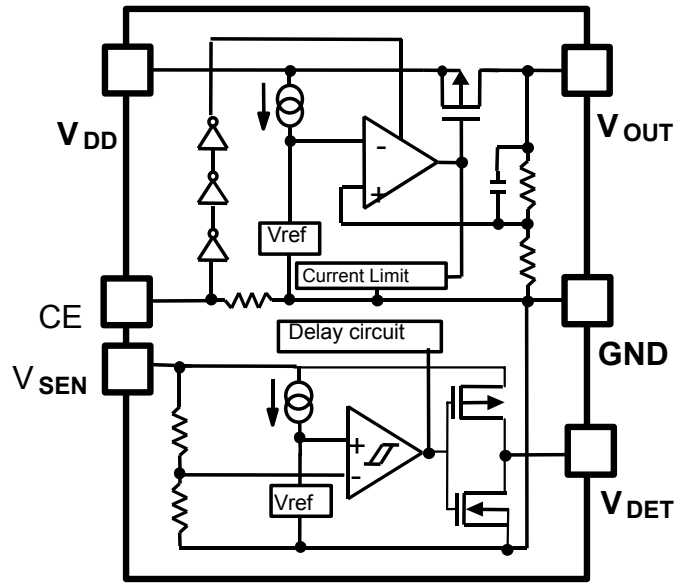
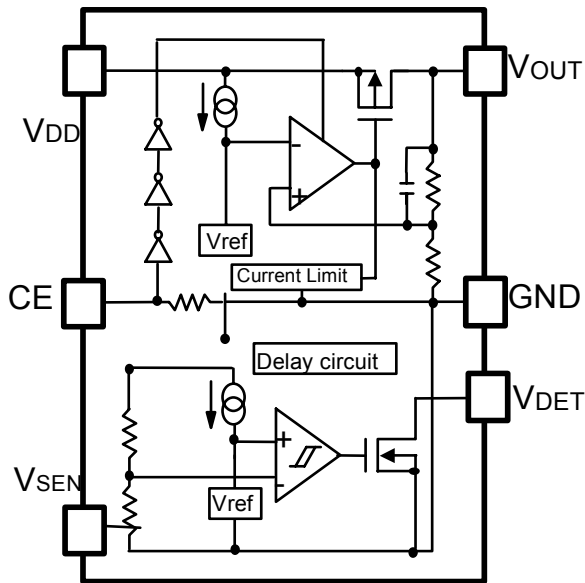




## ■ BLOCK DIAGRAMS



\*In case 5-pin package is selected, Vsen is connected to VDD or VOUT inside the chip.

## ■ SELECTION GUIDE

The output voltage setting code number, hysteresis, output delay time, Vsense connection option, the detector output type, the taping type can be selected at the user's request. The selection can be made by designating the part number as follows;

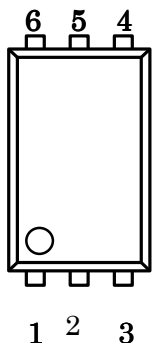
R5511XXXXXX-XX ← Part Number  
 ↑ ↑ ↑ ↑ ↑  
 a b c d e

Code	Contents
a	Designation of the package: H:SOT-89-5, D: SON6, N: SOT23-5
b	Designation of option; Serial number code of Output voltage and Detector Threshold setting, with/without hysteresis
c	Designation of Output Delay Time; A: 1ms, B: 20ms, C: 60ms, D: 240ms
d	Designation of Supervised pin, Detector Output type A: VDD monitor Nch Open drain (5-pin package) B: VOUT monitor Nch Open drain (5-pin package) C: VSEN monitor Nch Open drain (6-pin package) D: VSEN monitor CMOS Output (6-pin package)
e	Designation of Taping Type

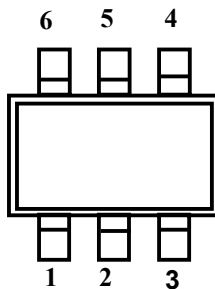
\*With Hysteresis / No delay time version can be designated.

## ■ PIN CONFIGURATION

\*SON6

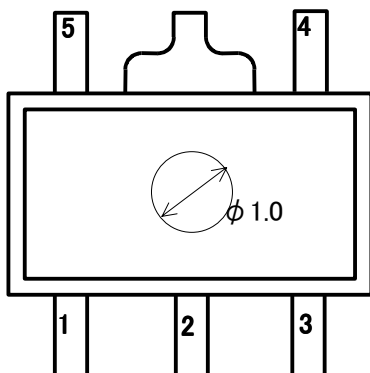


\*SOT-23-6



Pin No.	Symbol	Pin No.	Symbol
1	CE	1	CE
2	GND	2	GND
3	VOUT	3	VDET
4	VDD	4	VDD
5	VSEN	5	VOUT
6	VDET		

\*SOT89-5



Pin No.	Symbol
1	VDET
2	GND
3	CE
4	VOUT
5	VDD

## ■ PIN DESCRIPTION

Symbol	Description
VOUT	Voltage Regulator Output Pin
VDD	Input and Sense Pin of Voltage Detector
GND	Ground Pin
VDET	Voltage Detector Output Pin (When the voltage detector detects the lowering voltage than setting threshold level, the output voltage level is "L". While VDD Input Level at reset detection or before crossing threshold level from higher voltage than it, the output voltage level is "H".)
CE	Chip Enable Pin
VSEN	VDET Sense Pin (In case of 5-lead packages, VSEN is connected VDD or VOUT inside the package.)

## ■ ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Rating	Unit
Input Voltage	V <sub>IN</sub>	6.5	V
Input Voltage(CE Input Pin)*Note	V <sub>CE</sub>	6.5	V
Input Voltage(V <sub>SEN</sub> Pin)	V <sub>SEN</sub>	6.5	V
Output Voltage(V <sub>DET</sub> Output pin)	V <sub>DET</sub>	CMOS Output: -0.3 to V <sub>in</sub> +0.3 Nch Open Drain: -0.3 to 6.5	V
Output Voltage	V <sub>OUT</sub>	-0.3 ~ V <sub>IN</sub> +0.3	V
Output Current	I <sub>OUT</sub>	400	mA
Power Dissipation	PD	SON6: 150 SOT23-5: 250 SOT-89-5: 500	mW
Operating Temperature	T <sub>opt</sub>	-40 ~ 85	°C
Storage Temperature	T <sub>stg</sub>	-55 ~ 125	°C

## R5511

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input Voltage	V <sub>IN</sub>				6.0	V
Quiescent Current 1	ISS1	V <sub>IN</sub> -V <sub>OUT</sub> =1.0V		50	80	μA
Quiescent Current 2	ISS2	V <sub>IN</sub> =-V <sub>DET</sub> -0.1V, V <sub>CE</sub> =0V		1.5	3.0	μA
Quiescent Current 3	ISS3	V <sub>IN</sub> =-V <sub>DET</sub> +1.0V, V <sub>CE</sub> =0V		1.5	3.0	μA

## ■ ELECTRICAL CHARACTERISTICS

VR part

(T<sub>opt</sub>=25°C)

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output voltage	V <sub>OUT</sub>	V <sub>IN</sub> -V <sub>OUT</sub> =1.0V I <sub>OUT</sub> =30mA*Note1	x0.985 (-30mV) x0.980		x1.015 (+30mV) x1.020	V
Output Current	I <sub>OUT</sub>	V <sub>IN</sub> -V <sub>OUT</sub> =1.0V		300		mA
Load regulation	$\Delta V_{OUT}/\Delta I_{OUT}$	V <sub>IN</sub> -V <sub>OUT</sub> =1.0V 1mA≤I <sub>OUT</sub> ≤300mA*Note2			5 15	mV
Dropout Voltage	V <sub>DIF</sub>	Refer to the Electrical Characteristics by Output Voltage				V
Line regulation	$\Delta V_{OUT}/\Delta V_{IN}$	I <sub>OUT</sub> =30mA V <sub>OUT</sub> +0.5V≤V <sub>IN</sub> ≤6.0V			0.05 0.15	%/V
Ripple Rejection	RR	f=1kHz, Ripple 0.5Vp-p V <sub>IN</sub> -V <sub>REG1</sub> =1.0V			75	dB
Output Voltage Temperature Coefficient	$\Delta V_{OUT}/\Delta T$	I <sub>OUT</sub> =30mA -40°C≤T <sub>opt</sub> ≤85°C			±100	ppm/°C
Short Current Limit	I <sub>LIM</sub>	V <sub>OUT</sub> =0V			50	mA
Pull-up resistance for CE pin	R <sub>PD</sub>				2 5 14	MΩ
CE Input Voltage "H"	V <sub>CEH</sub>				1.1 V <sub>IN</sub>	V
CE Input Voltage "L"	V <sub>CEL</sub>				0.0 0.3	V

\*Note1: ±1.5%(V<sub>OUT</sub>≥2.0V), 30mV(2.0V>V<sub>OUT</sub>>1.5V), 2.0%(1.5V≥V<sub>OUT</sub>)

\*Note2: Guaranteed by Design.

VD part

(T<sub>opt</sub>=25°C)

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Detector Threshold	-V <sub>DET</sub>	*Note3	x0.985 (-30mV) x0.980		x1.015 (+30mV) x1.020	V
Detector Threshold Hysteresis	V <sub>HYS</sub>	Delay Time: 0ms, 20ms, 60ms	-V <sub>DET</sub> x0.03	-V <sub>DET</sub> x0.05	-V <sub>DET</sub> x0.07	V
Output Current	I <sub>OL</sub>	Refer to Electrical Characteristics by Detector Threshold				mA
	I <sub>OH</sub> (CMOS Output)	Refer to Electrical Characteristics by Detector Threshold				
Minimum Operating Voltage	V <sub>DDL</sub>			0.65	0.80	V
Detector Threshold Temperature Coefficient	Δ-V <sub>DET</sub> /ΔT	-40°C≤T <sub>opt</sub> ≤85°C		±100		ppm /°C
Output Delay Time	t <sub>PLH</sub>	Delay time=1ms	0.5	1.0	2.8	ms
Output Delay Time	t <sub>PLH</sub>	Delay time=20ms	16	20	24	ms
Output Delay Time	t <sub>PLH</sub>	Delay time=60ms	50	60	70	ms
Output Delay Time	t <sub>PLH</sub>	Delay time=240ms	200	240	280	ms

\*Note3: ±1.5%(V<sub>SET</sub>≥2.0V), 30mV(2.0V>V<sub>OUT</sub>>1.5V), 2.0%(1.5V≥V<sub>OUT</sub>)

## ● Electrical Characteristics by Output Voltage

Output Voltage V <sub>OUT</sub> (V)	Condition	Dropout Voltage(mV)	
		V <sub>dif</sub>	
		Typ.	Max.
1.2V≤V <sub>set</sub> <1.5V	I <sub>out</sub> =100mA	180	280
1.5V≤V <sub>set</sub> <1.8V		160	220
1.8V≤V <sub>set</sub> <2.2V		140	200
2.2V≤V <sub>set</sub> <2.8V		120	170
2.8V≤V <sub>set</sub> ≤4.0V		100	150

## ● Electrical Characteristics by Detector Threshold

## ● Nch Open Drain Type

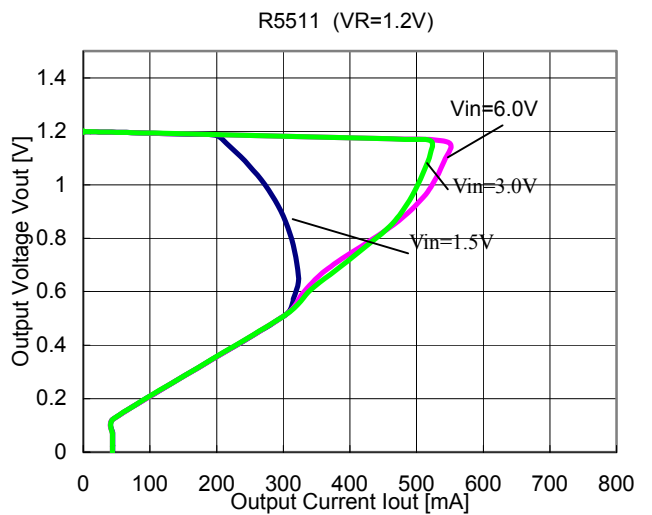
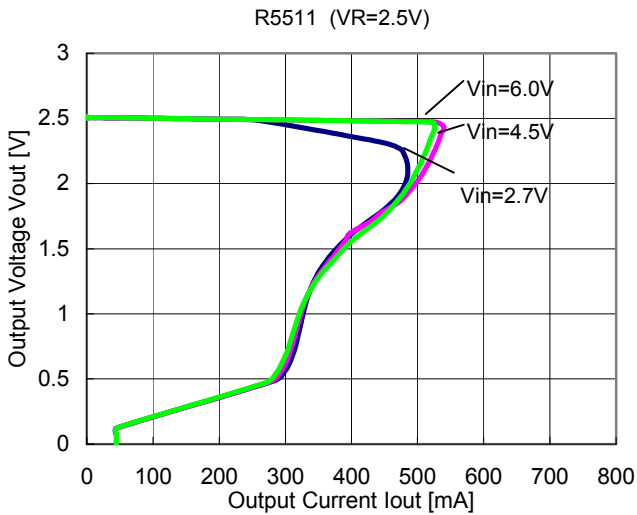
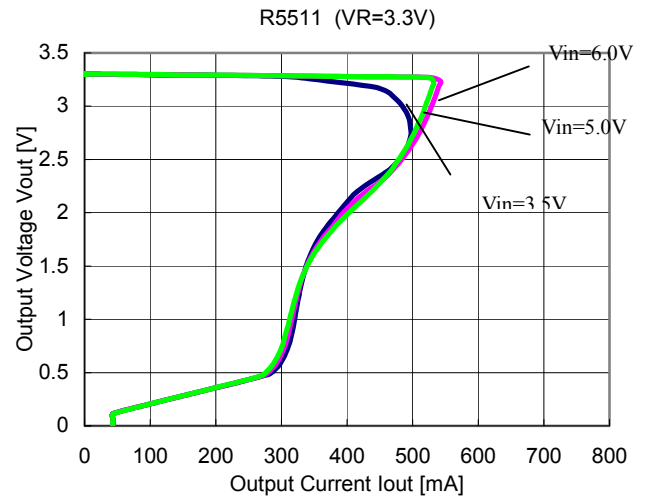
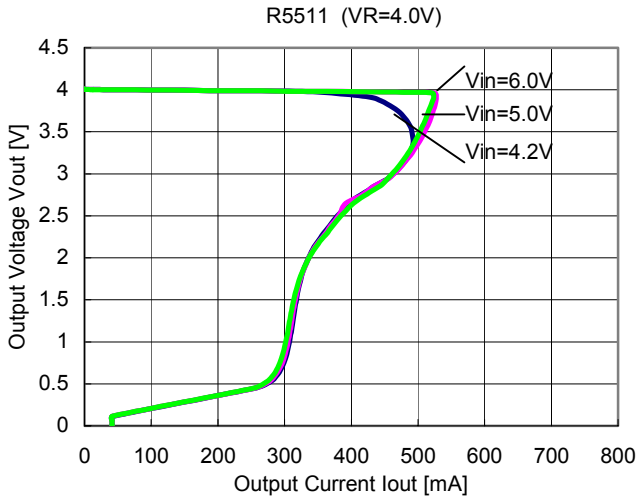
Detector Threshold -V <sub>det</sub> (V)	Output Current(mA)				
	Condition		I <sub>OL</sub>		
			Min.	Typ.	Max.
1.2V≤V <sub>dset</sub> <1.6V	V <sub>DD</sub> =1.1V	V <sub>D</sub> S=0.5V	1.1	2.8	5.0
1.6V≤V <sub>dset</sub> <3.1V	V <sub>DD</sub> =1.5V		3.0	6.0	10.0
3.1V≤V <sub>dset</sub> ≤5.0V	V <sub>DD</sub> =3.0V		8.0	11.0	15.0

## ● CMOS Output Type

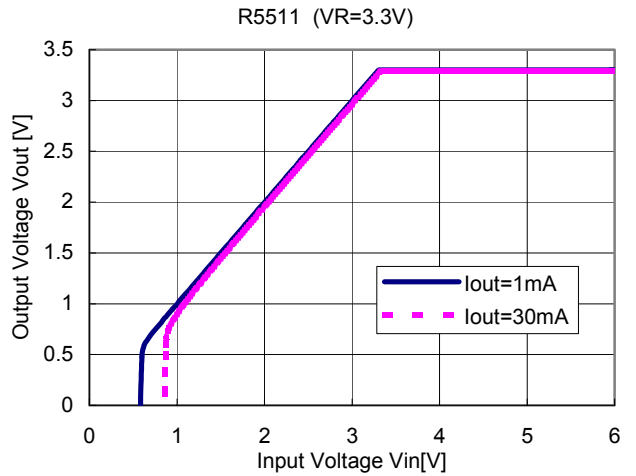
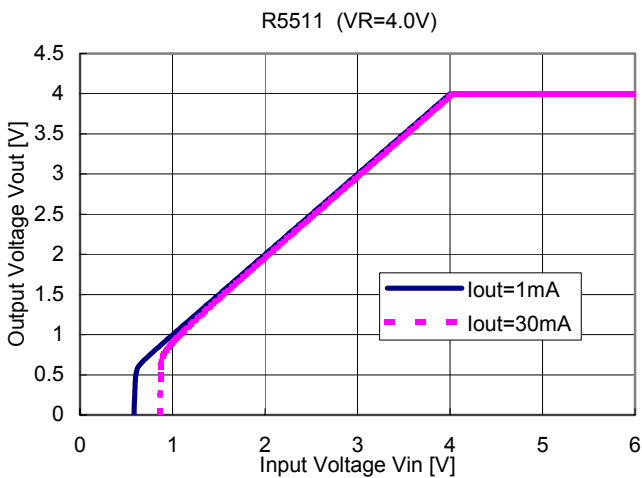
Detector Threshold -V <sub>det</sub> (V)	Output Current (mA)			
	Condition	I <sub>OH</sub>		
		Min.	Typ.	Max.
1.2V≤V <sub>dset</sub> <1.6V, V <sub>S</sub> =1.7V	V <sub>DD</sub> =V <sub>S</sub> V <sub>D</sub> S=V <sub>S</sub> ×0.8	0.10	0.20	0.35
1.6V≤V <sub>dset</sub> <3.1V, V <sub>S</sub> =3.3V		0.55	0.90	1.40
3.1V≤V <sub>dset</sub> ≤5.0V, V <sub>S</sub> =5.4V		1.50	2.10	2.90

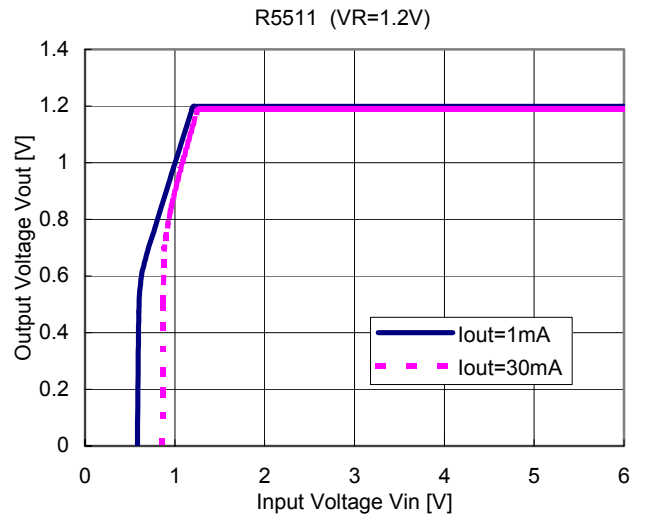
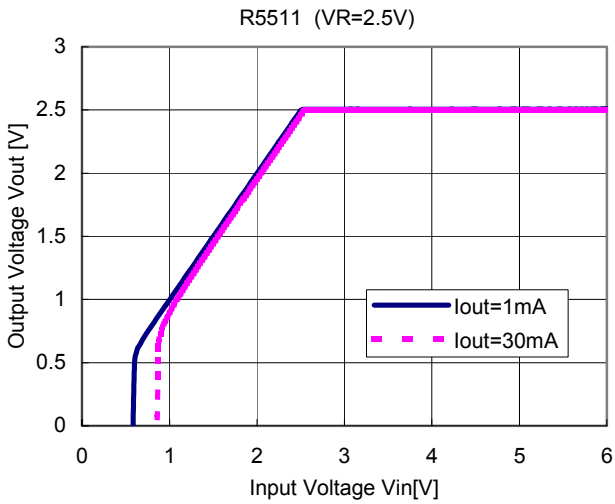
## TYPICAL CHARACTERISTICS

### 1) Output Voltage vs. Output Current (Topt=25°C)

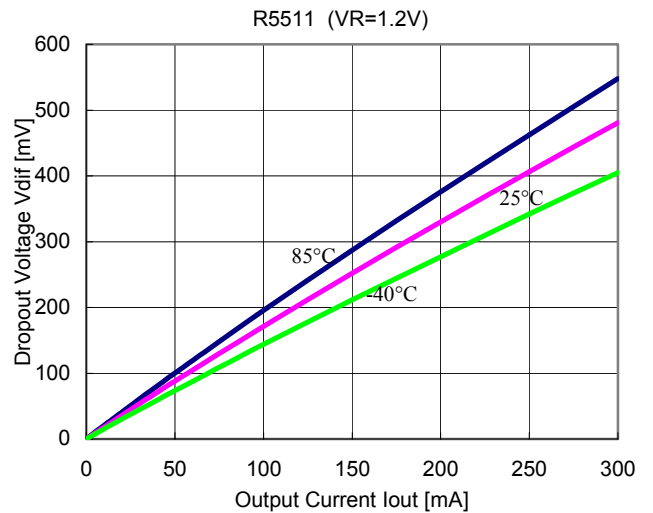
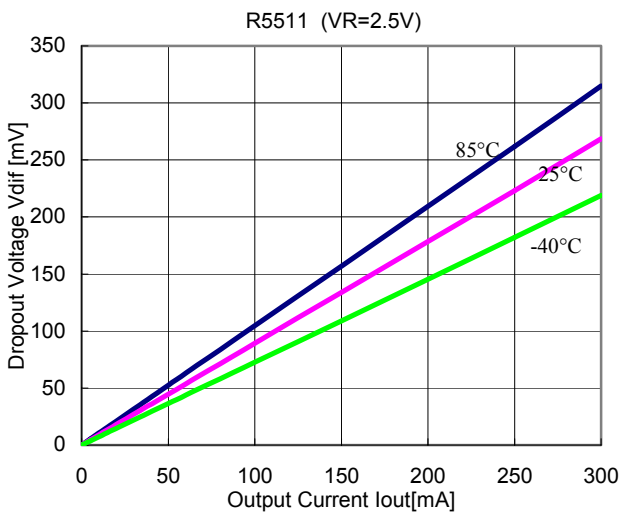
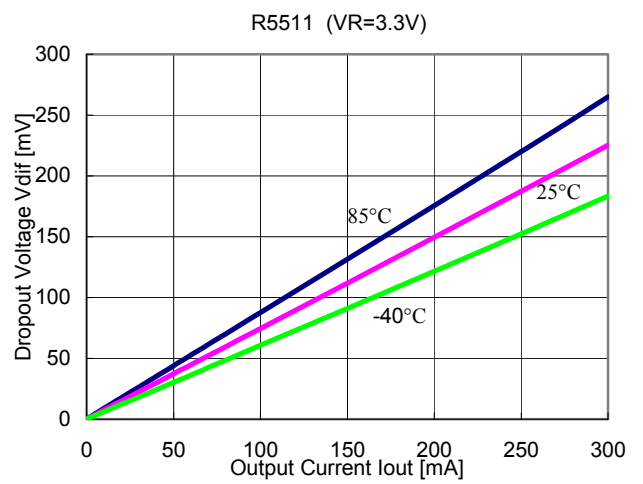
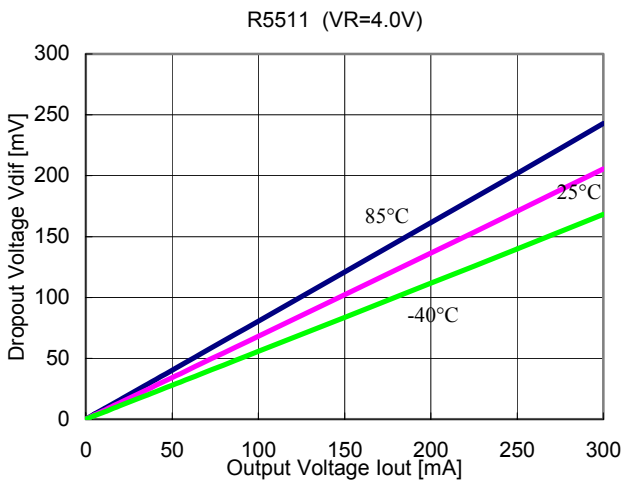


### 2) Input Voltage vs. Output Voltage (Topt=25°C)

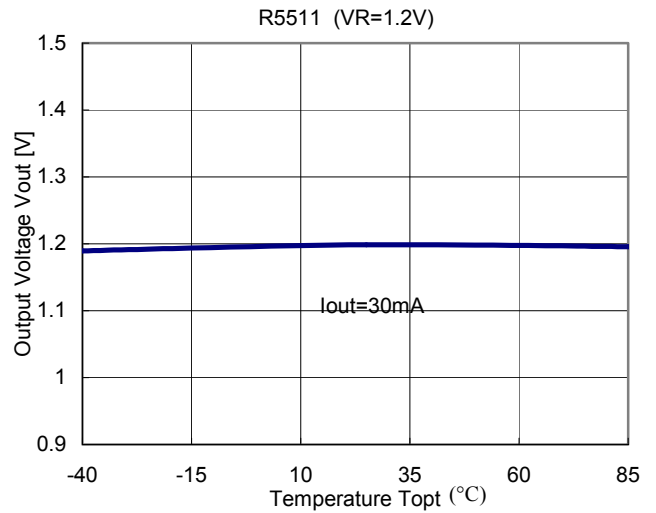
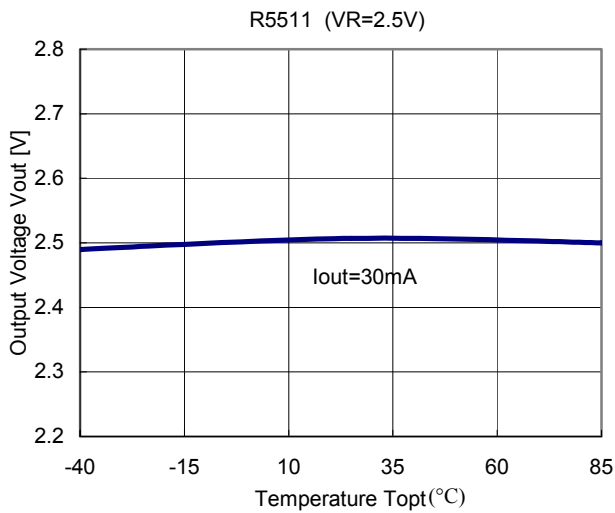
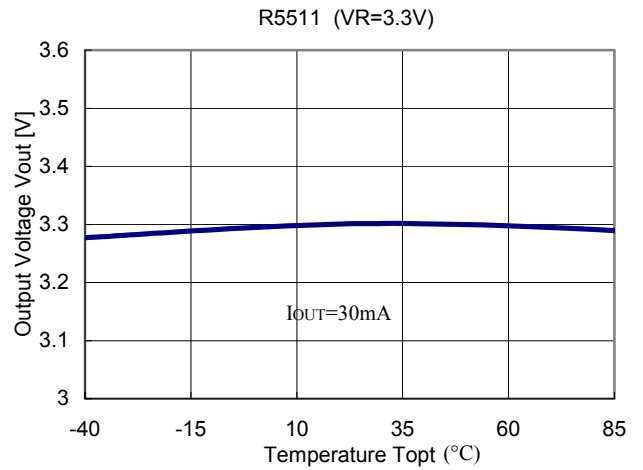
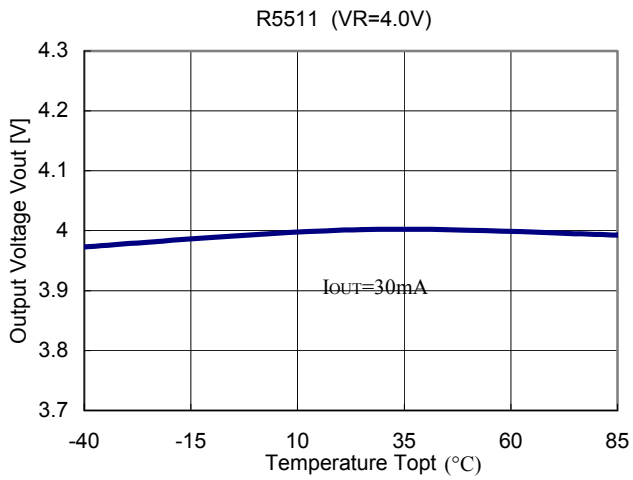




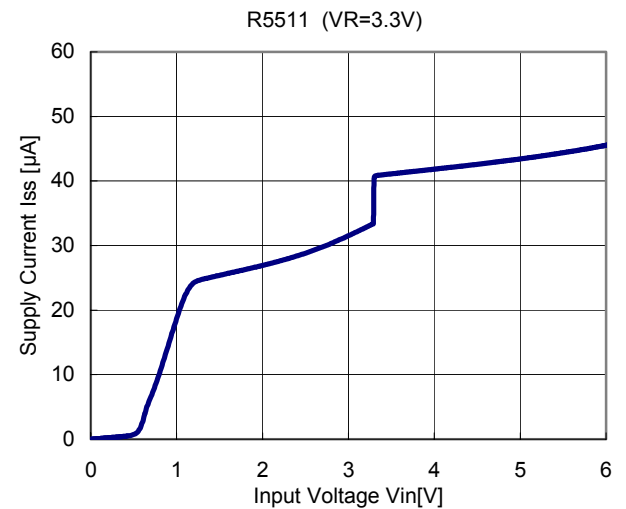
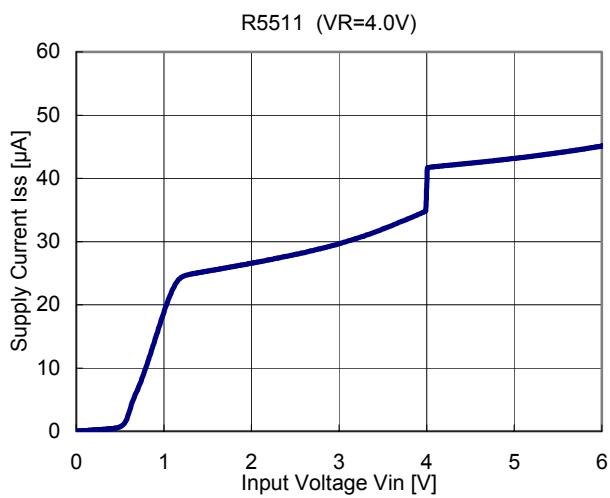
### 3) Dropout Voltage vs. Output Current

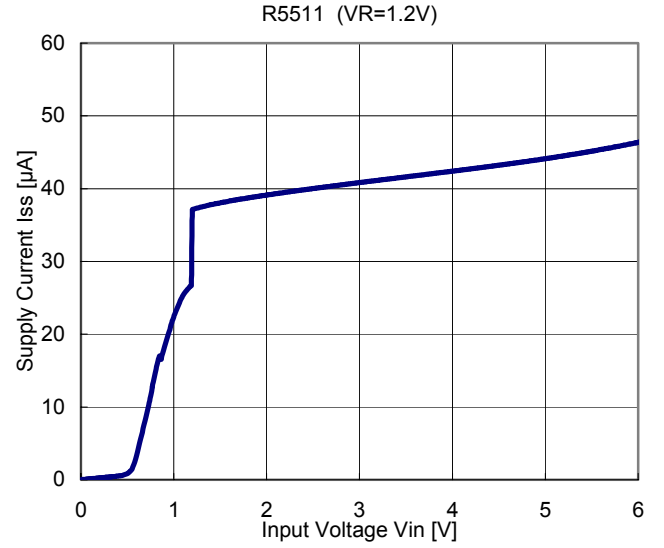
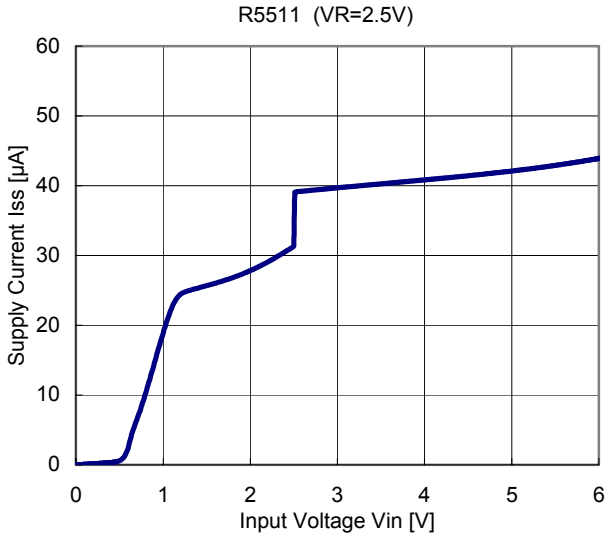


#### 4) Output Voltage vs. Temperature

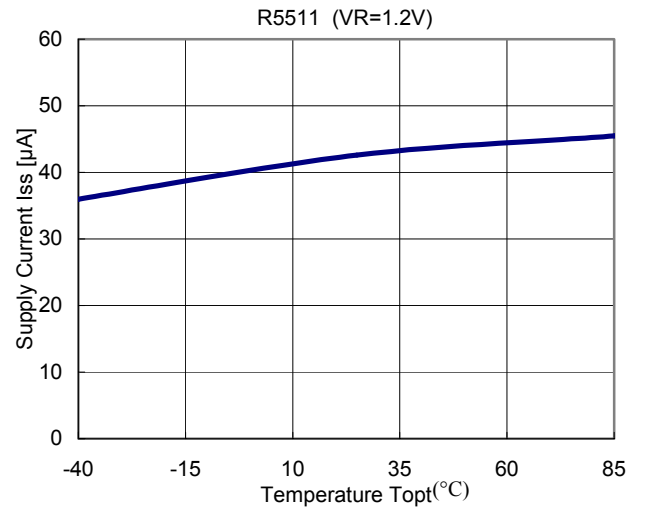
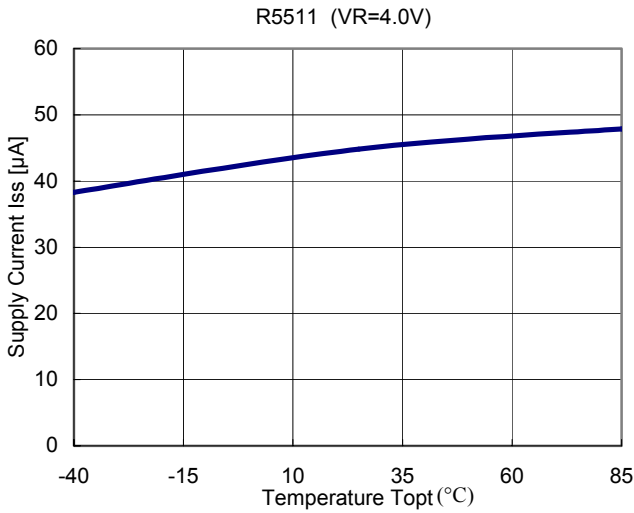


#### 5) Supply Current vs. Input Voltage (Topt=25°C)

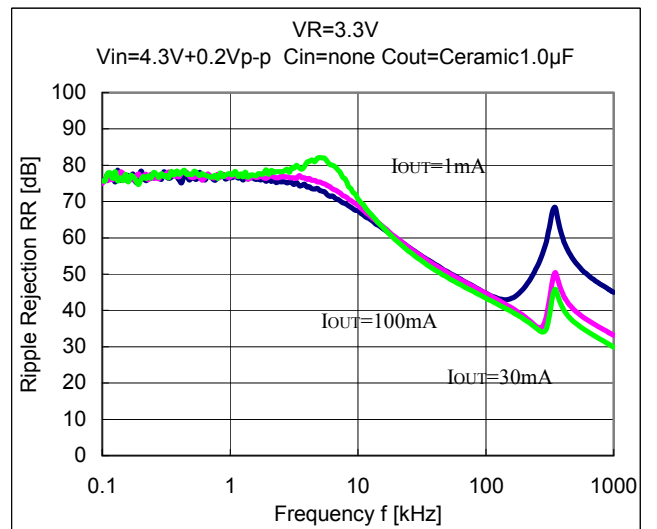
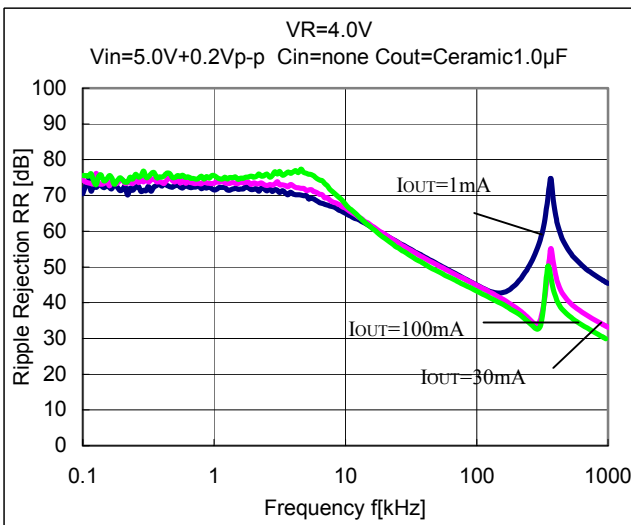


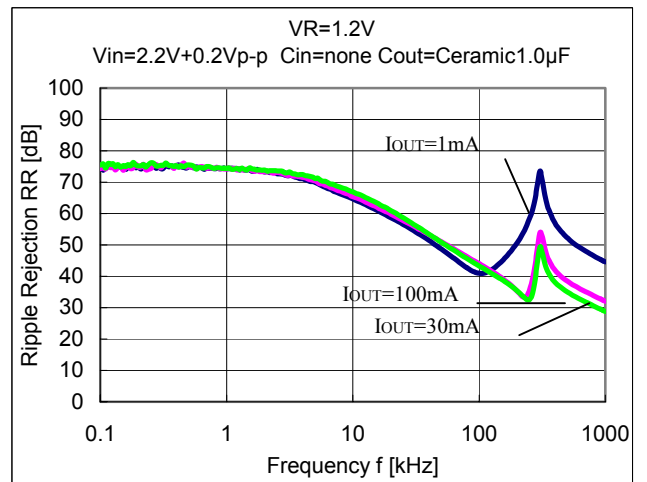
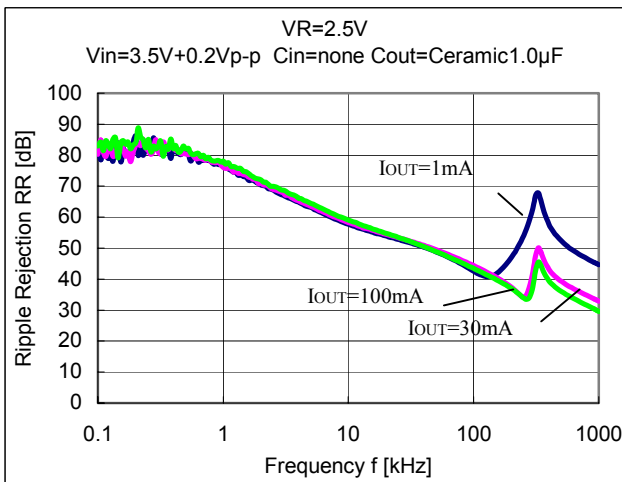


### 6) Supply Current vs. Temperature

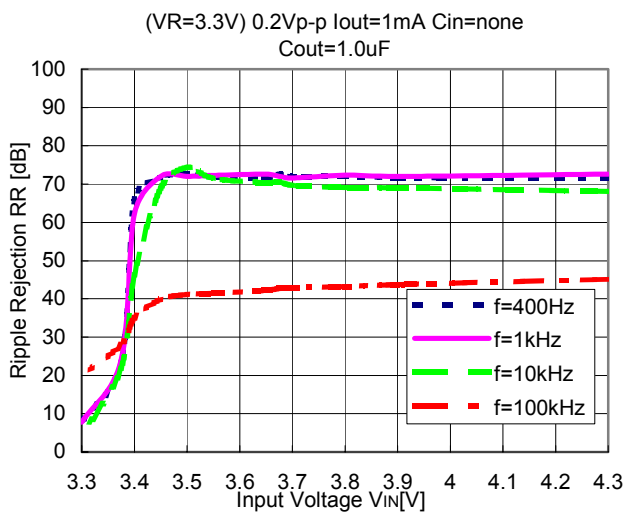
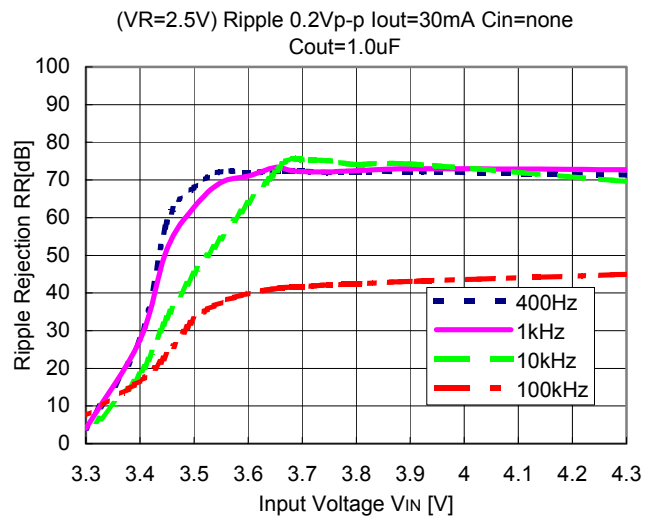
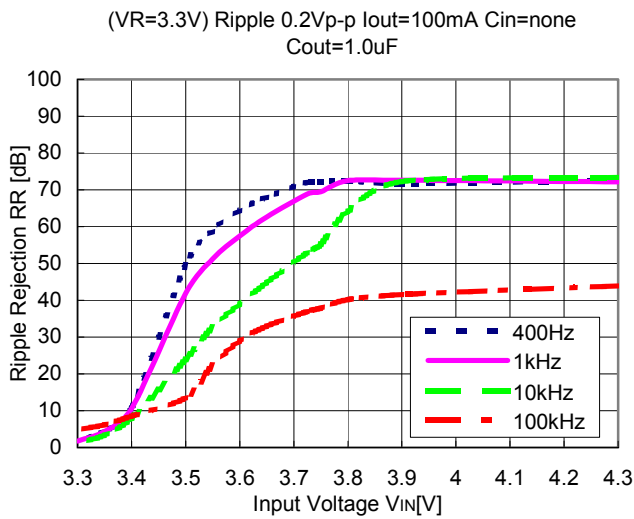


### 7) Ripple Rejection vs. Temperature (T<sub>opt</sub>=25°C)

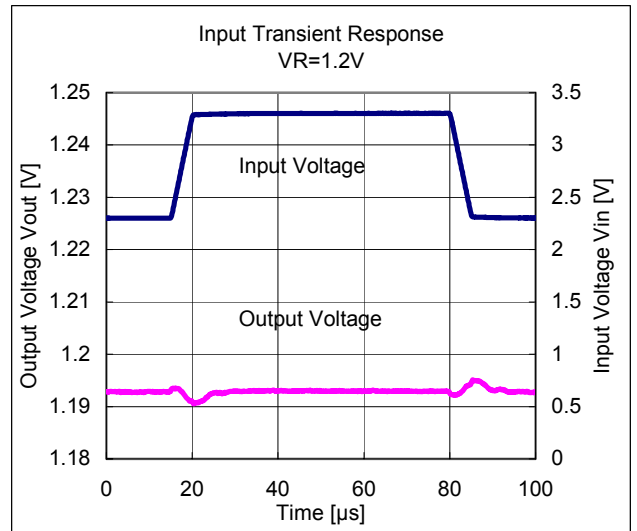
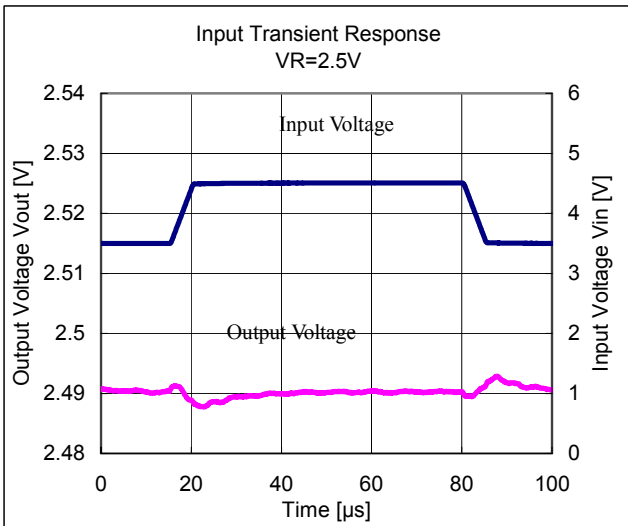
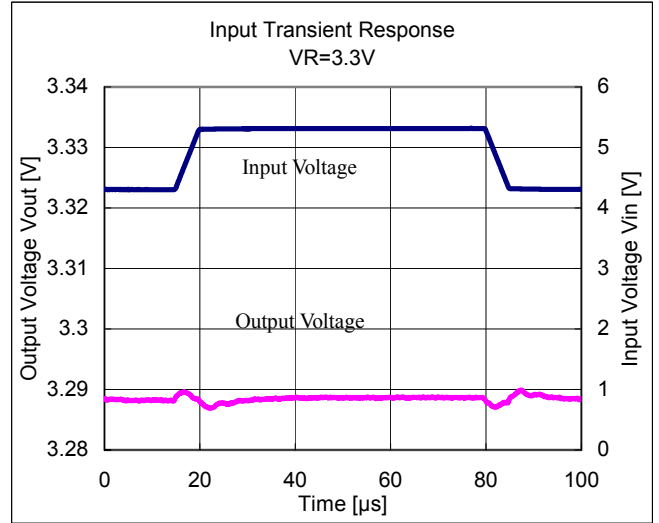
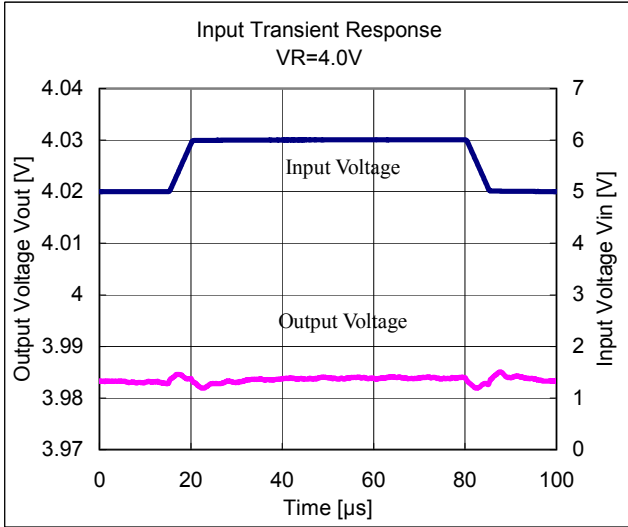




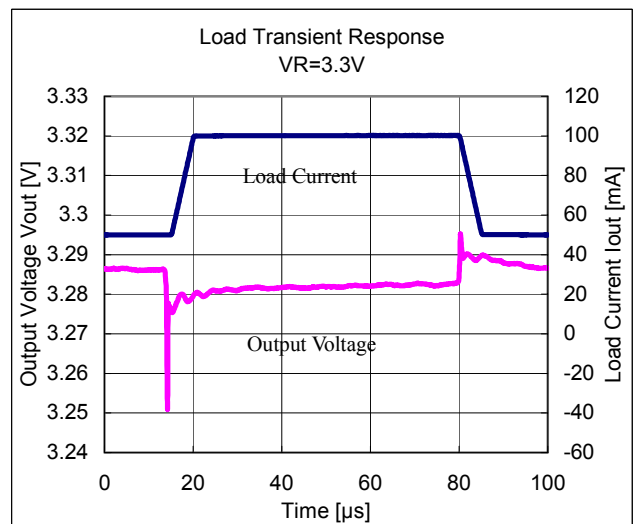
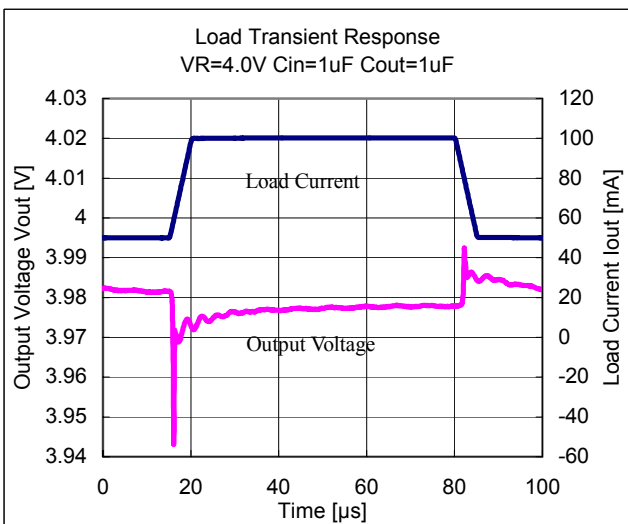
### 8) Ripple Rejection vs. Input Bias Voltage

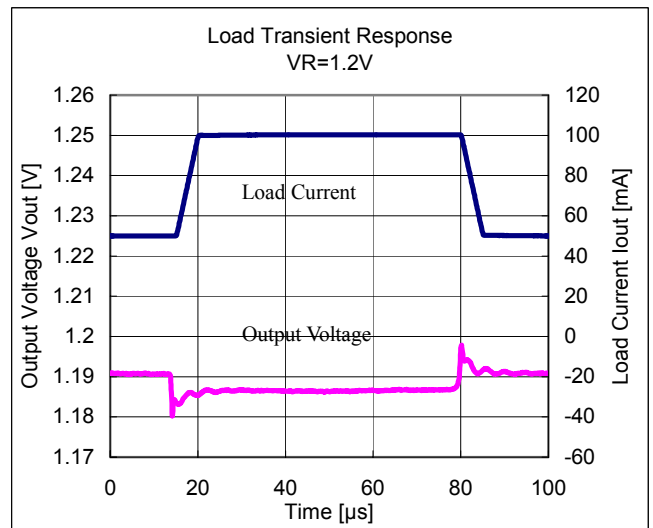
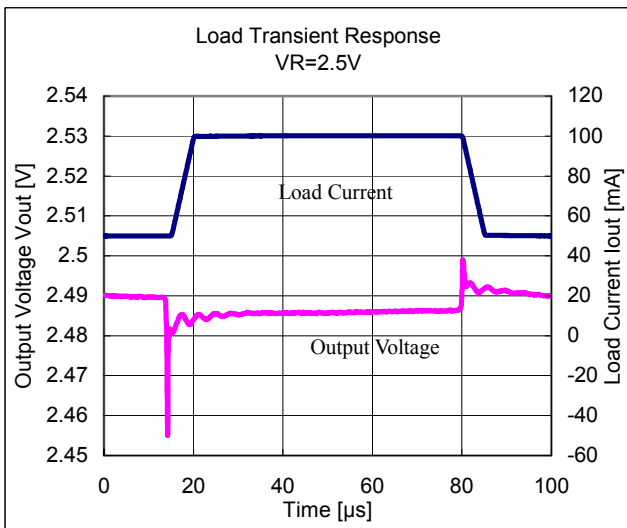


### 9) Input Transient Response

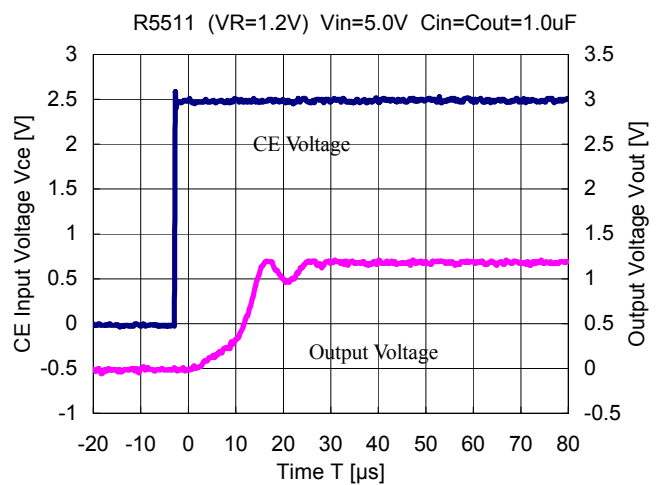
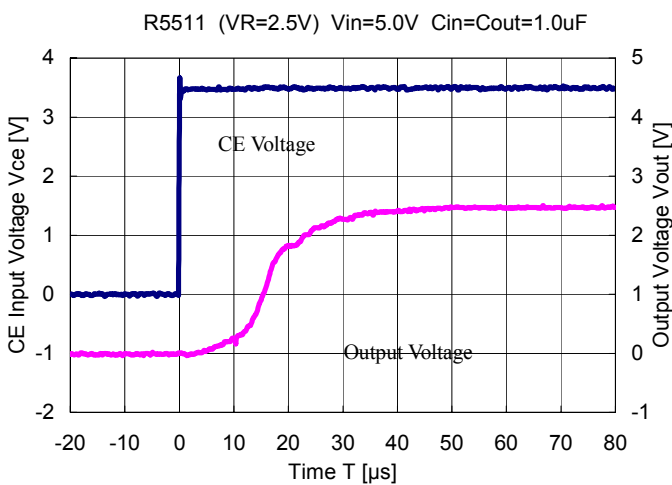
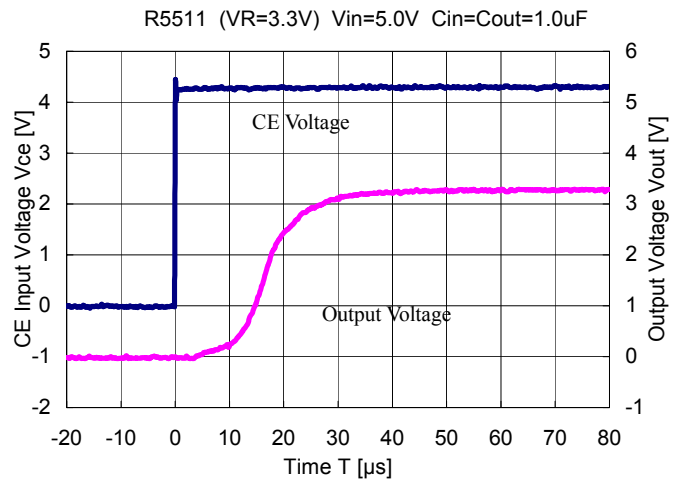
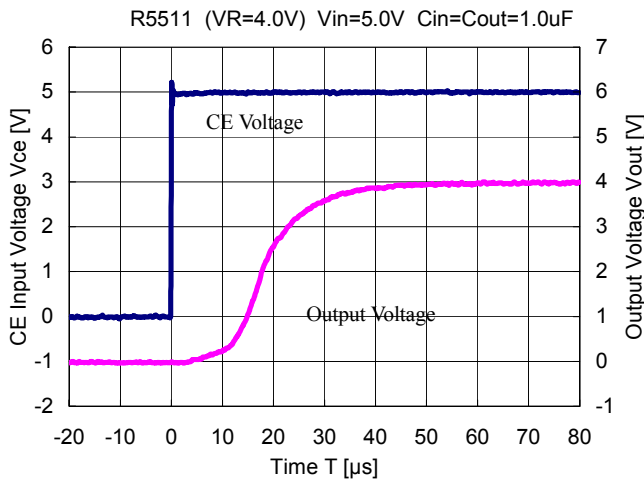


### 10) Load Transient Response

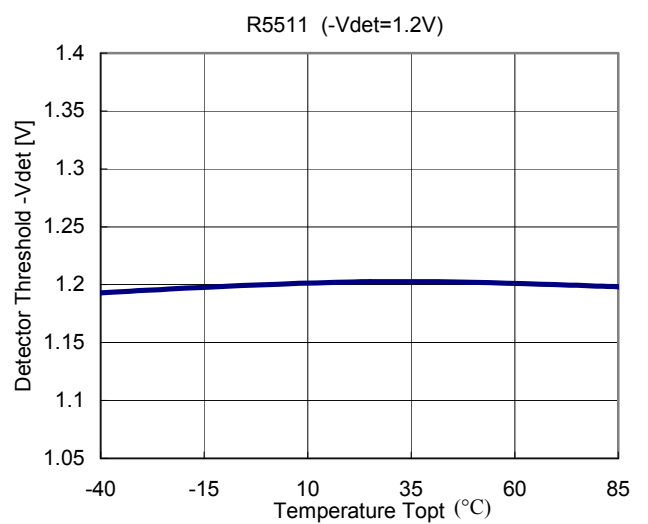
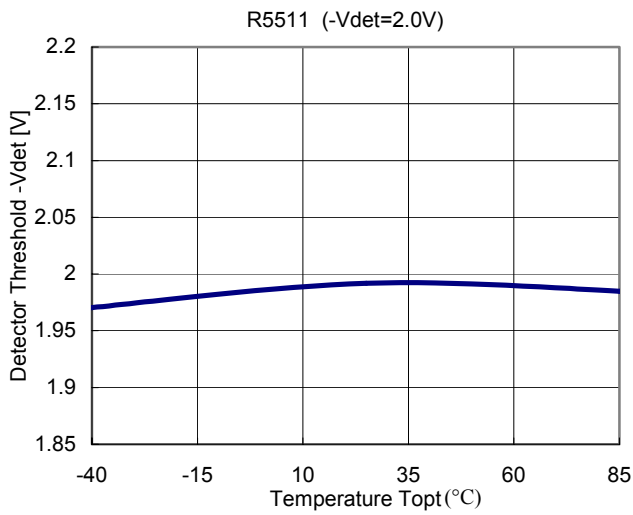
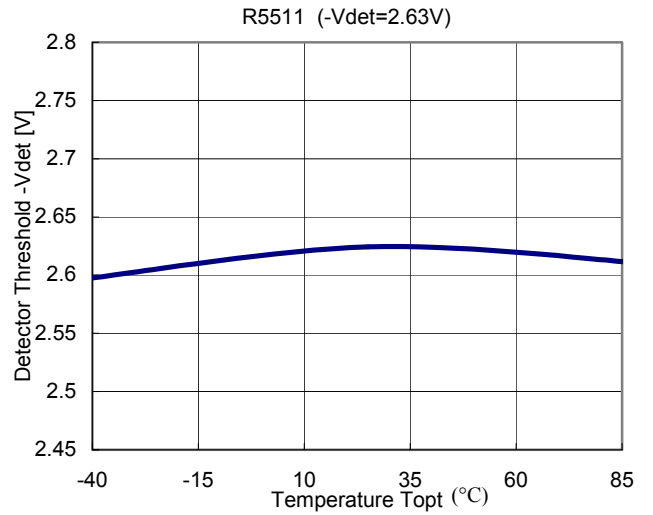
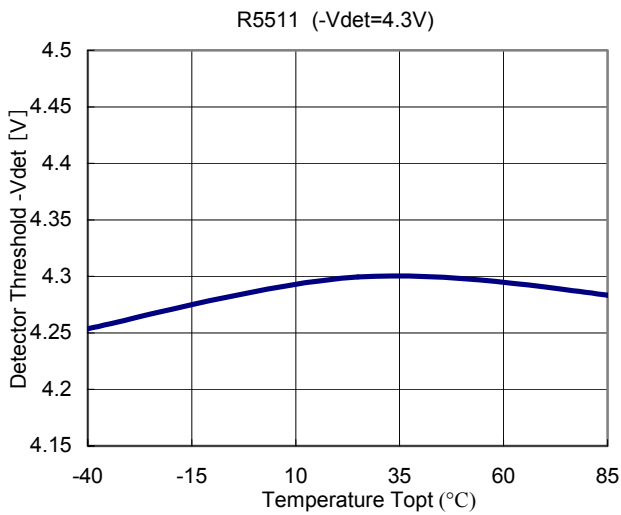




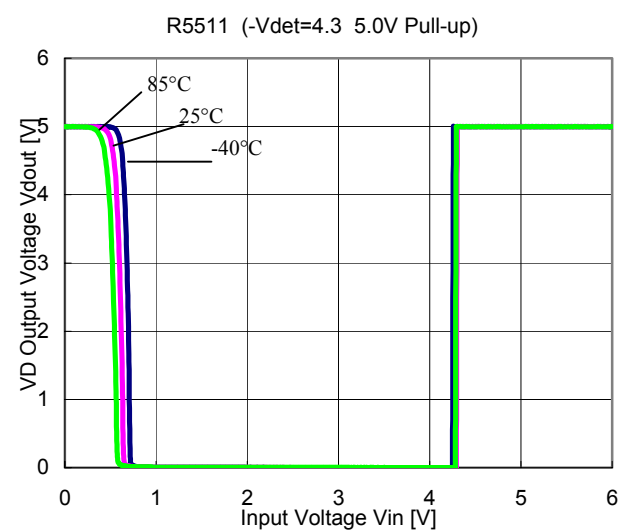
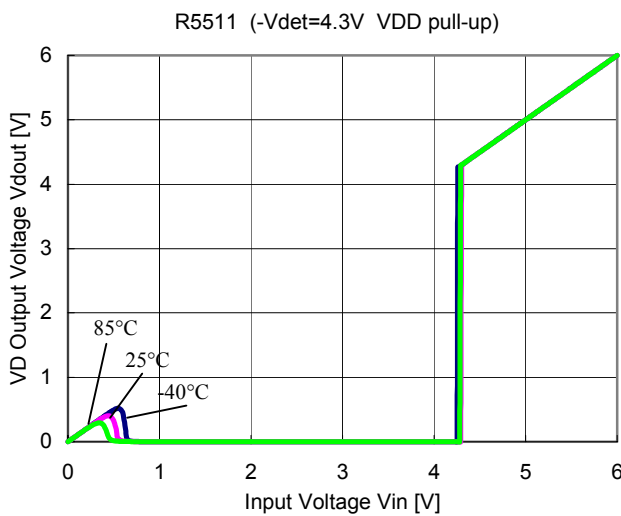
### 11) Turn-on Speed with CE

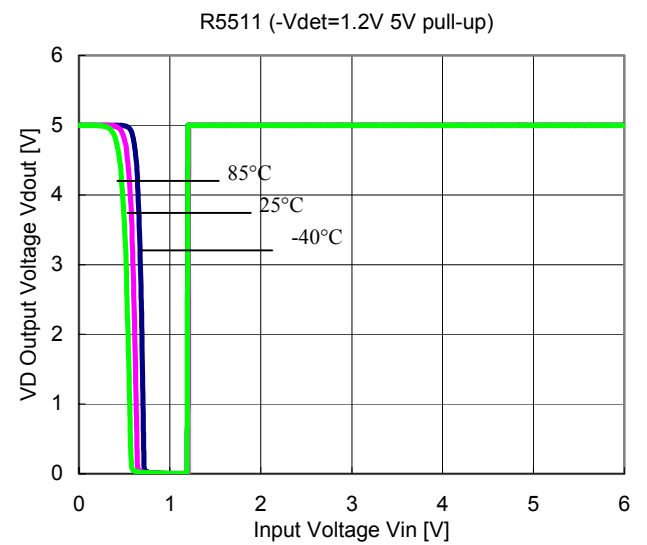
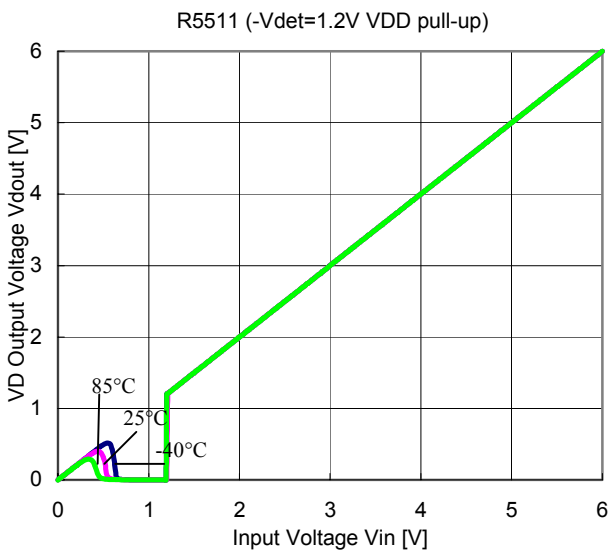
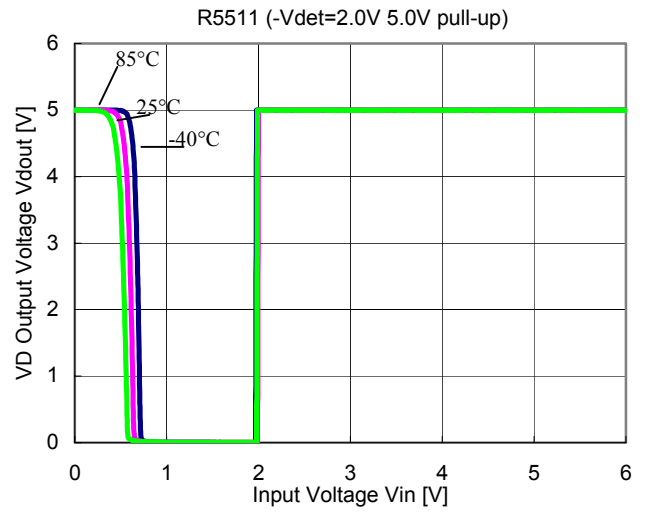
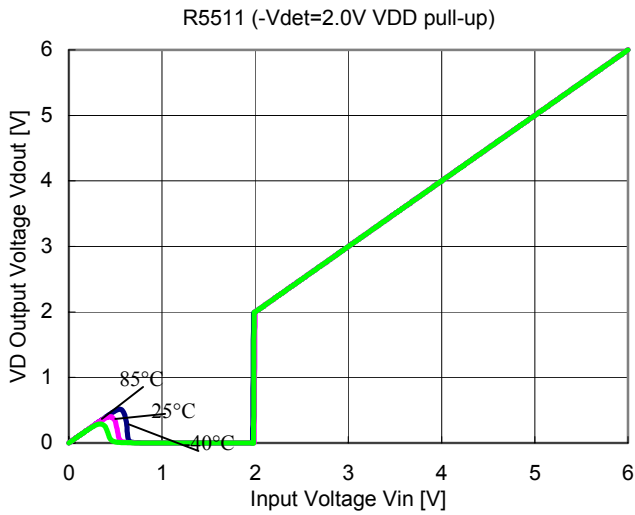
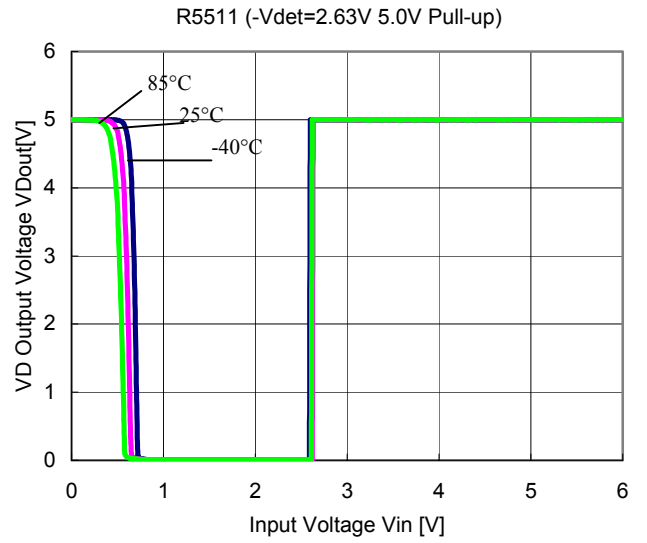
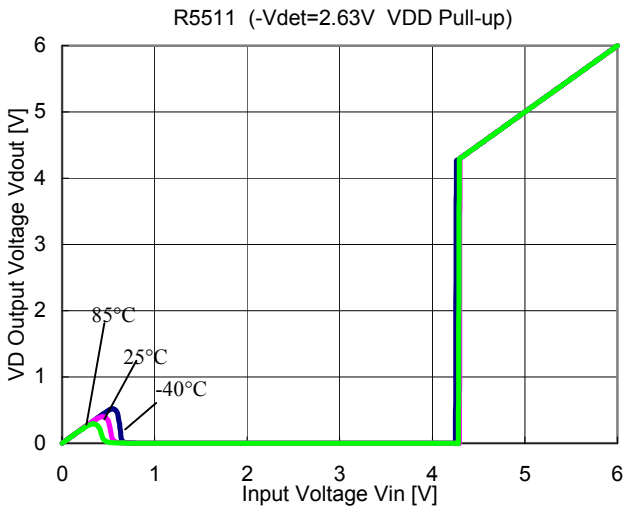


## 12) Detector Threshold vs. Temperature

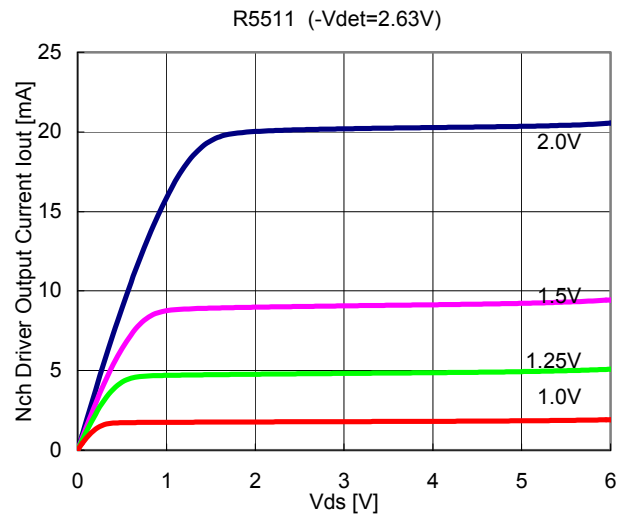
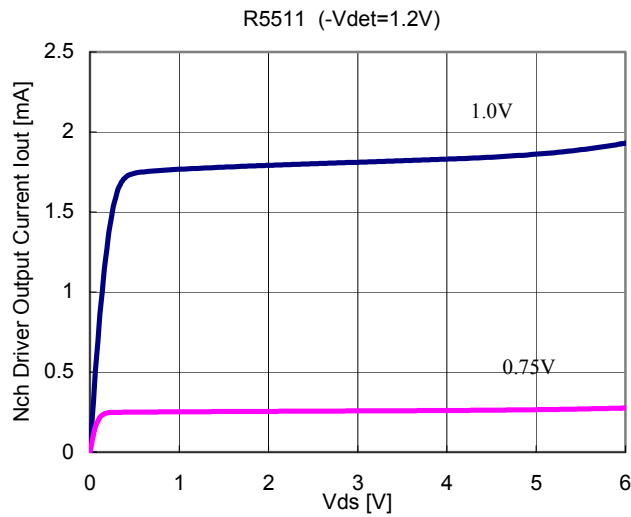
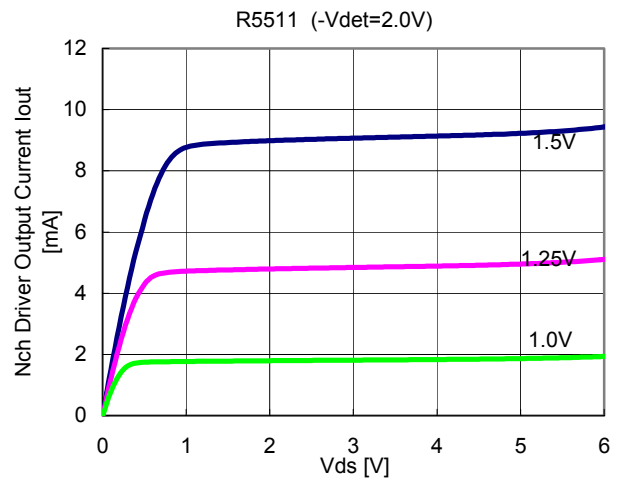
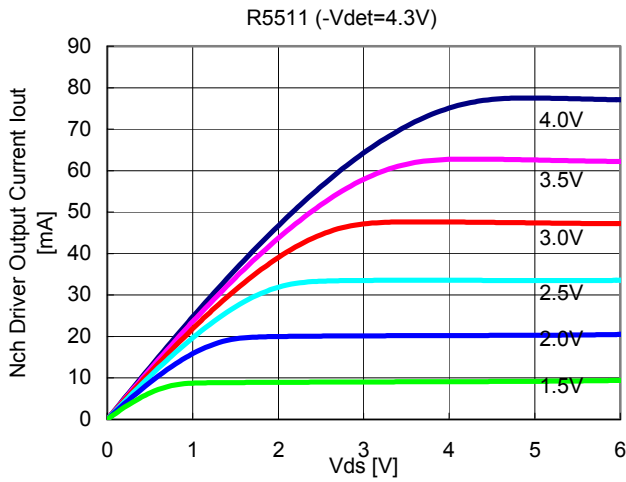


## 13) Detector Output Voltage vs. Input Voltage

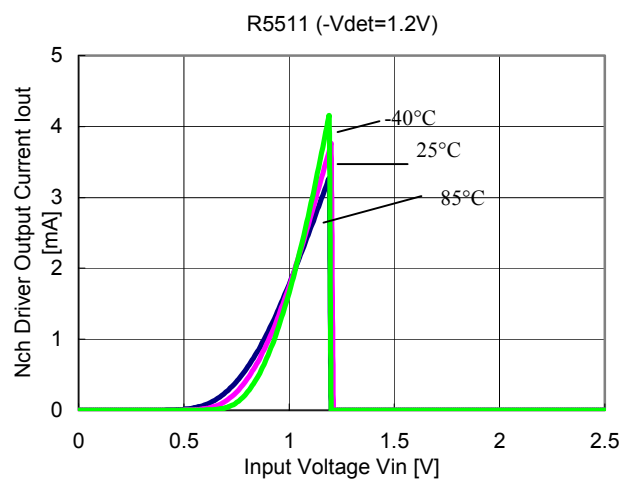
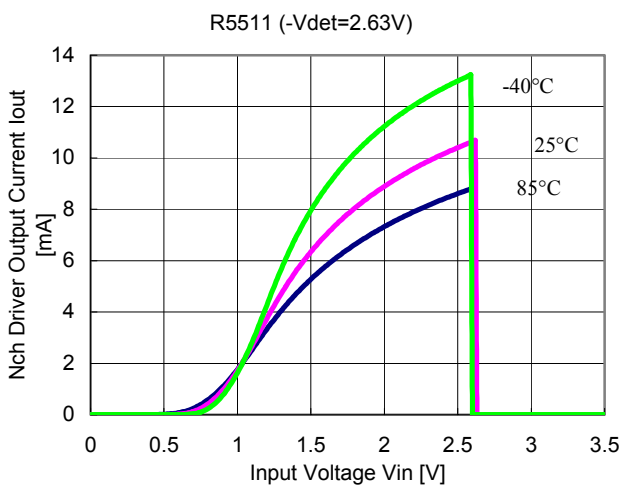


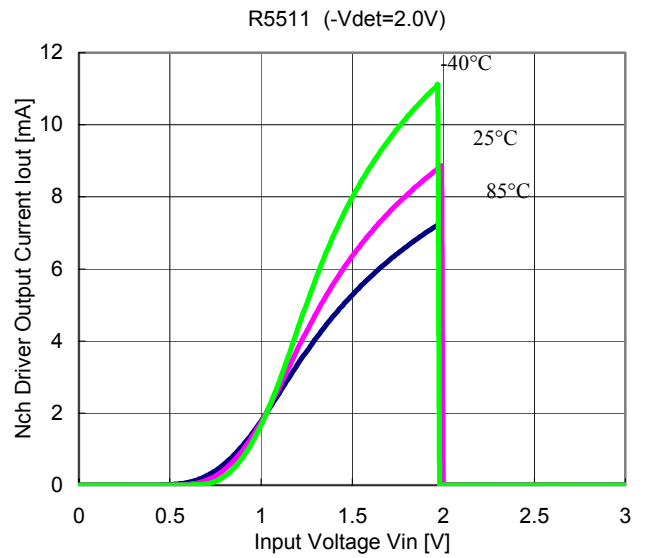
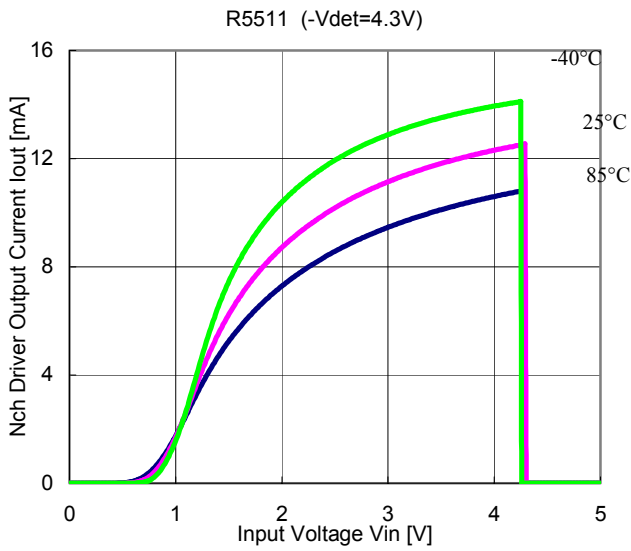


### 14) Nch Driver Output Current vs. Vds



### 15) Nch Driver Output Current vs. Input Voltage





16) Released Delay Time vs. Temperature

