IXD1201

Positive Voltage Regulator

FEATURES

- Output Current up to 250mA
- Output Voltage Range from 1.3 V to 6.0 V with 0.1 V increments
- Output Voltage Accuracy ±1% (at V_{OUT} > 2.0 V), ±2%
- Dropout Voltage 0.16 V @ 100 mA , 0.40 V @ 200 mA
- Maximum Operating Voltage 10 V
- Low Power Consumption at 2.0 µA typical
- Operating Ambient Temperature - 40/+ 85^{0}C
- Packages : SOT-25, SOT-89 ,TO-92, and USP-6B
- EU RoHS Compliant, Pb Free
- Tantalum or Ceramic Capacitor compatible

APPLICATIONS

- Mobile phones
- Cameras, VCRs
- Various portable equipment
- Reference voltage source

DESCRIPTION

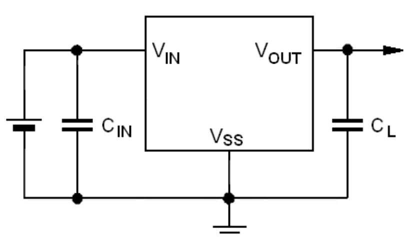
The IXD1201 is a precise positive voltage regulator with low power consumption, manufactured using CMOS technology. Laser trimming guarantees ±1% precision of the output voltage above 2 V.

The IXD1201regulator is able to provide large currents at a small dropout voltage.

The IXD1201 consists of a current limiter circuit, a driver transistor, a precision reference voltage, and an error amplifier. Output voltage is selectable in 0.1V steps between 1.3 V ~ 6.0 V.

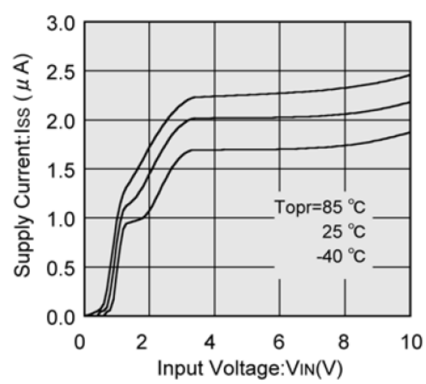
Regulator is available in SOT-25, SOT-89, USP-6B, and TO-92 packages.

TYPICAL APPLICATION CIRCUIT



TYPICAL PERFORMANCE CHARACTERISTIC

Supply Current vs. Input Voltage (IXD1201P332)



ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNITS
Input Voltage		V_{IN}	– 0.3 ~ 12.0	V
Output Current		I_{OUT}	500	mA
Output Voltage		V_{OUT}	– 0.3 ~ V_{IN} + 0.3	V
EXT Pin Voltage		V_{EXT}	V_{SS} – 0.3 ~ V_{OUT} + 0.3	V
EXT Pin Current		I_{EXT}	100	mA
CE Input Voltage		V_{CE}	– 0.3 ~ 12.0	V
VDD Input Voltage		V_{DD}	– 0.3 ~ 12.0	V
Power Dissipation	SOT-25	P_D	250	mW
	SOT-89		500	
	TO-92		300	
	USP-6C		120	
Operating Temperature Range		T_{OPR}	– 40 ~ + 85	^{0}C
Storage Temperature Range		T_{STG}	– 55 ~ +125	^{0}C

ELECTRICAL OPERATING CHARACTERISTICS

IXD1201P132 $V_{OUT(T)}$ = 1.3 V*1

Ta = 25 ^{0}C

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	CIRCUIT
Output Voltage	$V_{OUT(E)}$*2	V_{IN} = 2.3 V, I_{OUT} = 10 mA	1.274	1.300	1.326	V	②
Maximum Output Current	I_{OUT_MAX}	V_{IN} = 2.3 V, V_{OUT} ≥ 1.17 V	60			mA	②
Load Regulation	ΔV_{OUT}	V_{IN} = 2.3 V, 1 mA ≤ I_{OUT} ≤ 30 mA		10	30	mV	②
Dropout Voltage*3	V_{DIF1}	I_{OUT} = 30 mA		200	600	mV	②
	V_{DF2}	I_{OUT} = 60 mA		500	810		
Supply Current	I_{SS}	V_{IN} = 2.3 V		2.0	5.0	µA	①
Line Regulation	$\frac{100 * \Delta}{* \Delta}$	I_{OUT} = 10 mA, 2.3 V ≤ V_{IN} ≤ 10 V		0.2	0.3	%/V	②
Output Voltage Temperature Characteristics	$\frac{\Delta}{* \Delta}$	I_{OUT} = 40 mA - 40 ^{0}C ≤ T_{OPR} ≤ 85 ^{0}C		± 100		ppm/^{0}C	①

IXD1201P182 $V_{OUT(T)}$ = 1.8 V*1

Ta = 25 ^{0}C

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	CIRCUIT
Output Voltage	$V_{OUT(E)}$*2	V_{IN} = 2.8 V, I_{OUT} = 40 mA	1.764	1.800	1.836	V	②
Maximum Output Current	I_{OUT_MAX}	V_{IN} = 2.8 V, V_{OUT} ≥ 1.62 V	80			mA	②
Load Regulation	ΔV_{OUT}	V_{IN} = 2.8 V, 1 mA ≤ I_{OUT} ≤ 40 mA		10	30	mV	②
Dropout Voltage*3	V_{DIF1}	I_{OUT} = 40 mA		200	370	mV	②
	V_{DF2}	I_{OUT} = 80 mA		450	710		
Supply Current	I_{SS}	V_{IN} = 2.8 V		2.0	5.0	µA	①
Input Voltage	V_{IN}				10	V	
Line Regulation	$\frac{100 * \Delta}{* \Delta}$	I_{OUT} = 40 mA, 2.8 V ≤ V_{IN} ≤ 10 V		0.2	0.3	%/V	②
Output Voltage Temperature Characteristics	$\frac{\Delta}{* \Delta}$	I_{OUT} = 40 mA - 40 ^{0}C ≤ T_{OPR} ≤ 85 ^{0}C		± 100		ppm/^{0}C	①

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ELECTRICAL OPERATING CHARACTERISTICS (Continued)

IXD1201P272 $V_{OUT(T)}$ = 2.7 V*1 — Ta = 25 °C

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	CIRCUIT
Output Voltage	$V_{OUT(E)}$*2	V_{IN} = 3.7 V, I_{OUT} = 40 mA	2.646	2.700	2.754	V	②
Maximum Output Current	I_{OUT_MAX}	V_{IN} = 3.7 V, $V_{OUT} \geq$ 2.43 V	100			mA	②
Load Regulation	ΔV_{OUT}	V_{IN} = 3.7 V, 1 mA ≤ I_{OUT} ≤ 60 mA		15	40	mV	②
Dropout Voltage*3	V_{DIF1}	I_{OUT} = 60 mA		200	370	mV	②
	V_{DF2}	I_{OUT} = 120 mA		450	710		
Supply Current	I_{SS}	V_{IN} = 3.7 V		2.0	5.0	µA	①
Input Voltage	V_{IN}				10	V	
Line Regulation	$\frac{100 * \Delta}{* \Delta}$	I_{OUT} = 40 mA, 3.7 V ≤ V_{IN} ≤ 10 V		0.2	0.3	%/V	②
Output Voltage Temperature Characteristics	$\frac{\Delta}{* \Delta}$	I_{OUT} = 40 mA - 40 °C ≤ T_{OPR} ≤ 85 °C		±100		ppm/°C	①

IXD1201P332 $V_{OUT(T)}$ = 3.3 V*1 — Ta = 25 °C

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	CIRCUIT
Output Voltage	$V_{OUT(E)}$*2	V_{IN} = 4.3 V, I_{OUT} = 40 mA	3.234	3.300	3.366	V	②
Maximum Output Current	I_{OUT_MAX}	V_{IN} = 4.3 V, $V_{OUT} \geq$ 2.97 V	150			mA	②
Load Regulation	ΔV_{OUT}	V_{IN} = 4.37 V, 1 mA ≤ I_{OUT} ≤ 80 mA		20	50	mV	②
Dropout Voltage*3	V_{DIF1}	I_{OUT} = 80 mA		200	360	mV	②
	V_{DF2}	I_{OUT} = 160 mA		450	700		
Supply Current	I_{SS}	V_{IN} = 4.3 V		2.0	5.0	µA	①
Input Voltage	V_{IN}				10	V	
Line Regulation	$\frac{100 * \Delta}{* \Delta}$	I_{OUT} = 40 mA, 4.3 V ≤ V_{IN} ≤ 10 V		0.2	0.3	%/V	②
Output Voltage Temperature Characteristics	$\frac{\Delta}{* \Delta}$	I_{OUT} = 40 mA - 40 °C ≤ T_{OPR} ≤ 85 °C		±100		ppm/°C	①

IXD1201P502 $V_{OUT(T)}$ = 5.0 V*1 — Ta = 25 °C

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	CIRCUIT
Output Voltage	$V_{OUT(E)}$*2	V_{IN} = 6.0 V, I_{OUT} = 40 mA	4.900	5.000	5.100	V	②
Maximum Output Current	I_{OUT_MAX}	V_{IN} = 6.9 V, $V_{OUT} \geq$ 4.57 V	200			mA	②
Load Regulation	ΔV_{OUT}	V_{IN} = 6.0 V, 1 mA ≤ I_{OUT} ≤ 100 mA		30	70	mV	②
Dropout Voltage*3	V_{DIF1}	I_{OUT} = 100 mA		160	340	mV	②
	V_{DF2}	I_{OUT} = 200 mA		400	600		
Supply Current	I_{SS}	V_{IN} = 6.0 V		2.0	6.0	µA	①
Input Voltage	V_{IN}				10	V	
Line Regulation	$\frac{100 * \Delta}{* \Delta}$	I_{OUT} = 40 mA, 6.0 V ≤ V_{IN} ≤ 10 V		0.2	0.3	%/V	②
Output Voltage Temperature Characteristics	$\frac{\Delta}{* \Delta}$	I_{OUT} = 40 mA - 40 °C ≤ T_{OPR} ≤ 85 °C		±100		ppm/°C	①

NOTE:

*1) $V_{OUT(T)}$ = Nominal output voltage.
*2) $V_{OUT(E)}$ = Effective output voltage (i.e. the output voltage when "$V_{OUT(T)}$ + 1.0 V" is provided while maintaining a certain I_{OUT} value).
3) V_{DIF} = (V_{IN1} - V_{OUT1}), is a voltage drop across regulator, where V_{IN1} is a minimum Input Voltage at which V_{OUT1} = 0.98 $V_{OUT(E)}$ appears as the output, while output current is equal shown at CONDITION requirements.

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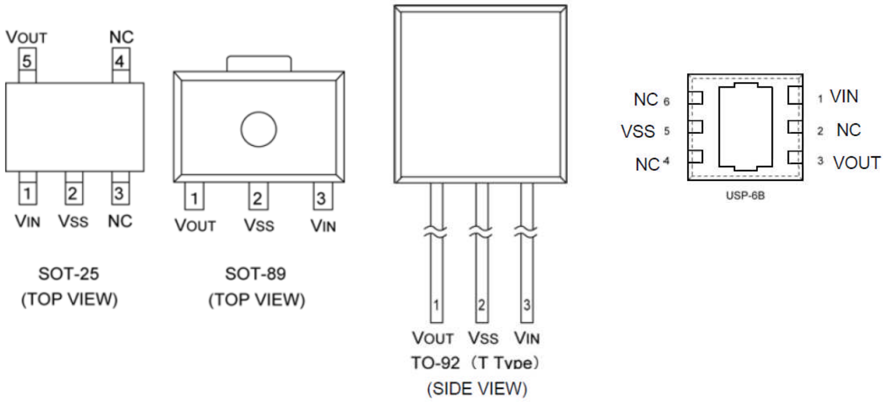
PIN CONFIGURATION

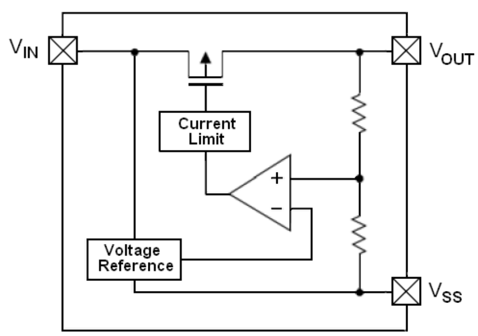


*The dissipation pad for the USP-6B package should be solder-plated in recommended mounting pattern and metal masking to enhance mounting strength and heat release.
If the pad needs to be connected to other pins, it should be connected to the V_{SS} (No.5) pin.

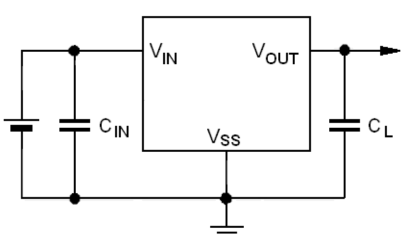
PIN ASSIGNMENT

PIN NUMBER			PIN NAME	FUNCTIONS
SOT-25	SOT-89 (TO-92)	USP-6B		
5	1	3	V_{OUT}	Output Voltage
2	2	5	V_{SS}	Ground
1	3	1	V_{IN}	Power Input
3, 4	-	2, 4, 6	NC	No Connect

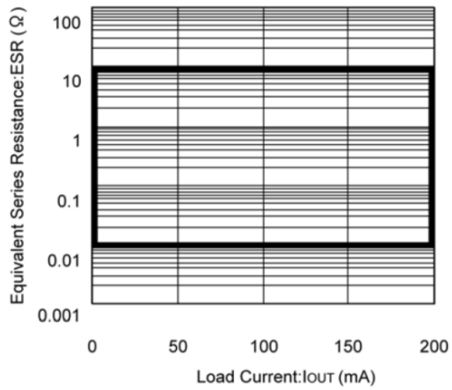
BLOCK DIAGRAM



TYPICAL APPLICATION CIRCUIT



The output capacitor $C_L \geq 1$ µF should be connected between the output pin (V_{OUT}) and the V_{SS} pin for stable regulator's operation.
Ceramic capacitors with low ESR are recommended for output voltages above 1.7 V. For output voltages in the range from 1.3 V to 1.6 V, we recommend tantalum capacitors $C_L \geq$ 2.2 µF. In addition, the input capacitor $C_{IN} \geq 1$ µF should be connected between the V_{IN} and the V_{SS}.
Area of stable regulator's operation vs. load current and C_L ESR is shown at the graph below.



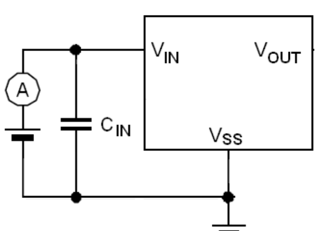
V_{IN} = 1.8 V -10V, V_{OUT} = 1.7 - 6.0 V, C_{IN} = C_L = 1.0 μF (ceramic)

LAYOUT AND USE CONSIDERATIONS

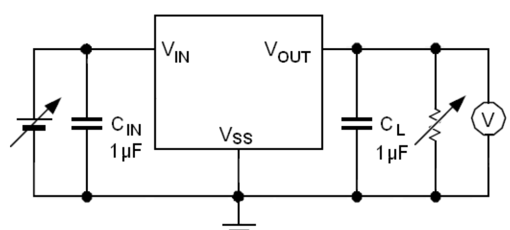
1. Mount external component as close to the IC as possible and use thick, short connecting traces to reduce the circuit impedance.
2. The IC may malfunction if absolute maximum ratings are exceeded.
3. If this voltage regulator is used in schematic, where output voltage may exceed input voltage, a Schottky barrier diode between V_{OUT} and V_{IN} pins should be installed in parallel to the regulator with anode connected to V_{OUT}, to prevent V_{OUT} from exceeding the V_{IN}.
4. If power source of this regulator is a high impedance device with impedance of 10 Ω or more, an input capacitor $C_{IN} \geq 1$μF should be used to prevent oscillations.
5. In case of high output current, increasing the input capacitor value can stabilize operations.
6. Oscillations may occur also, if the input capacitor value is not enough to reduce the input impedance and the output capacitor C_L is large. In such case, operations can be stabilized by either increasing the input capacitor or reducing the output capacitor.
7. Please ensure that output current I_{OUT} is less than $P_D / (V_{IN} - V_{OUT})$, where P_D is a rated power dissipation value of the package shown at ABSOLUTE MAXIMUM RATING table to not exceed it.

TEST CIRCUITS

Circuit ① - Supply Current



Circuit ② - Output Voltage, Oscillation, Line Regulation, Dropout Voltage, Load Regulation



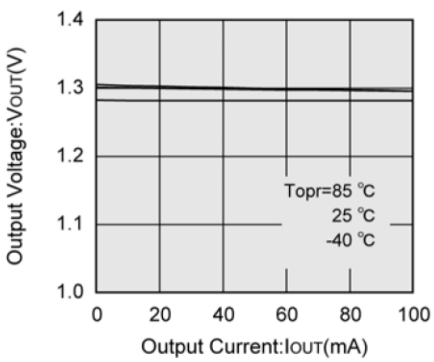
TYPICAL PERFORMANCE CHARACTERISTICS

(1) Output Voltage vs. Output Current

Topr = 25 ^{0}C

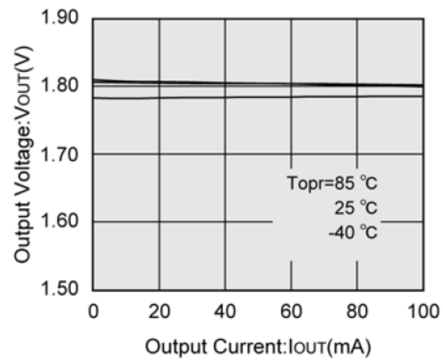
IXD1201P132

V_{IN} = 2.3 V, C_{IN} = 1µF, C_L = 2.2 µF (tantalum)



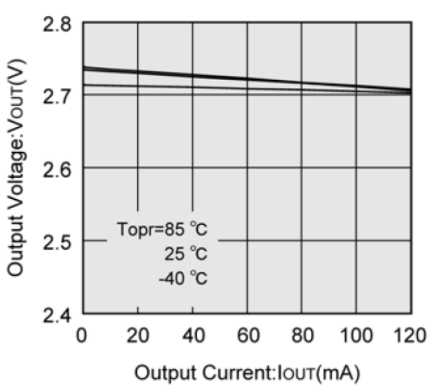
IXD1201P182

V_{IN} = 2.8 V, C_{IN} = C_L = 1µF, (tantalum)



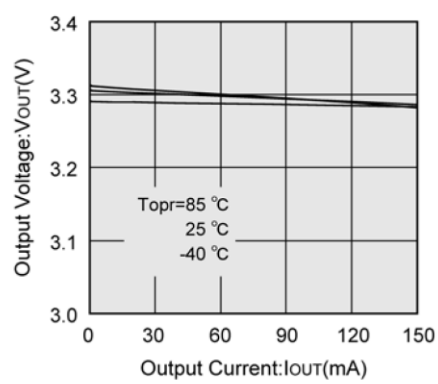
IXD1201P272

V_{IN} = 3.7 V, C_{IN} = C_L = 1µF, (tantalum)



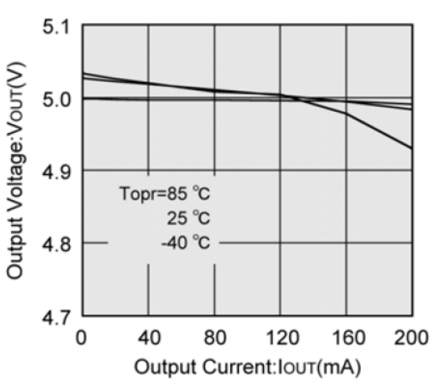
IXD1201P332

V_{IN} = 4.3 V, C_{IN} = C_L = 1µF, (tantalum)



IXD1201P502

V_{IN} = 6.0 V, C_{IN} = C_L = 1µF, (tantalum)



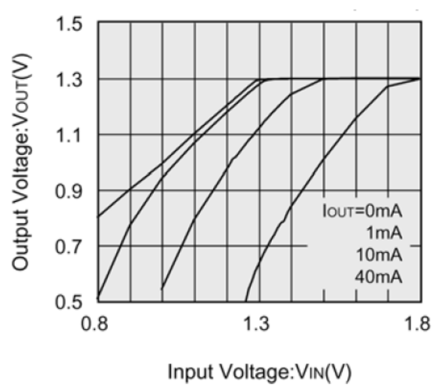
TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

(2) Output Voltage vs. Input Voltage

Topr = 25 ^{0}C

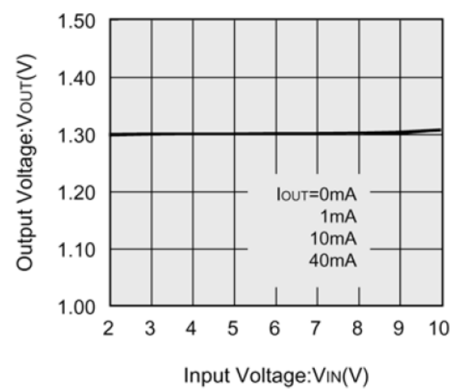
IXD1201P132

C_{IN} = 1µF, C_L = 2.2 µF (tantalum)



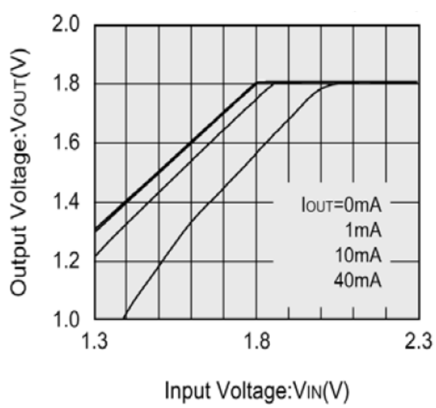
IXD1201P132

C_{IN} = 1µF, C_L = 2.2 µF (tantalum)



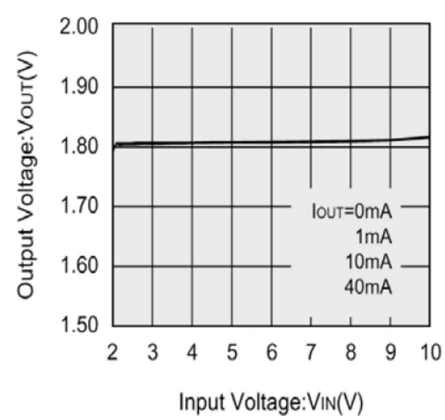
IXD1201P182

C_{IN} = C_L = 1µF, (tantalum)



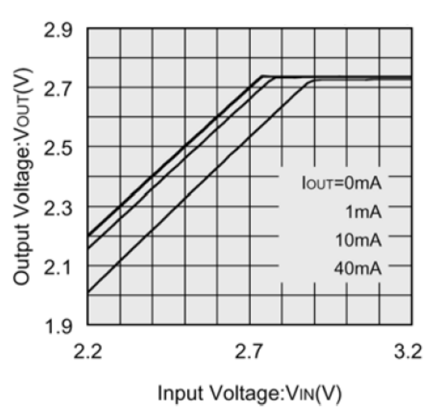
IXD1201P182

C_{IN} = C_L = 1µF, (tantalum)



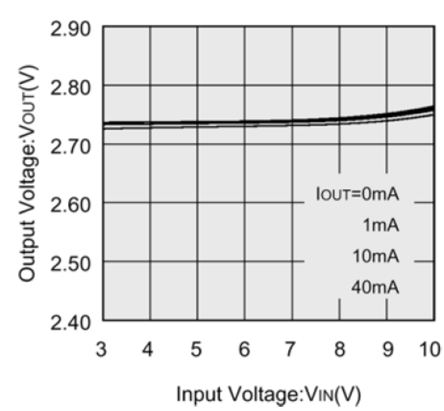
IXD1201P272

C_{IN} = C_L = 1µF, (tantalum)



IXD1201P272

C_{IN} = C_L = 1µF, (tantalum)



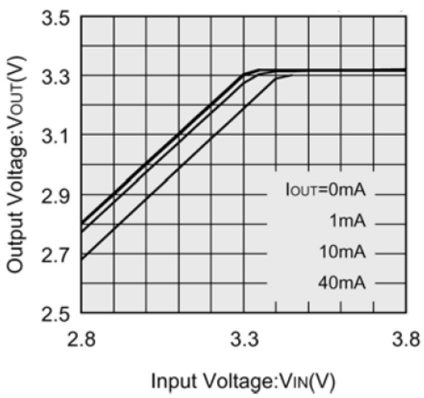
TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

(2) Output Voltage vs. Input Voltage

Topr = 25 ^{0}C

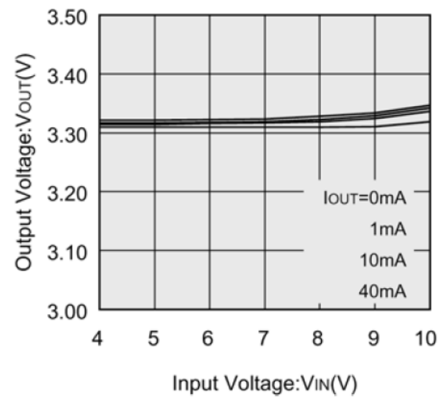
IXD1201P332

C_{IN} = C_L = 1µF, (tantalum)



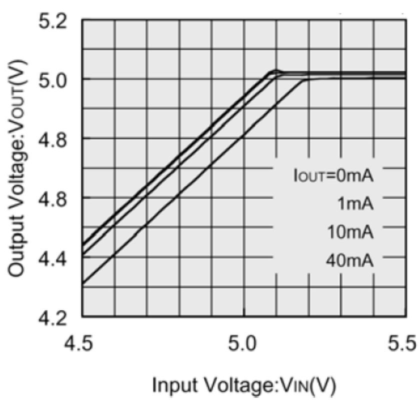
IXD1201P332

C_{IN} = C_L = 1µF, (tantalum)



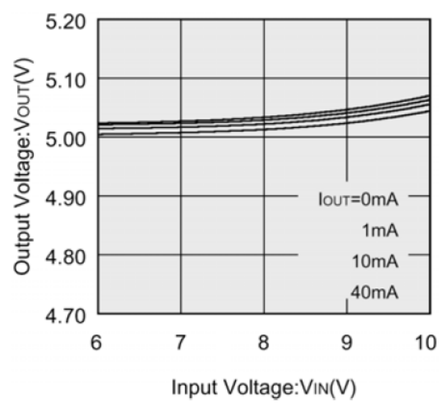
IXD1201P502

C_{IN} = C_L = 1µF, (tantalum)



IXD1201P502

C_{IN} = C_L = 1µF, (tantalum)



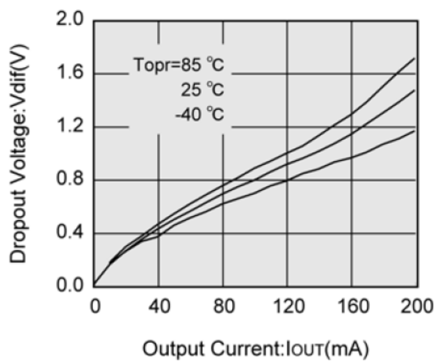
TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

(3) Dropout Voltage vs. Output Current

Topr = 25 ^{0}C

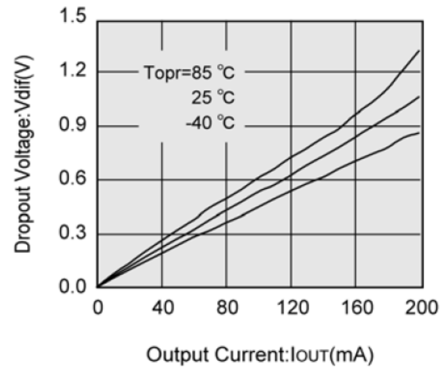
IXD1201P132

C_{IN} = 1µF, C_L = 2.2 µF (tantalum)



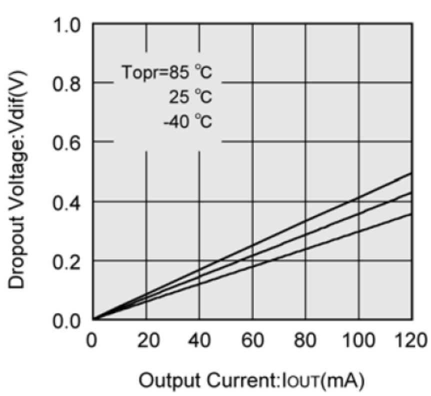
IXD1201P182

C_{IN} = C_L = 1µF, (tantalum)



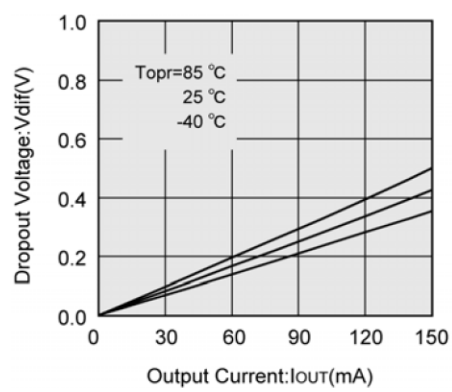
IXD1201P272

C_{IN} = C_L = 1µF, (tantalum)



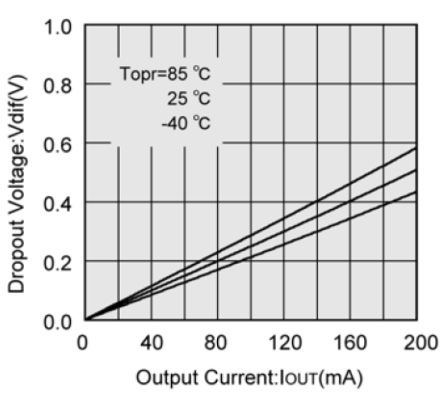
IXD1201P332

C_{IN} = C_L = 1µF, (tantalum)



IXD1201P502

C_{IN} = C_L = 1µF, (tantalum)

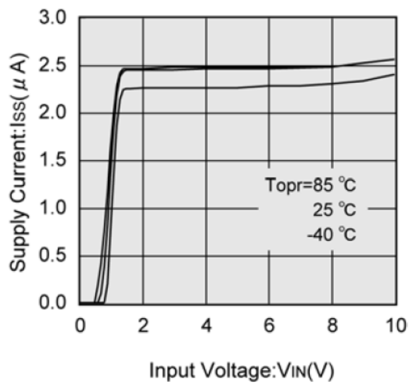


TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

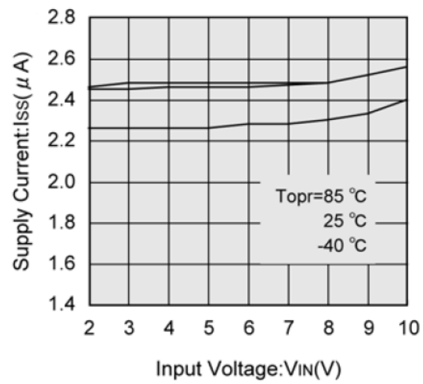
(4) Supply Current vs. Input Voltage

Topr = 25 ^{0}C

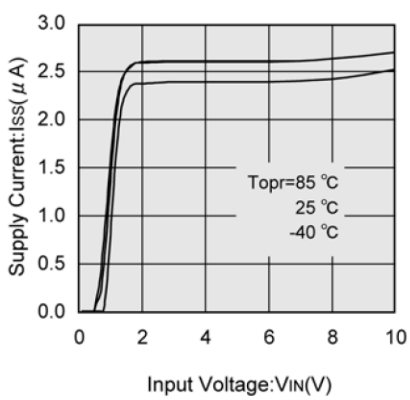
IXD1201P132



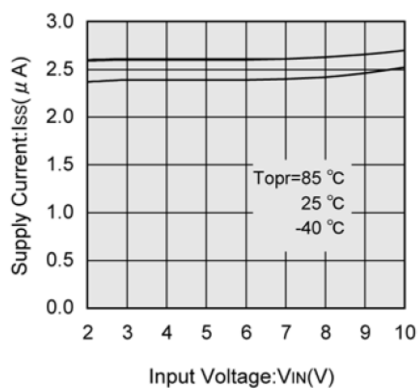
IXD1201P132



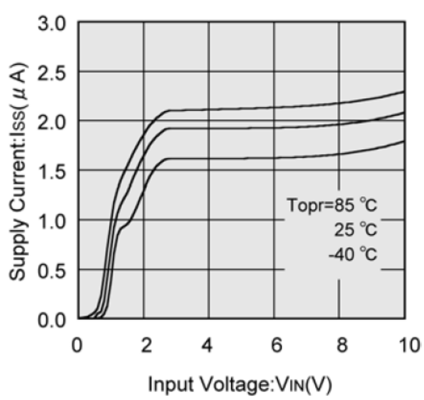
IXD1201P182



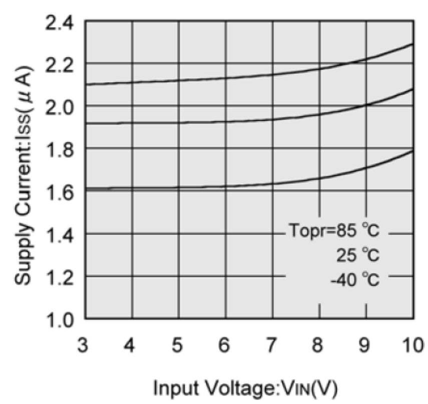
IXD1201P182



IXD1201P272



IXD1201P272

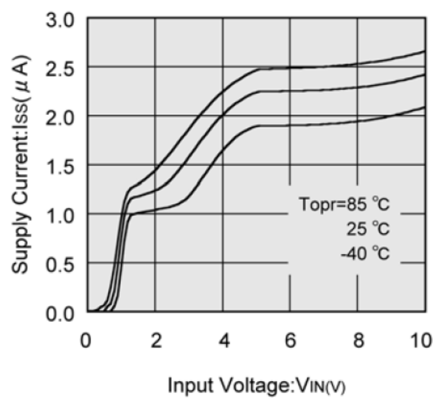


TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

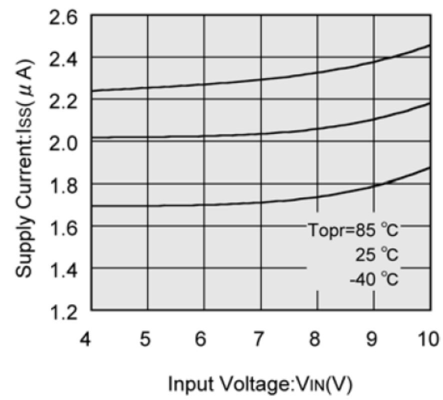
(4) Supply Current vs. Input Voltage

Topr = 25 ^{0}C

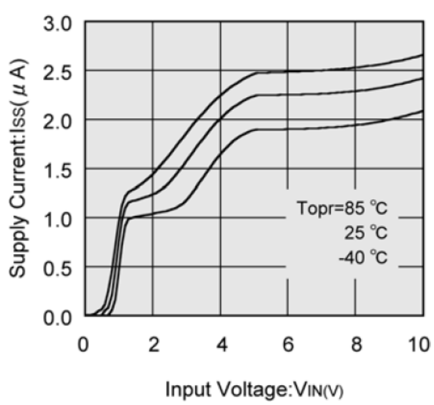
IXD1201P332



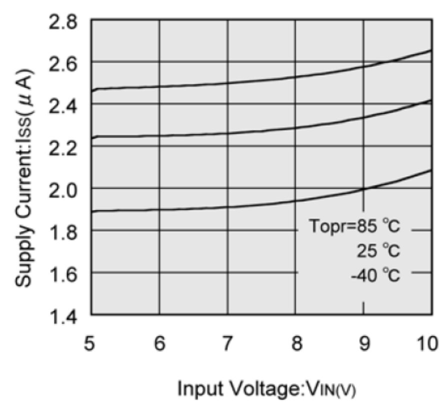
IXD1201P332



IXD1201P502



IXD1201P502



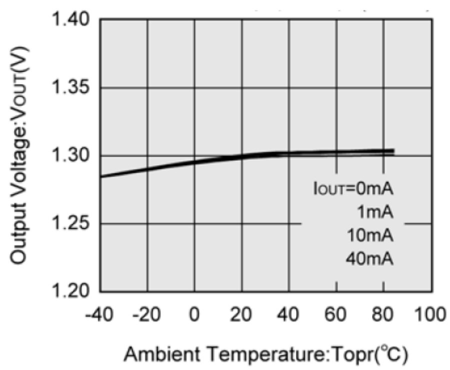
TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

(5) Output Voltage vs. Ambient Temperature

Topr = 25 ^{0}C

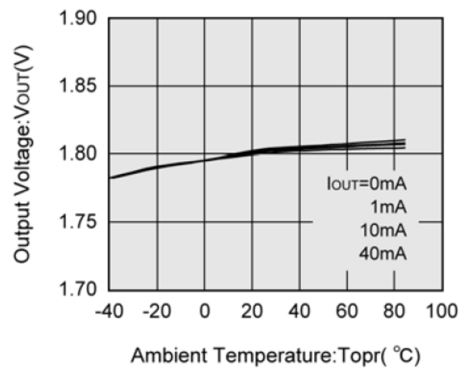
IXD1201P132

C_{IN} = 1µF, C_L = 2.2 µF (tantalum)



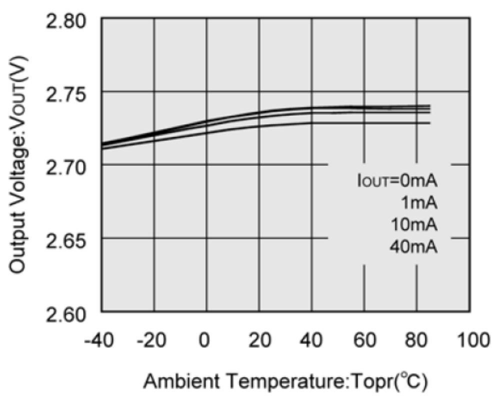
IXD1201P182

C_{IN} = C_L = 1µF, (tantalum)



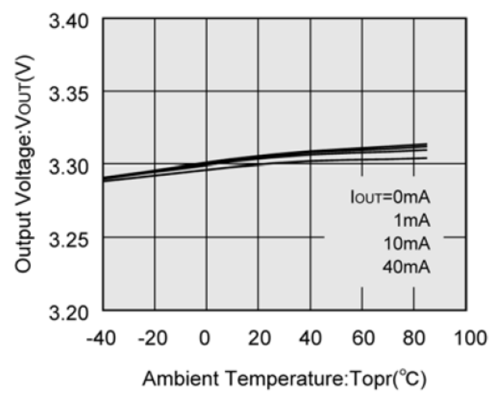
IXD1201P272

C_{IN} = C_L = 1µF, (tantalum)



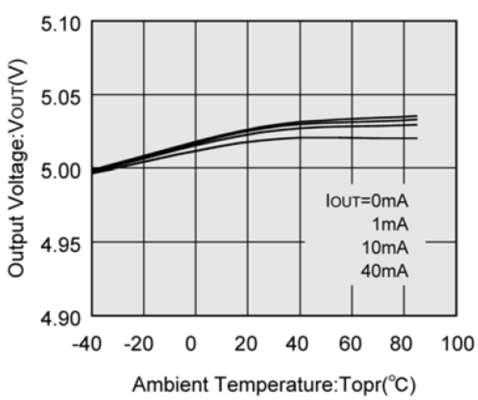
IXD1201P332

C_{IN} = C_L = 1µF, (tantalum)



IXD1201P502

C_{IN} = C_L = 1µF, (tantalum)



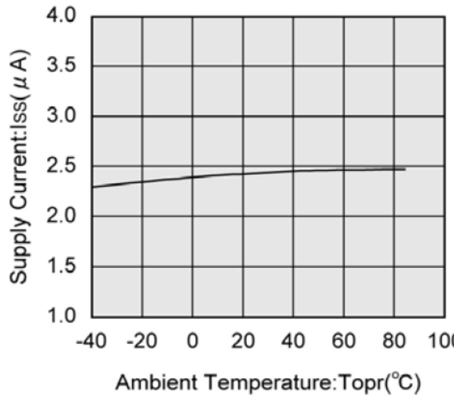
TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

(6) Supply Current vs. Ambient Temperature

Topr = 25 ^{0}C

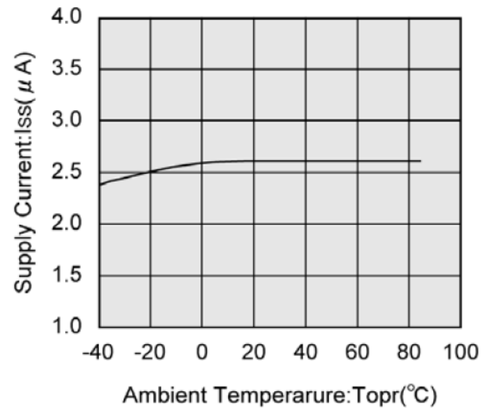
IXD1201P132

V_{IN} = 2.3 V



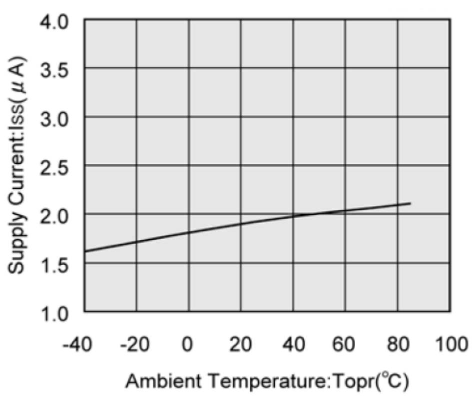
IXD1201P182

V_{IN} = 2.8 V



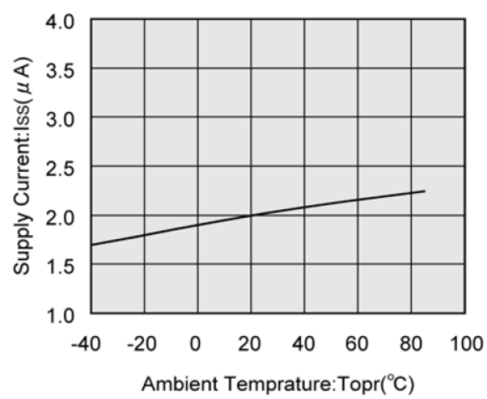
IXD1201P272

V_{IN} = 3.7 V



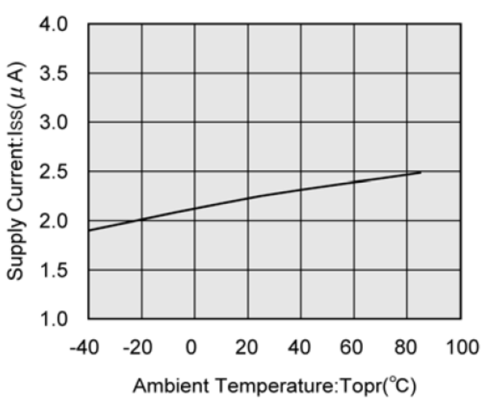
IXD1201P332

V_{IN} = 4.3 V



IXD1201P502

V_{IN} = 6.0 V



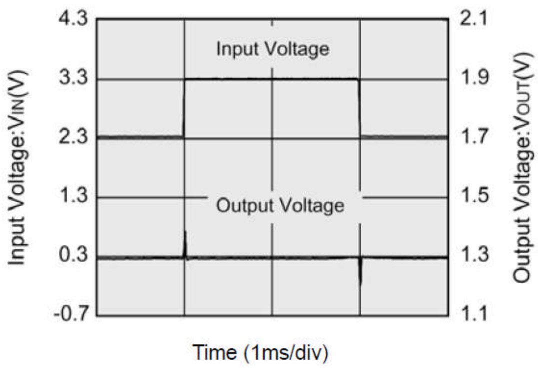
TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

(7) Input Transient Response

Topr = 25 ^{0}C

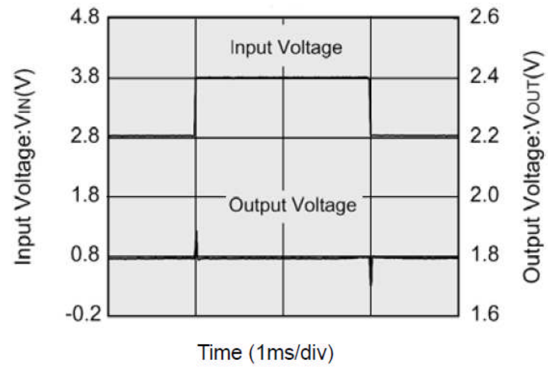
IXD1201P132

V_{IN} = 2.3 V, I_{OUT} = 40 mA, C_{IN} = 1μF, C_L = 2.2 μF (tantalum)



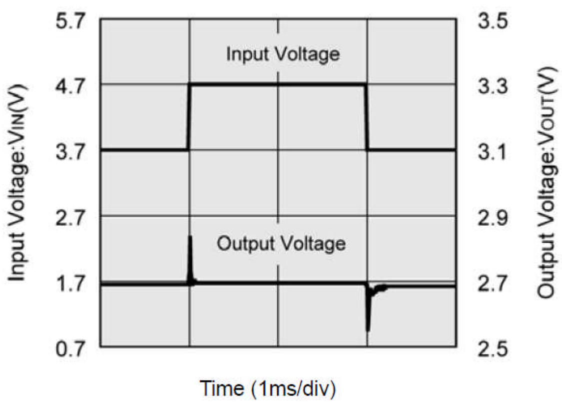
IXD1201P182

V_{IN} = 2.8 V, I_{OUT} = 40 mA, C_{IN} = C_L = 1μF, (tantalum)



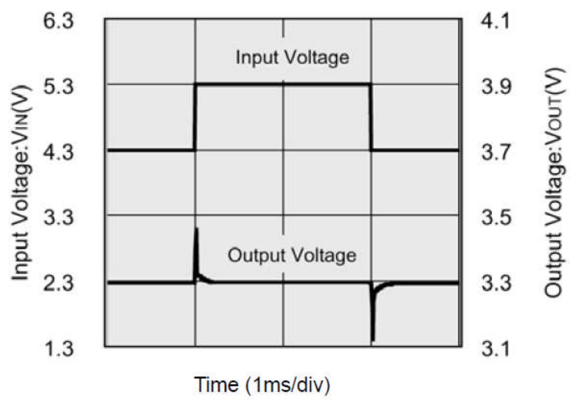
IXD1201P272

V_{IN} = 3.7 V, I_{OUT} = 40 mA, C_{IN} = C_L = 1μF, (tantalum)



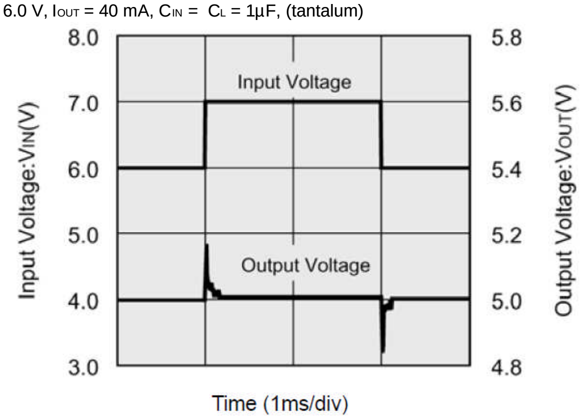
IXD1201P332

V_{IN} = 4.3 V, I_{OUT} = 40 mA, C_{IN} = C_L = 1μF, (tantalum)



IXD1201P502

V_{IN} = 6.0 V, I_{OUT} = 40 mA, C_{IN} = C_L = 1μF, (tantalum)



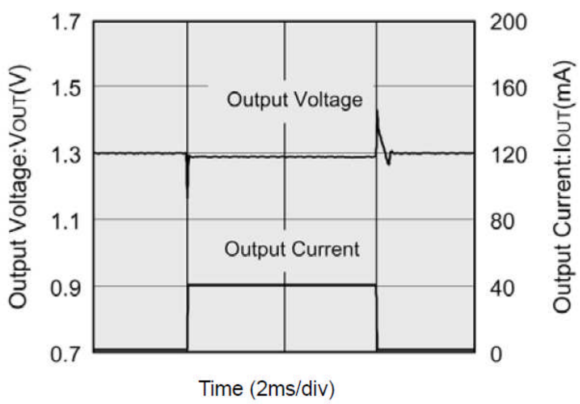
TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

(8) Load Transient Response

Topr = 25 ^{0}C

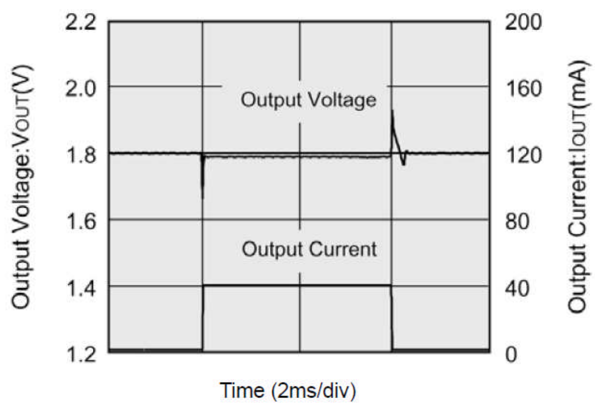
IXD1201P132

V_{IN} = 2.3 V, C_{IN} = 1µF, C_L = 2.2 µF (tantalum)



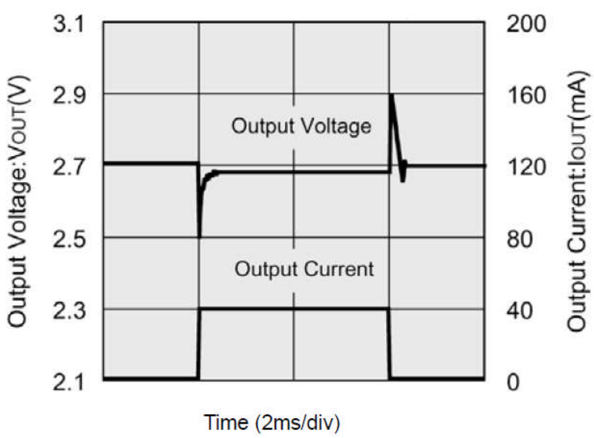
IXD1201P182

V_{IN} = 2.8 V, C_{IN} = C_L = 1µF, (tantalum)



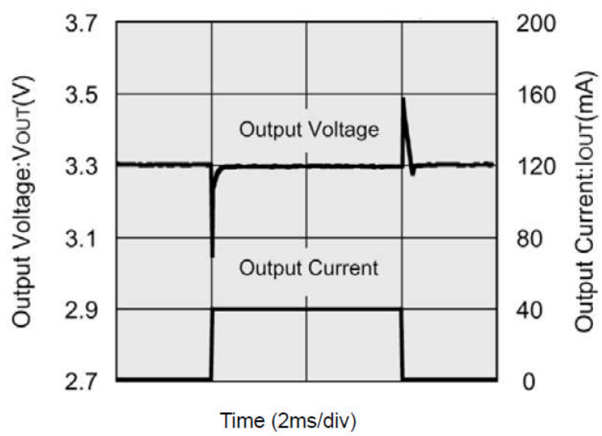
IXD1201P272

V_{IN} = 3.7 V, C_{IN} = C_L = 1µF, (tantalum)



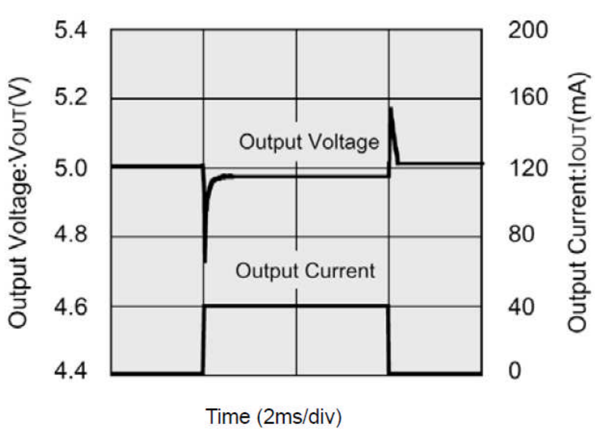
IXD1201P332

V_{IN} = 4.3 V, C_{IN} = C_L = 1µF, (tantalum)



IXD1201P502

V_{IN} = 6.0 V, C_{IN} = C_L = 1µF, (tantalum)



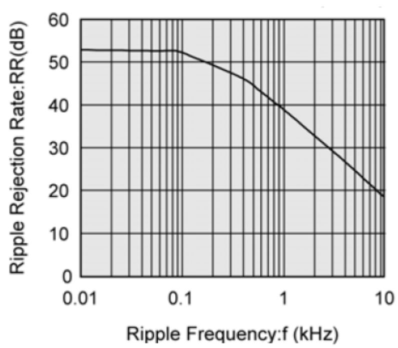
TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

(9) Ripple Rejection Ratio

Topr = 25 ^{0}C

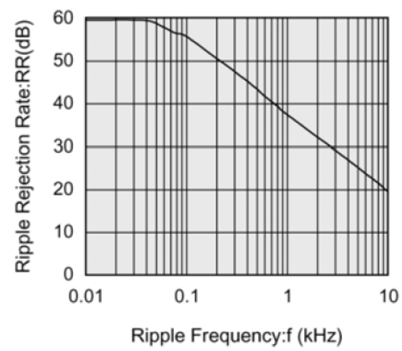
IXD1201P132

V_{IN} = 2.3 V+1.0 Vp-p AC, I_{OUT} = 40 mA, C_{IN} = 1µF, C_L = 2.2 µF (tantalum)



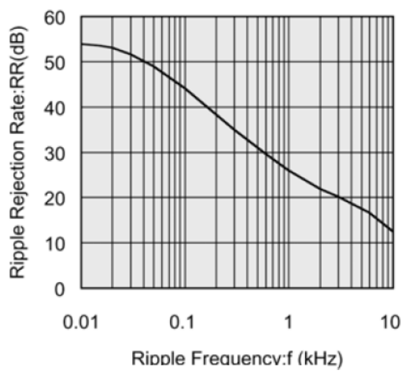
IXD1201P132

V_{IN} = 2.3 V+1.0 Vp-p AC, I_{OUT} = 40 mA, C_{IN} = 1µF, C_L = 2.2 µF (tantalum)



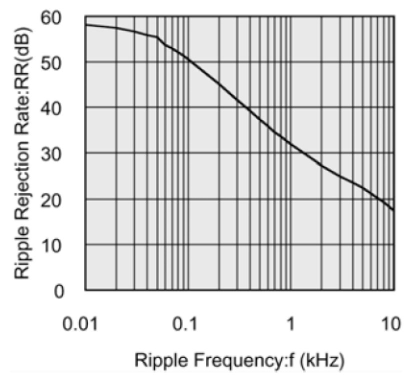
IXD1201P272

V_{IN} = 3.7 V+1.0 Vp-p AC, I_{OUT} = 40 mA, C_{IN} = C_L = 1µF, (tantalum)



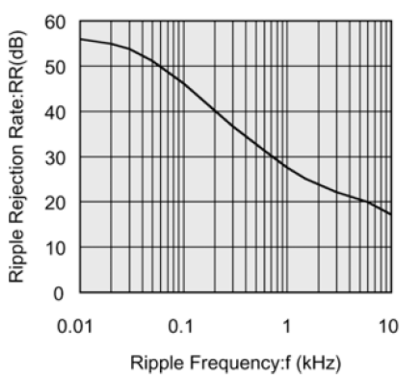
IXD1201P332

V_{IN} = 4.3 V+1.0 Vp-p AC, I_{OUT} = 40 mA, C_{IN} = C_L = 1µF, (tantalum)



IXD1201P502

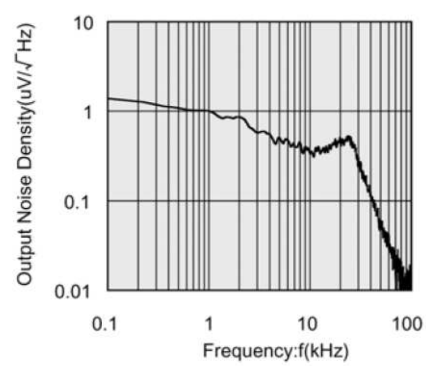
V_{IN} = 6.0 V+1.0 Vp-p AC, I_{OUT} = 40 mA, C_{IN} = C_L = 1µF, (tantalum)



(10) Output Noise Density

IXD1201P302

V_{IN} = 4.0 V, I_{OUT} = 40 mA, C_{IN} = C_L = 1µF, (tantalum)



ORDERING INFORMATION

IXD21①②③④⑤⑥⑦-⑧[*1]-

DESIGNATOR	DESCRIPTION	SYMBOL	DESCRIPTION
①	Product Number	01	
②	Type of Regulator	P	3-pin Regulator
		T	3-pin Regulator rated up V_{IN} = 7 V
③④	Output Voltage	13 - 60	Code Example: 3.3 V is 33, 5.0 V is 50
⑤	Output Voltage Accuracy	1	± 1%[*2]
		2	± 2%
⑥⑦-⑧[*]	Packages (Order Limit)	MR	SOT-25 (3000/Reel)
		MR-G	SOT-25 (3000/Reel)
		PR	SOT-89 (3000/Reel)
		PR-G	SOT-89 (3000/Reel)
		TH	TO-92 Taping Type: Paper tape (2000/Tape)
		TH-G	TO-92 Taping Type: Paper tape (2000/Tape)
		TB	TO-92 Taping Type: Bag (500/Bag)
		TB-G	TO-92 Taping Type: Bag (500/Bag)
		DR	USP-6B (3000/Reel)
		DR-G	USP-6B (3000/Reel)

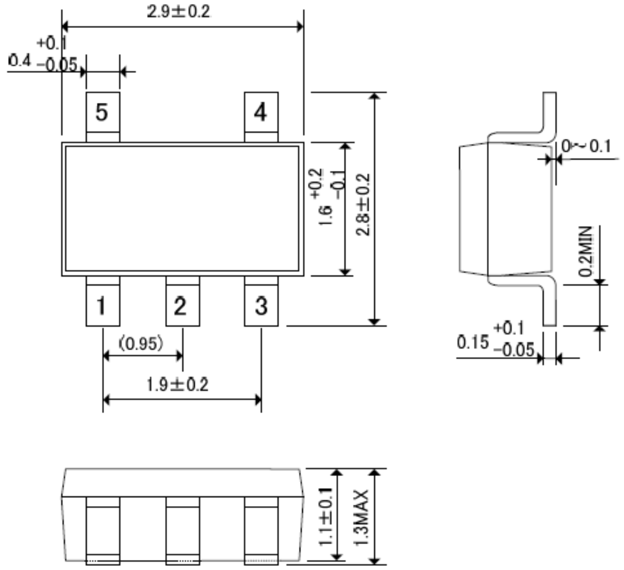
*1) The "-G" suffix denotes halogen and antimony free, as well as being fully ROHS compliant.

*2) ±1% accuracy can be set at $V_{OUT(T)}$ > 2.0 V

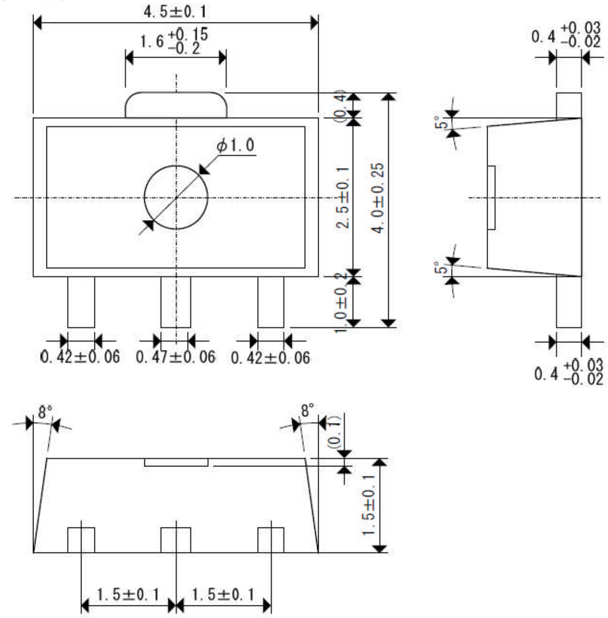
PACKAGE DRAWING AND DIMENSIONS

Units: mm

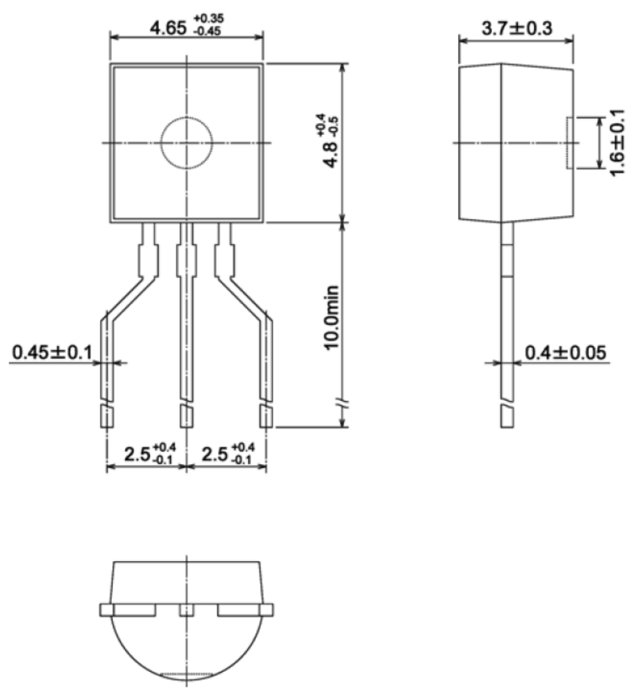
SOT-25



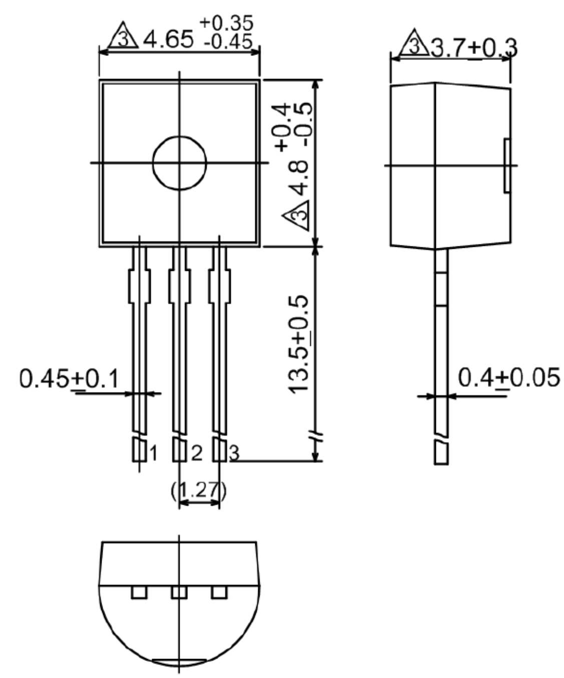
SOT-89



TO-92 Paper tape



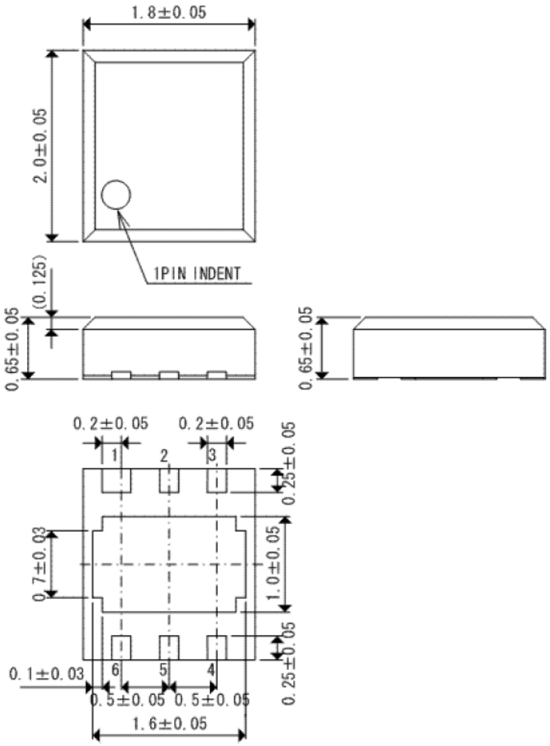
TO-92 Bag



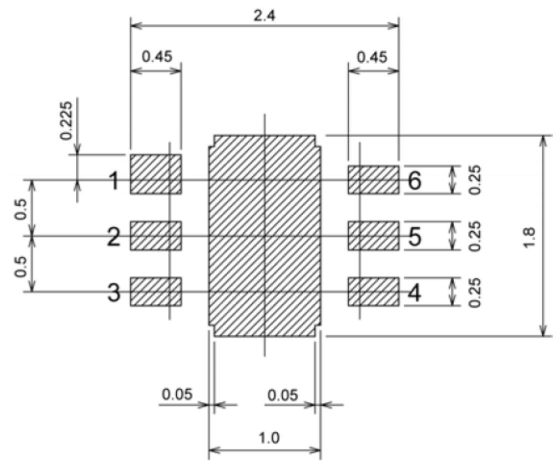
PACKAGE DRAWING AND DIMENSIONS

Units: mm

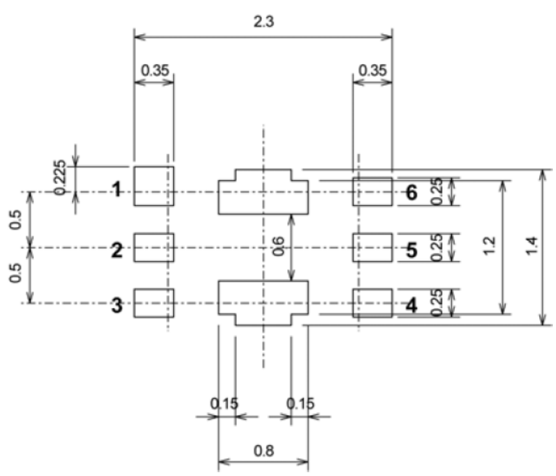
USP-6B



USP-6B Reference Pattern Layout

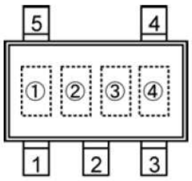


USP-6B Reference Metal Mask Design

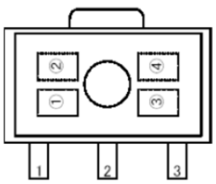


MARKING

SOT-25, SOT 89



SOT-25 (TOP VIEW)



SOT-89 (TOP VIEW)

① - represents product series

MARK	PRODUCT SERIES
1	IXD1201xxxxxx

② - represents type of regulator

MARK		PRODUCT SERIES
Voltage 0.1 – 3.0 V	Voltage 3.1 – 6.0 V	
5	6	IXD1201Pxxxxx
8	9	IXD1201Txxxxx

③ - represents output voltage

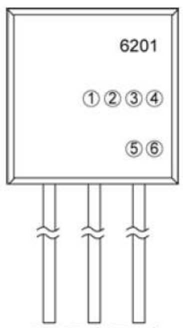
MARK	OUTPUT VOLTAGE	
0		3.1
1		3.2
2		3.3
3		3.4
4		3.5
5		3.6
6		3.7
7		3.8
8		3.9
9		4.0
A		4.1
B		4.2
C	1.3	4.3
D	1.4	4.4
E	1.5	4.5

MARK	OUTPUT VOLTAGE	
F	1.6	4.6
H	1.7	4.7
K	1.8	4.8
L	1.9	4.9
M	2.0	5.0
N	2.1	5.1
P	2.2	5.2
R	2.3	5.3
S	2.4	5.4
T	2.5	5.5
U	2.6	5.6
V	2.7	5.7
X	2.8	5.8
Y	2.9	5.9
Z	3.0	6.0

④ - represents production lot number 0 to 9, A to Z repeated (G, I, J, O, Q, W excluded)

MARKING (Continue)

TO-92



TO-92 (T Type)
(SIDE VIEW)

① - represents type of regulator

MARK	PRODUCT SERIES
P	IXD1201Pxxxxxx
T	IXD1201Txxxxxx

②③ - represents output voltage

MARK		VOLTAGE, V	PRODUCT SERIES
②	③		
3	3	3.3	IXD1201x33xxx
5	0	5.0	IXD1201x50xxx

④ - represents voltage accuracy

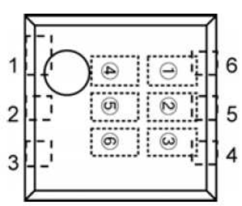
MARK	VOLTAGE ACCURACY, %	PRODUCT SERIES
1	±1	IXD1201xxx1xx
2	±2	IXD1201xxx2xx

⑤ - represent least significant digit of the production year

MARK	PRODUCTION YEAR
2	2012
3	2013

⑥ − represents production lot number 0 to 9, A to Z repeated (G, I, J, O, Q, W excluded)

USP-6B



USP-6B
(TOP VIEW)

①② - represents product series

MARK		PRODUCT SERIES
①	②	
0	1	IXD1201xxxxDx

③ - represents type of regulator

MARK	TYPE	PRODUCT SERIES
P	3-pin Regulator	IXD1201PxxxDx
T	3-pin Regulator rated up to V_{IN} = 7 V	IXD1202TxxxDx

④⑤ - represents output voltage

MARK		VOLTAGE, V	PRODUCT SERIES
④	⑤		
3	3	3.3	IXD1201x33xDx
5	0	5.0	IXD1201x50xDx

⑥ − represents production lot number 0 to 9, A to Z repeated (G, I, J, O, Q, W excluded

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