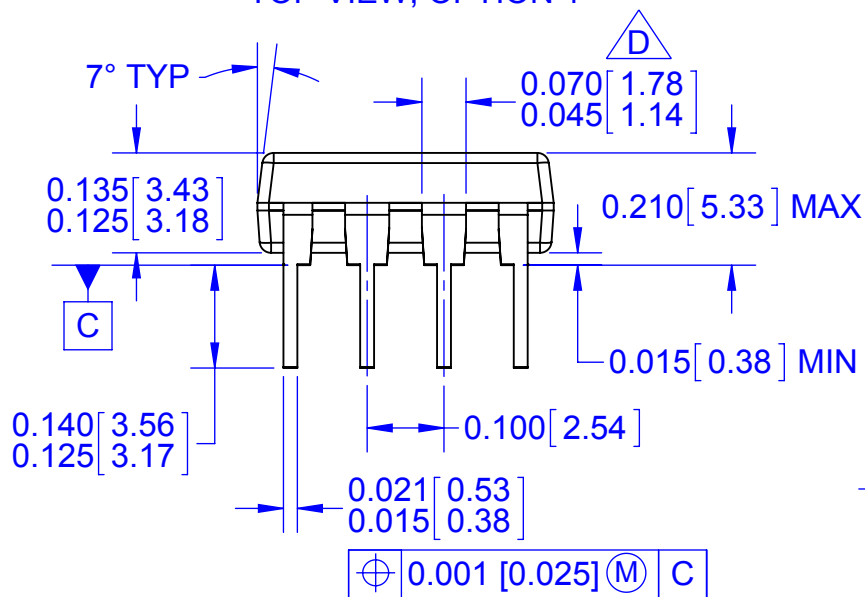
Product Number	Package	Operating Temperature
KA7552A	8-DIP	-25 ~ +85°C
KA7553A		



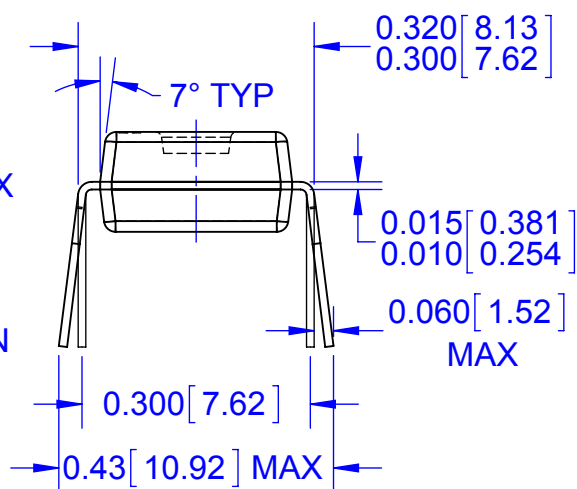
TOP VIEW, OPTION 1



TOP VIEW, OPTION 2



FRONT VIEW



SIDE VIEW

NOTES:

- A. CONFORMS TO JEDEC MS-001, VARIATION BA
- B. CONTROLLING DIMENSIONS ARE IN INCHES.
REFERENCE DIMENSIONS ARE IN MILLIMETERS.

C DOES NOT INCLUDE MOLD FLASH OR PROTRUSIONS.
MOLD FLASH OR PROTRUSIONS SHALL NOT EXCEED
0.010 INCHES OR 0.25MM.

D DOES NOT INCLUDE DAMBAR PROTRUSIONS.
DAMBAR PROTRUSIONS SHALL NOT EXCEED 0.010
INCHES OR 0.25MM.

E. DIMENSIONING AND TOLERANCING PER ASME
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