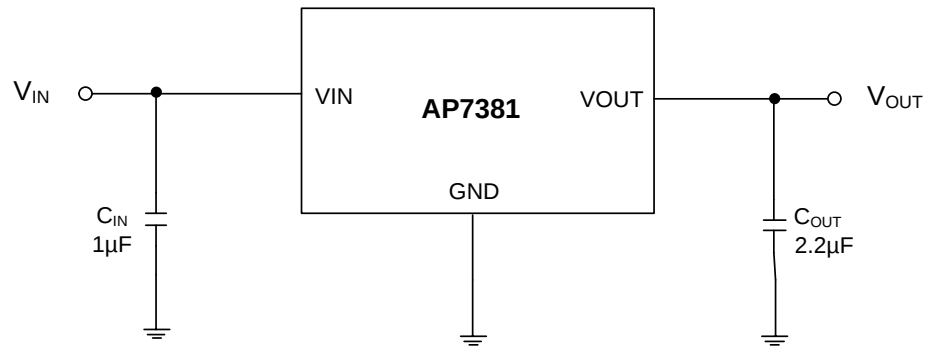


Typical Applications Circuit



Pin Descriptions

Pin Number			Pin Name	Function
TO92 (Ammo Packing)	SOT89	SOT23		
3	3	1	VIN	Input voltage
2	2	3	GND	Ground
1	1	2	VOUT	Regulated output voltage

Absolute Maximum Ratings (Note 4)

Symbol	Parameter	Rating		Unit
VIN	Supply Input Voltage	-0.3 to 45		V
VOUT	Output Voltage	-0.3 to 8		V
IOUT	Output Current	150		mA
TLEAD	Lead Temperature (Soldering, 10s)	+260		°C
TJ	Operating Junction Temperature	+150		°C
θJA	Thermal Resistance	SOT89	125	°C/W
		TO92 (Ammo Packing)	165	
		SOT23	167	
TSTG	Storage Temperature Range	-65 to +150		°C
CDM	ESD (Change Device Model)	2000		V
HBM	ESD (Human Body Model)	4000		V

Note: 4. a). Stresses beyond those listed under *Absolute Maximum Ratings* can cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these conditions is not implied. Exposure to absolute-maximum-rated conditions for extended periods can affect device reliability.
b). Ratings apply to ambient temperature at +25°C. The JEDEC High-K board design used to derive this data is a 2inch × 2inch multi-layer board with 1oz internal power and ground planes and 2oz copper traces on the top and bottom of the board.

Recommended Operating Conditions

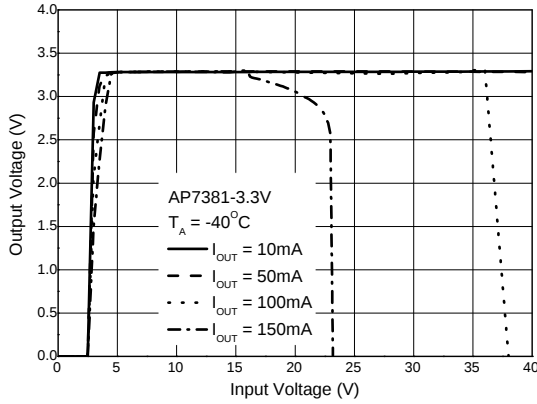
Symbol	Parameter	Min	Max	Unit
VIN	Supply Input Voltage	3.3	40	V
TJ	Operating Junction Temperature	-40	+125	°C

Electrical Characteristics ($T_J = +25^\circ\text{C}$, $I_{OUT} = 1\text{mA}$, $C_{IN} = 1.0\mu\text{F}$, $C_{OUT} = 2.2\mu\text{F}$, $V_{IN} = V_{OUT} + 2\text{V}$, **Bold** typeface applies over $-40^\circ\text{C} \leq T_J \leq +125^\circ\text{C}$, unless otherwise specified.)

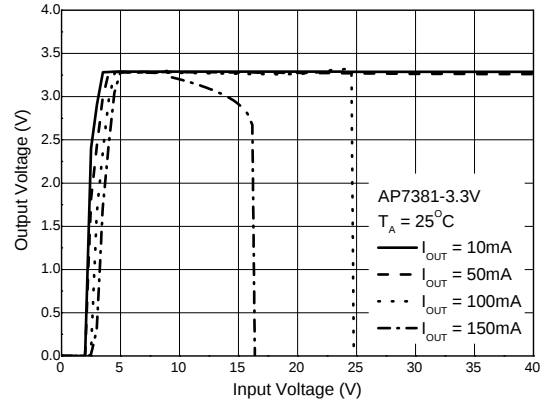
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{OUT}	Output Voltage	Variation from Specified V_{OUT}	$V_{OUT} \times 98\%$	—	$V_{OUT} \times 102\%$	V
V_{IN}	Input Voltage	—	3.3	—	40	V
I_{LIMIT}	Current Limit	$V_{OUT} = 98\% \times V_{OUT}$, $V_{IN} = V_{OUT} + 2\text{V}$	150	—	—	mA
$\Delta V_{OUT}/\Delta V_{IN}$	Line Regulation	$V_{OUT} + 2\text{V} \leq V_{IN} \leq 40\text{V}$, $I_{OUT} = 10\text{mA}$	—	0.05	—	%/V
$\Delta V_{OUT}/I_{OUT}$	Load Regulation	$1\text{mA} \leq I_{OUT} \leq 150\text{mA}$	—	0.5	—	%
V_{DROP}	Dropout Voltage	$I_{OUT} = 100\text{mA}$ @ $V_{OUT} = 3.3\text{V}$	—	1000	—	mV
I_{GND}	Ground Current	$I_{OUT} = 0\text{A}$	—	2.5	—	μA
		$I_{OUT} = 100\text{mA}$	—	25	—	
$\Delta V_{OUT}/(V_{OUT} \Delta T)$	Output Voltage Temperature Coefficient	$I_{OUT} = 100\mu\text{A}$, $-40^\circ\text{C} \leq T_J \leq +125^\circ\text{C}$	—	± 100	—	ppm/ $^\circ\text{C}$
T_{OTSD}	Thermal Shutdown Temperature	—	—	+160	—	$^\circ\text{C}$
T_{HYOTSD}	Thermal Shutdown Hysteresis	—	—	+20	—	$^\circ\text{C}$
PSRR	Power Supply Rejection Ratio	$I_{OUT} = 1\text{mA}$, $V_{OUT} = 3.3\text{V}$	—	60	—	dB

Performance Characteristics

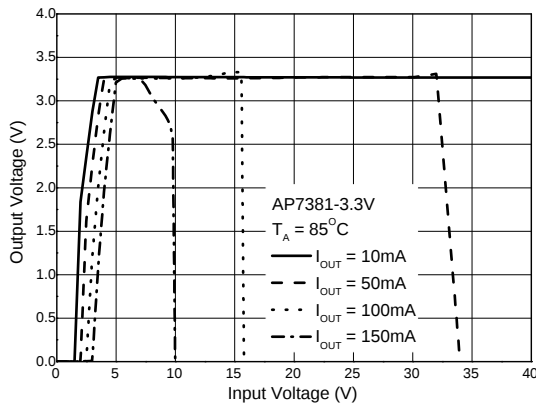
Output Voltage vs. Input Voltage @-40°C



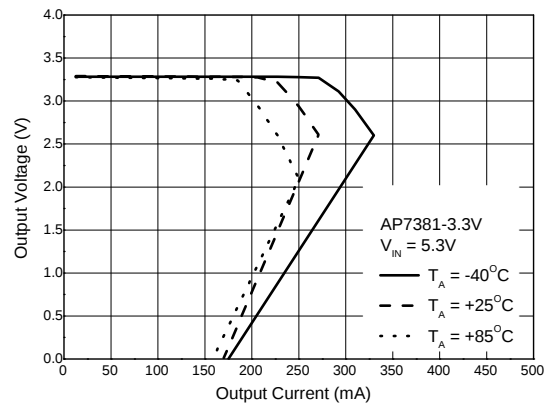
Output Voltage vs. Input Voltage @+25°C



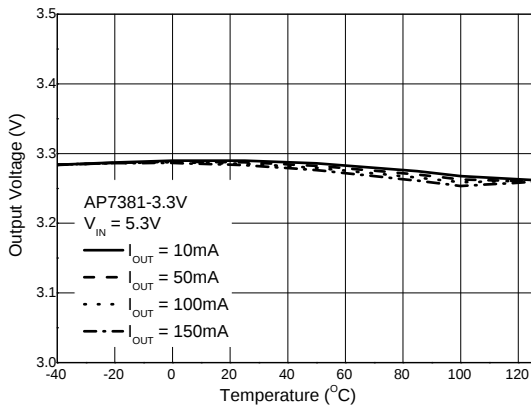
Output Voltage vs. Input Voltage @+85°C



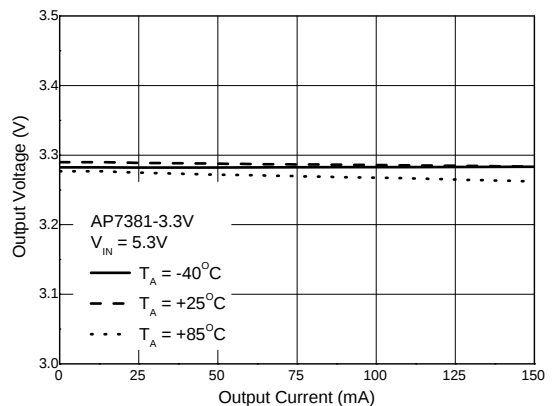
Output Voltage vs. Output Current



Output Voltage vs. Temperature

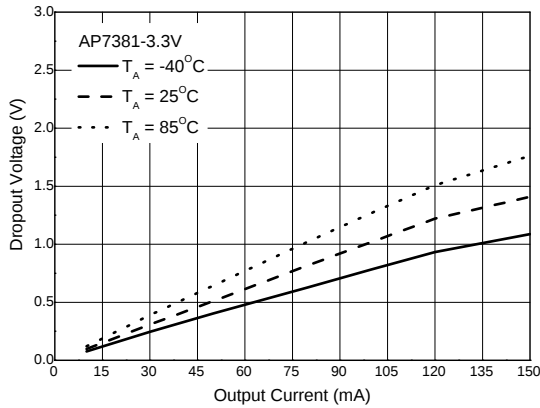


Output Voltage vs. Output Current

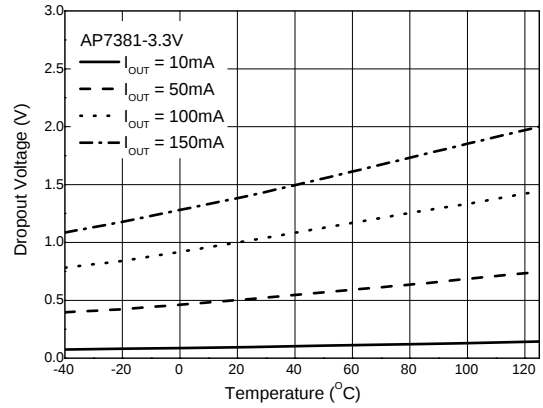


Performance Characteristics (continued)

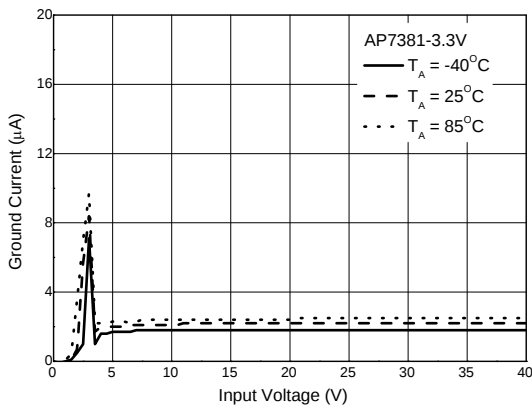
Dropout Voltage vs. Output Current



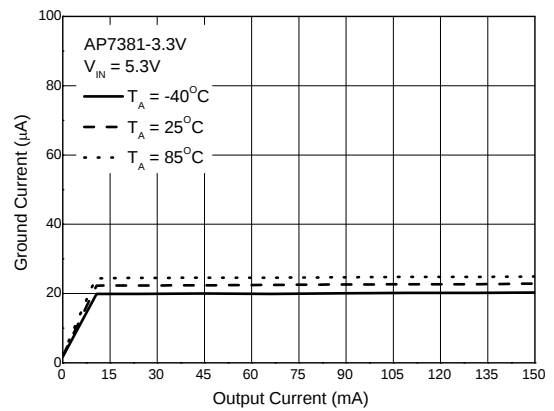
Dropout Voltage vs. Temperature



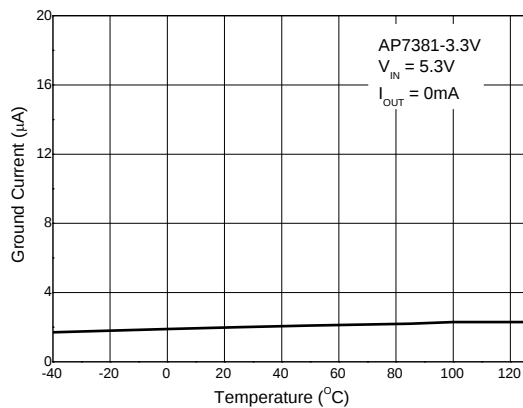
I_{GND} vs. Input Voltage



I_{GND} vs. Output Current

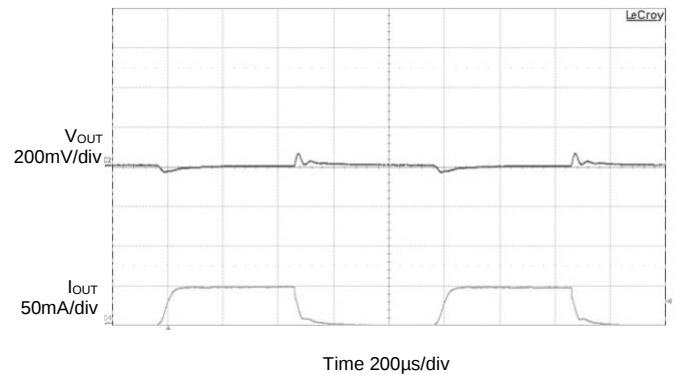


I_{GND} vs Temperature

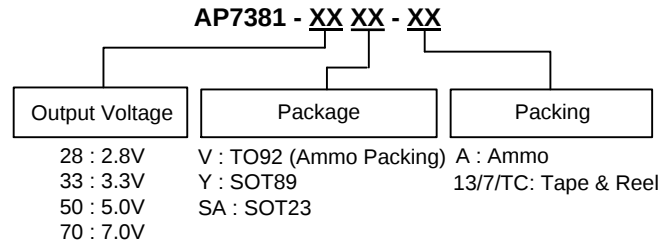


Load Transient

$C_{IN}=1\mu\text{F}$, $C_{OUT}=2.2\mu\text{F}$, $V_{IN}=V_{OUT}+2\text{V}$, $I_{OUT}=0$ to 50mA



Ordering Information (Note 5)



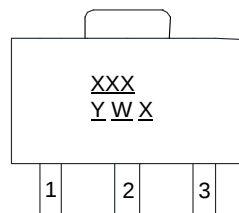
Part Number	Package Code	Packaging	Tape and Reel/Ammo	
			Quantity	Part Number Suffix
AP7381-28V-A	V	TO-92 (Ammo Packing)	2000/Ammo	-A
AP7381-33V-A	V	TO92 (Ammo Packing)	2000/Ammo	-A
AP7381-50V-A	V	TO92 (Ammo Packing)	2000/Ammo	-A
AP7381-70V-A	V	TO92 (Ammo Packing)	2000/Ammo	-A
AP7381-28Y-13	Y	SOT89	2500/Tape & Reel	-13
AP7381-33Y-13	Y	SOT89	2500/Tape & Reel	-13
AP7381-50Y-13	Y	SOT89	2500/Tape & Reel	-13
AP7381-70Y-13	Y	SOT89	2500/Tape & Reel	-13
AP7381-33Y-TC	Y	SOT89	4000/Tape & Reel	-TC
AP7381-28SA-7	SA	SOT23	3000/Tape & Reel	-7
AP7381-33SA-7	SA	SOT23	3000/Tape & Reel	-7
AP7381-50SA-7	SA	SOT23	3000/Tape & Reel	-7
AP7381-70SA-7	SA	SOT23	3000/Tape & Reel	-7

Note: 5. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information

(1) SOT89

(Top View)



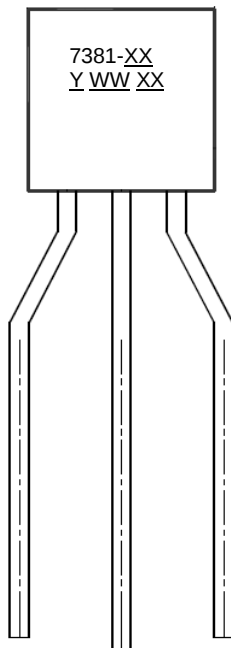
XXX : Identification Code
Y : Year : 0 ~ 9
W : Week : A ~ Z : 1 ~ 26 Week;
a ~ z : 27 ~ 52 Week;
z Represents 52 and 53 Week
X : Internal Code

Part Number	Package	Identification Code
AP7381-28Y-13	SOT89	D9C
AP7381-33Y-13	SOT89	D9A
AP7381-50Y-13	SOT89	D9B
AP7381-70Y-13	SOT89	D9D
AP7381-33Y-TC	SOT89	D9A

Marking Information (continued)

(2) TO92 (Ammo Packing)

(Front View)



7381-XX : Identification Code

Y : Year : 0 ~ 9

WW : Week : 01 ~ 52; 52

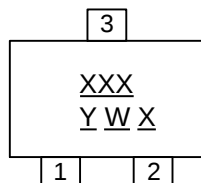
Represents 52 and 53 Week

XX : Internal Code

Part Number	Package	Identification Code
AP7381-28V-A	TO92 (Ammo Packing)	7381-28
AP7381-33V-A	TO92 (Ammo Packing)	7381-33
AP7381-50V-A	TO92 (Ammo Packing)	7381-50
AP7381-70V-A	TO92 (Ammo Packing)	7381-70

(3) SOT23

(Top View)



XXX : Identification Code

Y : Year 0 to 9

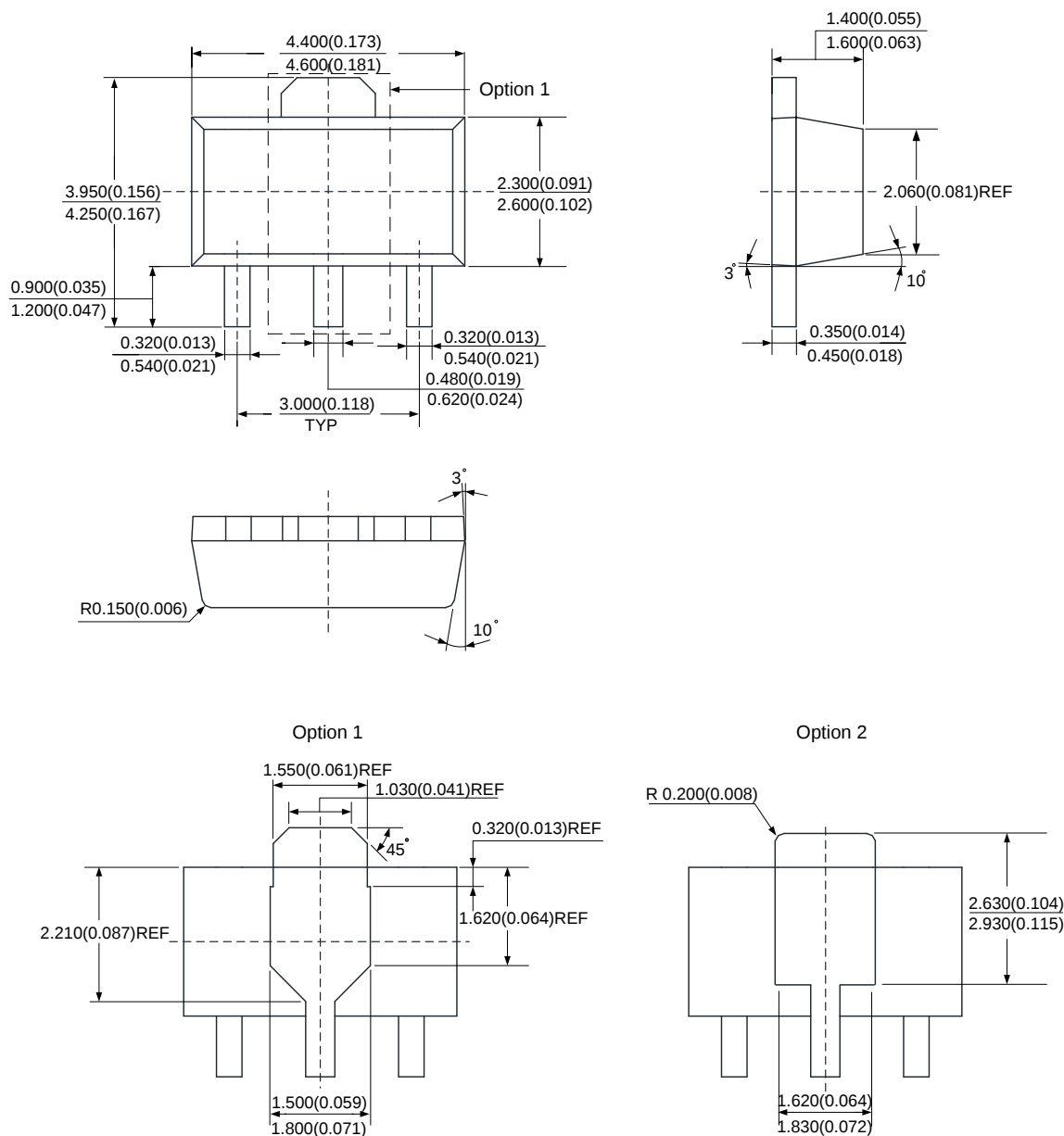
W : Week : A to Z : 1 to 26 week;

a to z : 27 to 52 week; z represents
52 and 53 week

X : Internal Code

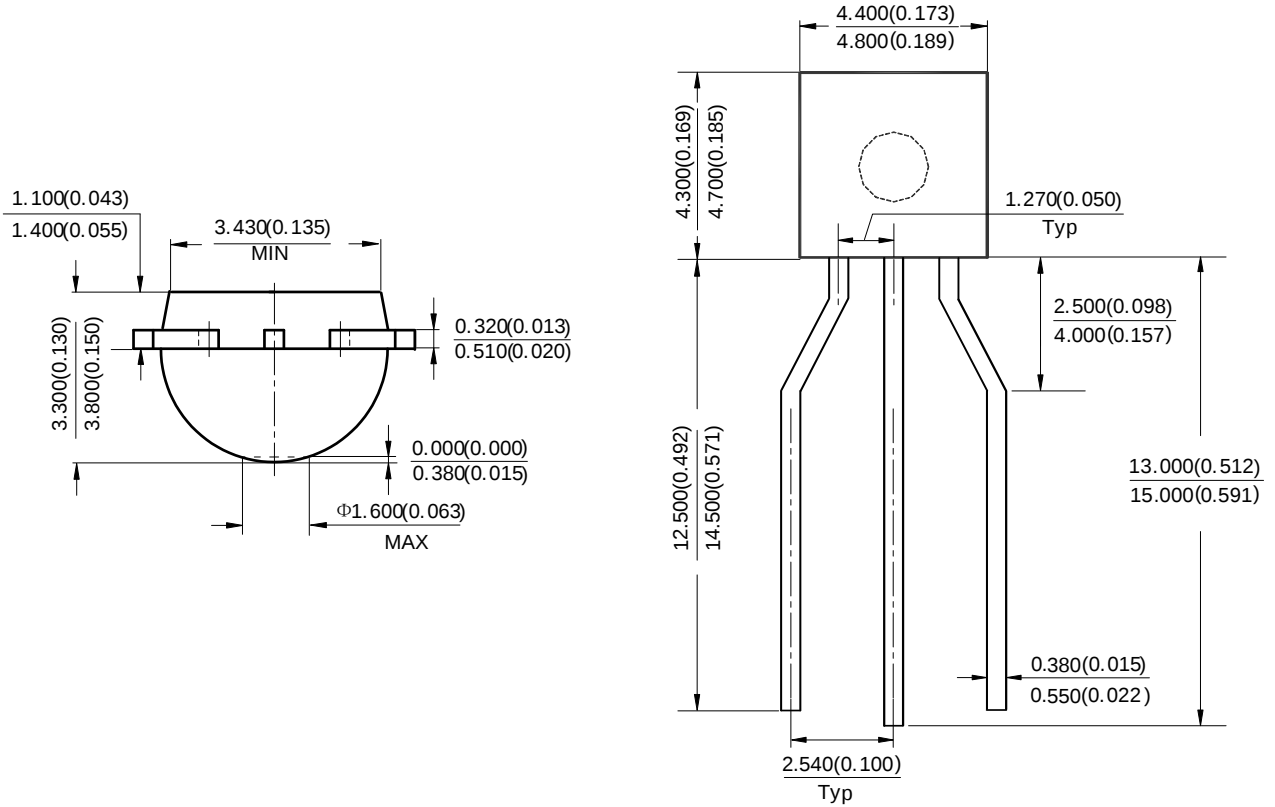
Part Number	Package	Identification Code
AP7381-28SA-7	SOT23	D9C
AP7381-33SA-7	SOT23	D9A
AP7381-50SA-7	SOT23	D9B
AP7381-70SA-7	SOT23	D9D

(1) Package Type: SOT89



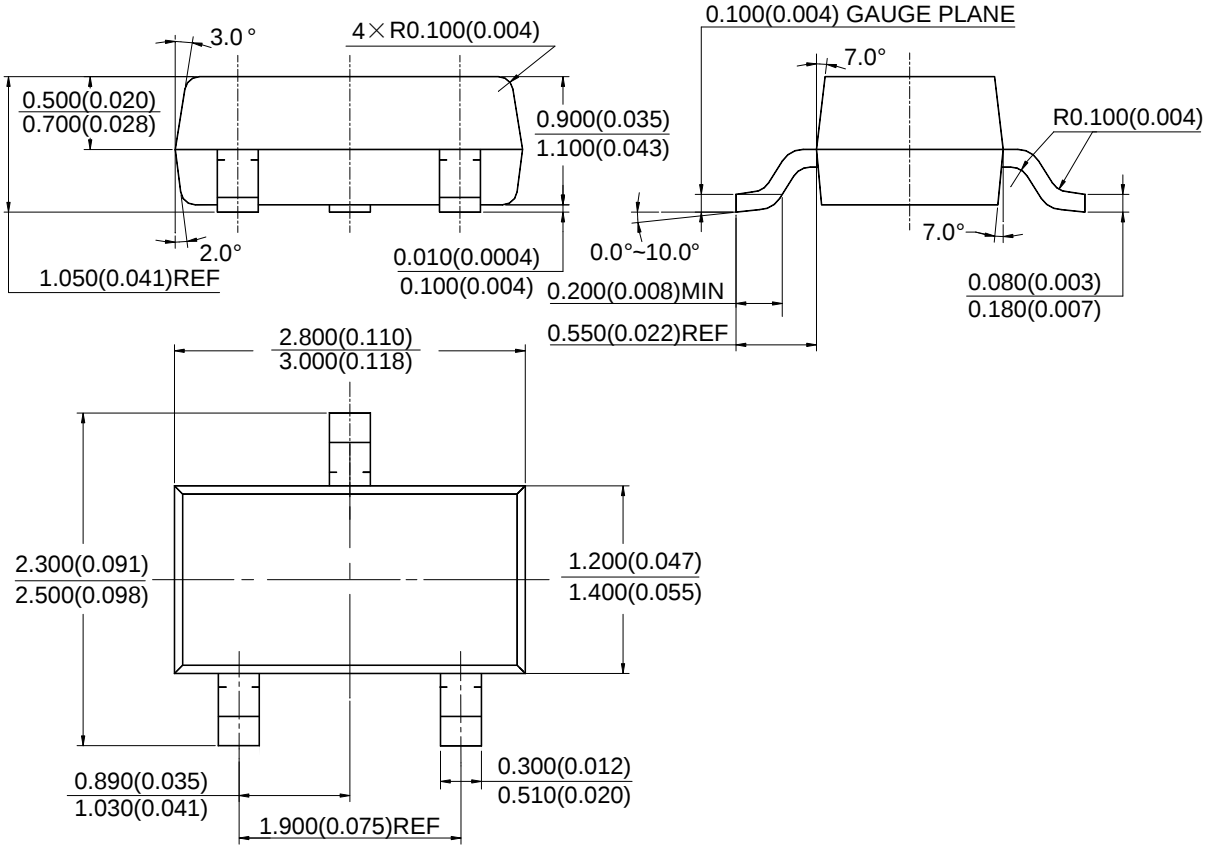
Package Outline Dimensions (All dimensions in mm.) (continued)

(2) Package Type: TO92 (Ammo Packing)



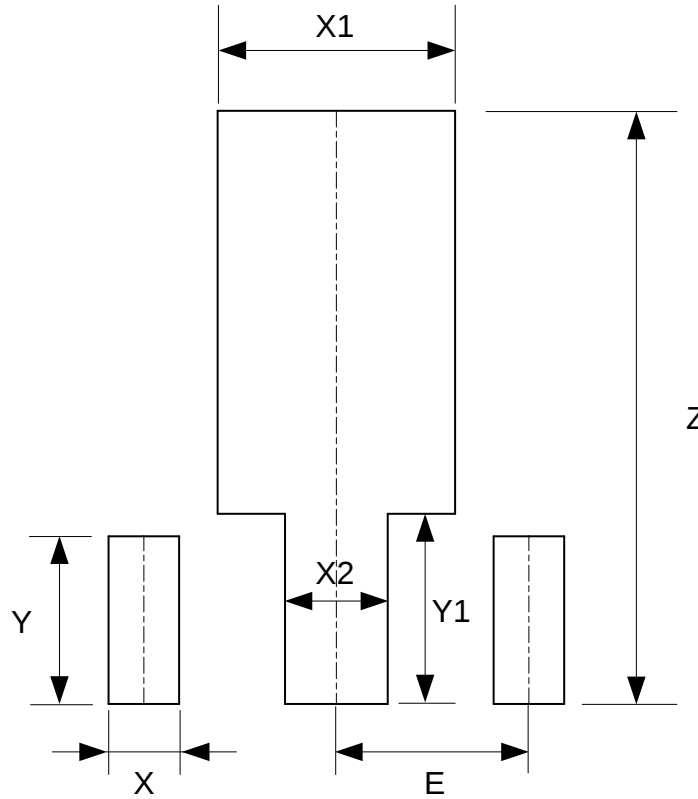
Package Outline Dimensions (All dimensions in mm.) (continued)

(3) Package Type: SOT23



Suggested Pad Layout

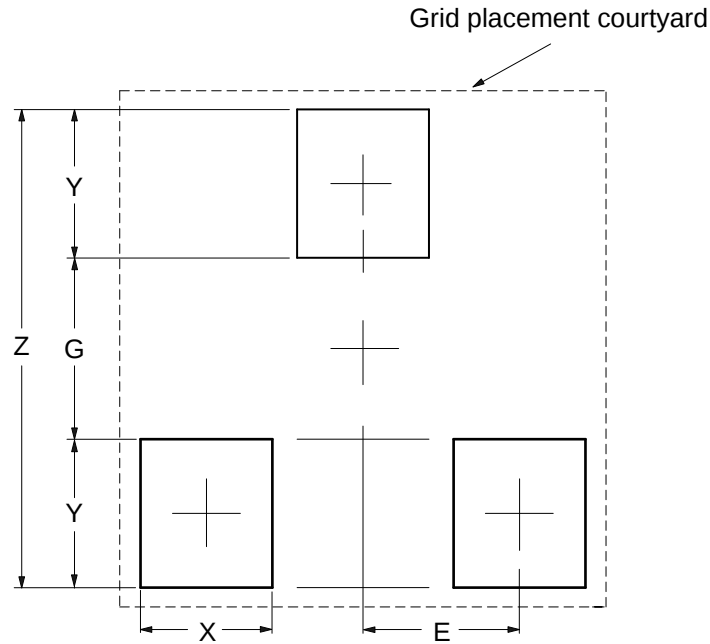
(1) Package Type: SOT89



Dimensions	Z (mm)/(inch)	X (mm)/(inch)	X1 (mm)/(inch)	X2 (mm)/(inch)	Y (mm)/(inch)	Y1 (mm)/(inch)	E (mm)/(inch)
Value	4.600/0.181	0.550/0.022	1.850/0.073	0.800/0.031	1.300/0.051	1.475/0.058	1.500/0.059

Suggested Pad Layout (continued)

(2) Package Type: SOT23



Dimensions	Z (mm)/(inch)	G (mm)/(inch)	X (mm)/(inch)	Y (mm)/(inch)	E (mm)/(inch)
Value	2.900/0.114	1.100/0.043	0.800/0.031	0.900/0.035	0.950/0.037

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