

3A Load Switch IC

NO. EA-312-240326

OUTLINE

The R5527K is an N-channel load switch IC with low supply current, Typ. 40μA. R5527K realizes low on-resistance by using Nch transistor for the driver. In addition, R5527K001x has a reverse current blocking function at on/off state, and R5527K002x has a reverse current blocking function at off state. The R5527K is an ideal load switch IC to supply power from the battery to the load circuit. The R5527K is available in an ultra-small DFN (PL)1612-4D package which can achieve high-density mounting on boards.

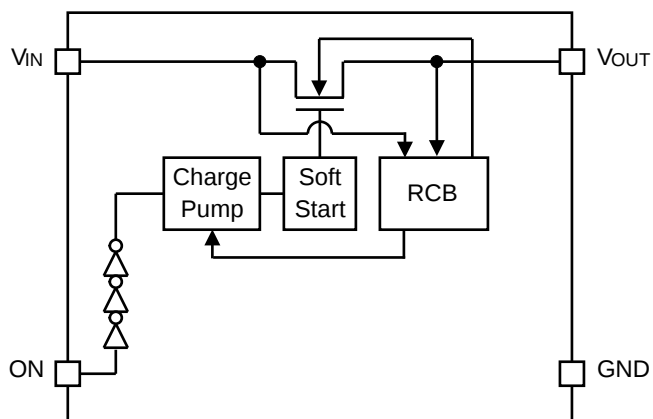
FEATURES

- | | |
|---|------------------------------|
| • Input Voltage Range | 1.8V to 5.5V |
| • Typical On Resistance | 48mΩ (V _{IN} =5V) |
| | 46mΩ (V _{IN} =4.5V) |
| | 45mΩ (V _{IN} =3.8V) |
| | 68mΩ (V _{IN} =1.8V) |
| • Slew Rate/Inrush Control with t _{tr} | Min. 1.5ms |
| • 3A Maximum Continuous Current Capability | |
| • Low Off Switch Current | Max.1μA (R5527K00xB/D) |
| | Max.2μA (R5527K001A/C) |
| • Reverse Current Blocking (RCB) | At Off/On-State (R5527K001x) |
| | At Off-State (R5527K002x) |
| • Package | DFN(PL)1612-4D |

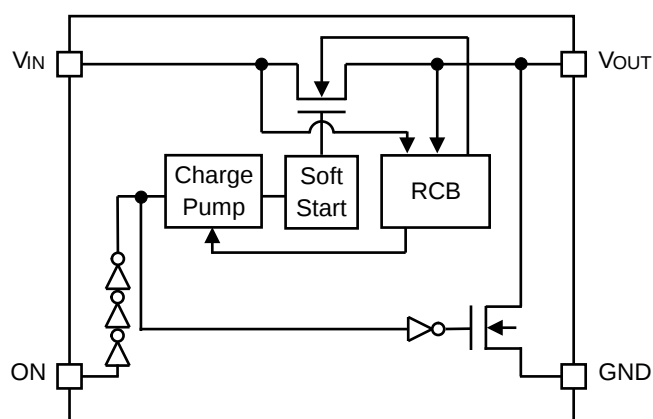
APPLICATION

- Smart Phones, Tablet PCs
- Storage, Portable Devices

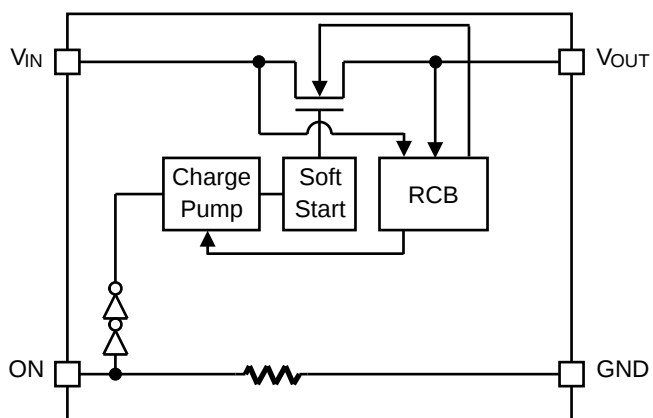
BLOCK DIAGRAMS



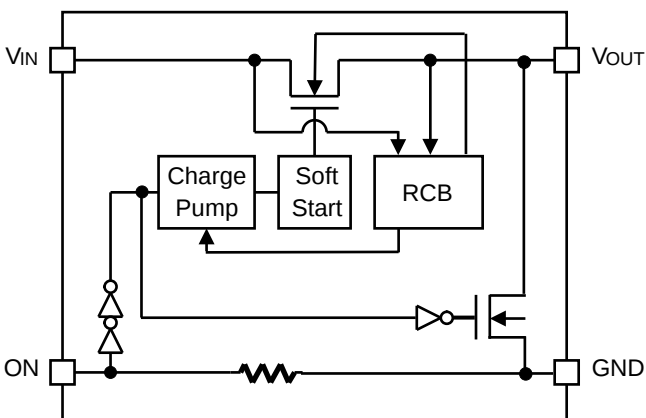
R5527K001A



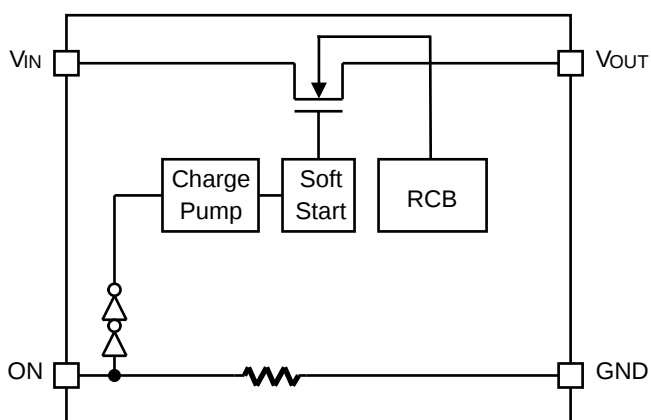
R5527K001C



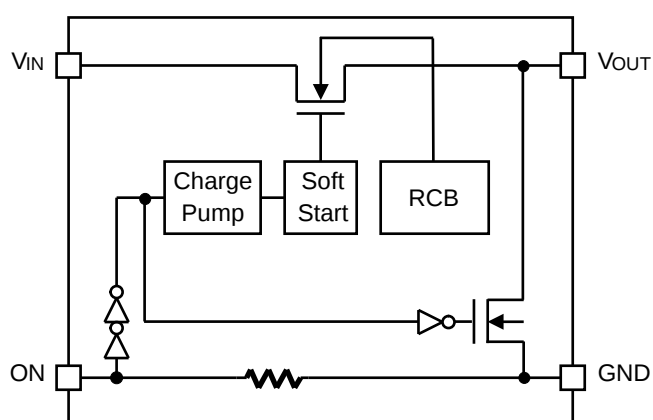
R5527K001B



R5527K001D



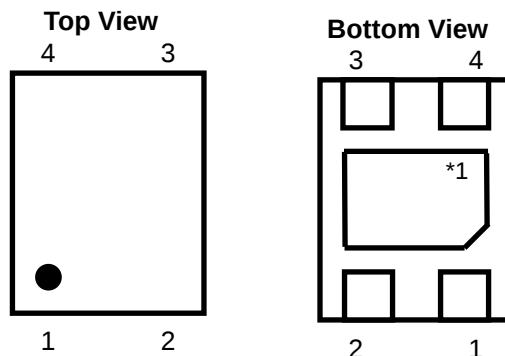
R5527K002B



R5527K002D

PIN DESCRIPTION

• DFN(PL)1612-4D



Pin No	Symbol	Pin Description
1	V_{IN}	Supply Input Pin
2	GND	Ground Pin
3	ON	ON/OFF Control Pin, Active High/Low
4	V_{OUT}	Switch Output Pin

*1 The tab on the bottom of the package enhances thermal performance and is electrically connected to GND (substrate level). It is recommended that the tab be connected to the ground plane on the board, or otherwise be left floating.

SELECTION GUIDE

The ON pin polarity, the auto-discharge function⁽¹⁾ and the reverse current blocking (RCB) at on state for the ICs are user-selectable options.

Product Name	Package	Quantity per Reel	Pb Free	Halogen Free
R5527K00**-TR	DFN(PL)1612-4D	5,000 pcs	Yes	Yes

** : Specify a combination of the ON pin polarity, the auto-discharge function and the RCB at on state .

**	ON pin Polarity	Auto-discharge	RCB at On-State
1A	"L" Active	No	Yes
1B	"H" Active	No	Yes
1C	"L" Active	Yes	Yes
1D	"H" Active	Yes	Yes
2B	"H" Active	No	No
2D	"H" Active	Yes	No

⁽¹⁾ Auto-Discharge function quickly lowers the output voltage to 0V by releasing the electrical charge in the external capacitor when the ON signal is switched from the active mode to the standby mode.

ABSOLUTE MAXIMUM RATINGS

Symbol	Item		Rating	Unit
V_{IN}	Input Voltage		-0.3 to 6.0	V
V_{ON}	Input Voltage (ON Pin)		-0.3 to 6.0	V
V_{OUT}	Output Voltage		-0.3 to 6.0	V
I_{OUT}	Output Current		3.0	A
P_D	Power Dissipation (DFN(PL)1612-4D)*1	JEDEC STD. 51 Test Land Pattern	830	mW
T_a	Ambient Temperature		-40 to 85	°C
T_{stg}	Storage Temperature		-55 to 125	°C

*1 Refer to *PACKAGE INFORMATION* for detailed information.

ABSOLUTE MAXIMUM RATINGS

Electronic and mechanical stress momentarily exceeded absolute maximum ratings may cause the permanent damages and may degrade the life time and safety for both device and system using the device in the field. The functional operation at or over these absolute maximum ratings are not assured.

RECOMMENDED OPERATING CONDITIONS (ELECTRICAL CHARACTERISTICS)

All of electronic equipment should be designed that the mounted semiconductor devices operate within the recommended operating conditions. The semiconductor devices cannot operate normally over the recommended operating conditions, even if when they are used over such conditions by momentary electronic noise or surge. And the semiconductor devices may receive serious damage when they continue to operate over the recommended operating conditions.

ELECTRICAL CHARACTERISTICS

$V_{IN} = 1.8$ to $5.5V$, $I_{OUT} = 1mA$, $C_{IN} = 1\mu F$, $C_{OUT} = \text{None}$, unless otherwise noted.

The specifications surrounded by are guaranteed by design engineering at $-40^{\circ}C \leq T_a \leq 85^{\circ}C$.

R5527K001A

($T_a = 25^{\circ}C$)

Symbol	Item	Conditions	Min.	Typ.	Max.	Unit
V_{IN}	Input Voltage		1.8		5.5	V
$I_{Q(OFF)}$	Off Supply Current	$V_{ON}=V_{IN}, V_{OUT}=OPEN$		1	2	μA
I_{SD}	Shutdown Current	$V_{ON}=V_{IN}, V_{OUT}=GND$		1	2	μA
		$T_a = 85^{\circ}C$		1	10	μA
I_Q	Quiescent Current	$V_{ON}=GND, I_{OUT}=0mA$		40	70	μA
R_{ON}	On Resistance	$V_{IN}=5V, I_{OUT}=1A$		48	65	m Ω
		$V_{IN}=4.5V, I_{OUT}=1A$		46		
		$V_{IN}=3.8V, I_{OUT}=1A$		45	60	
		$V_{IN}=3.3V, I_{OUT}=500mA$		45		
		$V_{IN}=2.5V, I_{OUT}=500mA$		51		
		$V_{IN}=1.8V, I_{OUT}=250mA$		68		
V_{IH}	ON Input Logic High Voltage	$V_{IN}=1.8V$ to $5.5V$	1.7			V
V_{IL}	ON Input Logic Low Voltage	$V_{IN}=1.8V$ to $5.5V$			1.2	V
I_{ON}	ON Input Leakage	$V_{ON}=V_{IN}$			1	μA
V_{T_RCB}	RCB Protection Trip Point	$V_{OUT} - V_{IN}$		45		mV
V_{R_RCB}	RCB Protection Release Trip Point	$V_{IN} - V_{OUT}$		25		mV
	RCB Hysteresis			70		mV
I_{SD_OUT}	V_{OUT} Shutdown Current	$V_{ON}=GND, V_{OUT}=5.5V,$ $V_{IN}=\text{Short to GND}$			10	μA
t_{DON}^{*1}	Turn-On Delay	$V_{IN}=3.8V, R_L=150\Omega, C_L=100\mu F$ Time from ON="H" $\rightarrow$ "L" to $V_{OUT}=V_{IN} \times 10\%$	0.5		2.5	ms
t_R^{*1}	V_{OUT} Rise Time	$V_{IN}=3.8V, R_L=150\Omega, C_L=100\mu F$ Time from $V_{OUT}=V_{IN} \times 10\%$ to $V_{IN} \times 90\%$	1.5		5.0	ms
t_{ON}^{*1}	Turn-On Time	$V_{IN}=3.8V, R_L=150\Omega, C_L=100\mu F$ Time from ON="H" $\rightarrow$ "L" to $V_{OUT}=V_{IN} \times 90\%$	2.0		7.5	ms

All test items listed under *ELECTRICAL CHARACTERISTICS* are done under the pulse load condition ($T_j \approx T_a = 25^{\circ}C$) except RCB Protection Trip Point, RCB Protection Release Trip Point, and RCB Hysteresis.

^{*1} Rise time from $V_{OUT}=0V$ is defined. Refer to the *TIMING CHART* for detailed information.

$V_{IN} = 1.8$ to $5.5V$, $I_{OUT} = 1mA$, $C_{IN} = 1\mu F$, $C_{OUT} = \text{None}$, unless otherwise noted.

The specifications surrounded by are guaranteed by design engineering at $-40^{\circ}C \leq T_a \leq 85^{\circ}C$.

R5527K001B

(Ta=25°C)

Symbol	Item	Conditions	Min.	Typ.	Max.	Unit
V_{IN}	Input Voltage		1.8		5.5	V
$I_{Q(OFF)}$	Off Supply Current	$V_{ON}=GND, V_{OUT}=OPEN$		0.5	1	μA
I_{SD}	Shutdown Current	$V_{ON}=GND, V_{OUT}=GND$	$T_a=25^{\circ}C$	0.5	1	μA
			$T_a=85^{\circ}C$	0.5	10	μA
I_Q	Quiescent Current	$V_{ON}=V_{IN}, I_{OUT}=0mA$		40	70	μA
R_{ON}	On Resistance	$V_{IN}=5V, I_{OUT}=1A$		48	65	m Ω
		$V_{IN}=4.5V, I_{OUT}=1A$		46		
		$V_{IN}=3.8V, I_{OUT}=1A$		45	60	
		$V_{IN}=3.3V, I_{OUT}=500mA$		45		
		$V_{IN}=2.5V, I_{OUT}=500mA$		51		
		$V_{IN}=1.8V, I_{OUT}=250mA$		68		
V_{IH}	ON Input Logic High Voltage	$V_{IN}=1.8V$ to $5.5V$	1.7			V
V_{IL}	ON Input Logic Low Voltage	$V_{IN}=1.8V$ to $5.5V$			1.2	V
I_{ON}	ON Input Leakage	$V_{ON}=GND$			1	μA
R_{ON_PD}	Pull-Down Resistance at ON Pin	$V_{IN}=V_{ON}=1.8V$ to $5.5V$		3		M Ω
V_{T_RCB}	RCB Protection Trip Point	$V_{OUT} - V_{IN}$		45		mV
V_{R_RCB}	RCB Protection Release Trip Point	$V_{IN} - V_{OUT}$		25		mV
	RCB Hysteresis			70		mV
I_{SD_OUT}	V_{OUT} Shutdown Current	$V_{ON}=GND, V_{OUT}=5.5V, V_{IN}=\text{Short to GND}$			10	μA
t_{DON}^{*1}	Turn-On Delay	$V_{IN}=3.8V, R_L=150\Omega, C_L=100\mu F$ Time from ON="L"→"H" to $V_{OUT}=V_{IN} \times 10\%$	0.5		2.5	ms
t_R^{*1}	V_{OUT} Rise Time	$V_{IN}=3.8V, R_L=150\Omega, C_L=100\mu F$ Time from $V_{OUT}=V_{IN} \times 10\%$ to $V_{IN} \times 90\%$	1.5		5.0	ms
t_{ON}^{*1}	Turn-On Time	$V_{IN}=3.8V, R_L=150\Omega, C_L=100\mu F$ Time from ON="L"→"H" to $V_{OUT}=V_{IN} \times 90\%$	2.0		7.5	ms

All test items listed under *ELECTRICAL CHARACTERISTICS* are done under the pulse load condition ($T_j \approx T_a = 25^{\circ}C$) except RCB Protection Trip Point, RCB Protection Release Trip Point, and RCB Hysteresis.

^{*1} Rise time from $V_{OUT}=0V$ is defined. Refer to the *TIMING CHART* for detailed information.

$V_{IN} = 1.8$ to $5.5V$, $I_{OUT} = 1mA$, $C_{IN} = 1\mu F$, $C_{OUT} = \text{None}$, unless otherwise noted.

The specifications surrounded by are guaranteed by design engineering at $-40^{\circ}C \leq T_a \leq 85^{\circ}C$.

R5527K001C

(Ta=25°C)

Symbol	Item	Conditions	Min.	Typ.	Max.	Unit
V_{IN}	Input Voltage		1.8		5.5	V
I_{SD}	Shutdown Current	$V_{ON}=V_{IN}$, $V_{OUT}=GND$		1	2	μA
				1	10	μA
I_Q	Quiescent Current	$V_{ON}=GND$, $I_{OUT}=0mA$		40	70	μA
R_{ON}	On Resistance	$V_{IN}=5V$, $I_{OUT}=1A$		48	65	m Ω
		$V_{IN}=4.5V$, $I_{OUT}=1A$		46		
		$V_{IN}=3.8V$, $I_{OUT}=1A$		45	60	
		$V_{IN}=3.3V$, $I_{OUT}=500mA$		45		
		$V_{IN}=2.5V$, $I_{OUT}=500mA$		51		
		$V_{IN}=1.8V$, $I_{OUT}=250mA$		68		
V_{IH}	ON Input Logic High Voltage	$V_{IN}=1.8V$ to $5.5V$	1.7			V
V_{IL}	ON Input Logic Low Voltage	$V_{IN}=1.8V$ to $5.5V$			1.2	V
I_{ON}	ON Input Leakage	$V_{ON}=V_{IN}$			1	μA
V_{T_RCB}	RCB Protection Trip Point	$V_{OUT} - V_{IN}$		45		mV
V_{R_RCB}	RCB Protection Release Trip Point	$V_{IN} - V_{OUT}$		25		mV
	RCB Hysteresis			70		mV
I_{SD_OUT}	V_{OUT} Shutdown Current	$V_{ON}=GND$, $V_{OUT}=5.5V$, $V_{IN}=\text{Short to GND}$			10	μA
t_{DON}^{*1}	Turn-On Delay	$V_{IN}=3.8V$, $R_L=150\Omega$, $C_L=100\mu F$ Time from ON="H"→"L" to $V_{OUT}=V_{IN} \times 10\%$	0.5		2.5	ms
t_R^{*1}	V_{OUT} Rise Time	$V_{IN}=3.8V$, $R_L=150\Omega$, $C_L=100\mu F$ Time from $V_{OUT}=V_{IN} \times 10\%$ to $V_{IN} \times 90\%$	1.5		5.0	ms
t_{ON}^{*1}	Turn-On Time	$V_{IN}=3.8V$, $R_L=150\Omega$, $C_L=100\mu F$ Time from ON="H"→"L" to $V_{OUT}=V_{IN} \times 90\%$	2.0		7.5	ms
R_{LOW}	Nch. On Resistance for Auto-Discharge	$V_{IN}=V_{ON}=5.0V$, $V_{OUT}=0.1V$		20		Ω

All test items listed under *ELECTRICAL CHARACTERISTICS* are done under the pulse load condition ($T_j \approx T_a = 25^{\circ}C$) except RCB Protection Trip Point, RCB Protection Release Trip Point, and RCB Hysteresis.

^{*1} Refer to the *TIMING CHART* for detailed information.

$V_{IN} = 1.8$ to $5.5V$, $I_{OUT} = 1mA$, $C_{IN} = 1\mu F$, $C_{OUT} = \text{None}$, unless otherwise noted.

The specifications surrounded by are guaranteed by design engineering at $-40^{\circ}C \leq T_a \leq 85^{\circ}C$.

R5527K001D

(Ta=25°C)

Symbol	Item	Conditions	Min.	Typ.	Max.	Unit
V_{IN}	Input Voltage		1.8		5.5	V
I_{SD}	Shutdown Current	$V_{ON}=GND$, $V_{OUT}=GND$	$T_a=25^{\circ}C$	0.5	1	μA
			$T_a=85^{\circ}C$	0.5	10	μA
I_Q	Quiescent Current	$V_{ON}=V_{IN}$, $I_{OUT}=0mA$		40	70	μA
R_{ON}	On Resistance	$V_{IN}=5V$, $I_{OUT}=1A$		48	65	m Ω
		$V_{IN}=4.5V$, $I_{OUT}=1A$		46		
		$V_{IN}=3.8V$, $I_{OUT}=1A$		45	60	
		$V_{IN}=3.3V$, $I_{OUT}=500mA$		45		
		$V_{IN}=2.5V$, $I_{OUT}=500mA$		51		
		$V_{IN}=1.8V$, $I_{OUT}=250mA$		68		
V_{IH}	ON Input Logic High Voltage	$V_{IN}=1.8V$ to $5.5V$	1.7			V
V_{IL}	ON Input Logic Low Voltage	$V_{IN}=1.8V$ to $5.5V$			1.2	V
I_{ON}	ON Input Leakage	$V_{ON}=GND$			1	μA
R_{ON_PD}	Pull-Down Resistance at ON Pin	$V_{IN}=V_{ON}=1.8V$ to $5.5V$		3		M Ω
V_{T_RCB}	RCB Protection Trip Point	$V_{OUT} - V_{IN}$		45		mV
V_{R_RCB}	RCB Protection Release Trip Point	$V_{IN} - V_{OUT}$		25		mV
	RCB Hysteresis			70		mV
I_{SD_OUT}	V_{OUT} Shutdown Current	$V_{ON}=GND$, $V_{OUT}=5.5V$, $V_{IN}=\text{Short to GND}$			10	μA
t_{DON}^{*1}	Turn-On Delay	$V_{IN}=3.8V$, $R_L=150\Omega$, $C_L=100\mu F$ Time from ON="L"→"H" to $V_{OUT}=V_{IN} \times 10\%$	0.5		2.5	ms
t_R^{*1}	V_{OUT} Rise Time	$V_{IN}=3.8V$, $R_L=150\Omega$, $C_L=100\mu F$ Time from $V_{OUT}=V_{IN} \times 10\%$ to $V_{IN} \times 90\%$	1.5		5.0	ms
t_{ON}^{*1}	Turn-On Time	$V_{IN}=3.8V$, $R_L=150\Omega$, $C_L=100\mu F$ Time from ON="L"→"H" to $V_{OUT}=V_{IN} \times 90\%$	2.0		7.5	ms
R_{LOW}	Nch. On Resistance for Auto-Discharge	$V_{IN}=5.0V$, $V_{ON}=GND$, $V_{OUT}=0.1V$		20		Ω

All test items listed under *ELECTRICAL CHARACTERISTICS* are done under the pulse load condition ($T_j \approx T_a = 25^{\circ}C$) except RCB Protection Trip Point, RCB Protection Release Trip Point, and RCB Hysteresis.

^{*1} Refer to the *TIMING CHART* for detailed information.

$V_{IN} = 1.8$ to $5.5V$, $I_{OUT} = 1mA$, $C_{IN} = 1\mu F$, $C_{OUT} = \text{None}$, unless otherwise noted.

The specifications surrounded by are guaranteed by design engineering at $-40^{\circ}C \leq T_a \leq 85^{\circ}C$.

R5527K002B

(Ta=25°C)

Symbol	Item	Conditions		Min.	Typ.	Max.	Unit
V _{IN}	Input Voltage			1.8		5.5	V
I _{Q(OFF)}	Off Supply Current	V _{ON} =GND,V _{OUT} =OPEN			0.5	1	μA
I _{SD}	Shutdown Current	V _{ON} =GND, V _{OUT} =GND	Ta=25°C		0.5	1	μA
			Ta=85°C		0.5	10	μA
I _Q	Quiescent Current	V _{ON} =V _{IN} , I _{OUT} =0mA			40	70	μA
R _{ON}	On Resistance	V _{IN} =5V, I _{OUT} =1A			48	65	mΩ
		V _{IN} =4.5V, I _{OUT} =1A			46		
		V _{IN} =3.8V, I _{OUT} =1A			45	60	
		V _{IN} =3.3V, I _{OUT} =500mA			45		
		V _{IN} =2.5V, I _{OUT} =500mA			51		
		V _{IN} =1.8V, I _{OUT} =250mA			68		
V _{IH}	ON Input Logic High Voltage	V _{IN} =1.8V to 5.5V		1.7			V
V _{IL}	ON Input Logic Low Voltage	V _{IN} =1.8V to 5.5V				1.2	V
I _{ON}	ON Input Leakage	V _{ON} =GND				1	μA
R _{ON_PD}	Pull-Down Resistance at ON Pin	V _{IN} =V _{ON} =1.8V to 5.5V			3		MΩ
I _{REV(OFF)}	Reverse Current at Off-State	V _{ON} =GND, V _{OUT} =5.5V, V _{IN} =1.8 V				10	μA
t _{DON} ^{*1}	Turn-On Delay	V _{IN} =3.8V, R _L =150Ω, C _L =100μF Time from ON="L"→"H" to V _{OUT} =V _{IN} X 10%		0.5		2.5	ms
t _R ^{*1}	V _{OUT} Rise Time	V _{IN} =3.8V, R _L =150Ω, C _L =100μF Time from V _{OUT} =V _{IN} X 10% to V _{IN} X 90%		1.5		5.0	ms
t _{ON} ^{*1}	Turn-On Time	V _{IN} =3.8V, R _L =150Ω, C _L =100μF Time from ON="L"→"H" to V _{OUT} =V _{IN} X 90%		2.0		7.5	ms

All test items listed under *ELECTRICAL CHARACTERISTICS* are done under the pulse load condition ($T_j \approx T_a = 25^{\circ}C$) except RCB Protection Trip Point, RCB Protection Release Trip Point, and RCB Hysteresis.

^{*1} Rise time from $V_{OUT}=0V$ is defined. Refer to the *TIMING CHART* for detailed information.

$V_{IN} = 1.8$ to $5.5V$, $I_{OUT} = 1mA$, $C_{IN} = 1\mu F$, $C_{OUT} = \text{None}$, unless otherwise noted.

The specifications surrounded by are guaranteed by design engineering at $-40^{\circ}C \leq T_a \leq 85^{\circ}C$.

R5527K002D

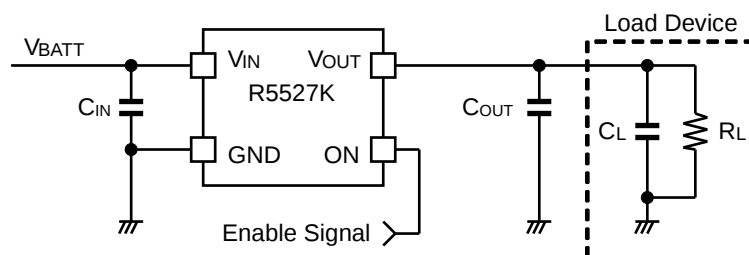
(Ta=25°C)

Symbol	Item	Conditions	Min.	Typ.	Max.	Unit
V_{IN}	Input Voltage		1.8		5.5	V
I_{SD}	Shutdown Current	$V_{ON}=GND$, $V_{OUT}=GND$	$T_a=25^{\circ}C$	0.5	1	μA
			$T_a=85^{\circ}C$	0.5	10	μA
I_Q	Quiescent Current	$V_{ON}=V_{IN}$, $I_{OUT}=0mA$		40	70	μA
R_{ON}	On Resistance	$V_{IN}=5V$, $I_{OUT}=1A$		48	65	m Ω
		$V_{IN}=4.5V$, $I_{OUT}=1A$		46		
		$V_{IN}=3.8V$, $I_{OUT}=1A$		45	60	
		$V_{IN}=3.3V$, $I_{OUT}=500mA$		45		
		$V_{IN}=2.5V$, $I_{OUT}=500mA$		51		
		$V_{IN}=1.8V$, $I_{OUT}=250mA$		68		
V_{IH}	ON Input Logic High Voltage	$V_{IN}=1.8V$ to $5.5V$	1.7			V
V_{IL}	ON Input Logic Low Voltage	$V_{IN}=1.8V$ to $5.5V$			1.2	V
I_{ON}	ON Input Leakage	$V_{ON}=GND$			1	μA
R_{ON_PD}	Pull-Down Resistance at ON Pin	$V_{IN}=V_{ON}=1.8V$ to $5.5V$		3		M Ω
t_{DON}^{*1}	Turn-On Delay	$V_{IN}=3.8V$, $R_L=150\Omega$, $C_L=100\mu F$ Time from ON="L"→"H" to $V_{OUT}=V_{IN} \times 10\%$	0.5		2.5	ms
t_R^{*1}	V_{OUT} Rise Time	$V_{IN}=3.8V$, $R_L=150\Omega$, $C_L=100\mu F$ Time from $V_{OUT}=V_{IN} \times 10\%$ to $V_{IN} \times 90\%$	1.5		5.0	ms
t_{ON}^{*1}	Turn-On Time	$V_{IN}=3.8V$, $R_L=150\Omega$, $C_L=100\mu F$ Time from ON="L"→"H" to $V_{OUT}=V_{IN} \times 90\%$	2.0		7.5	ms
R_{LOW}	Nch. On Resistance for Auto-Discharge	$V_{IN}=5.0V$, $V_{ON}=GND$, $V_{OUT}=0.1V$		20		Ω

All test items listed under *ELECTRICAL CHARACTERISTICS* are done under the pulse load condition ($T_J \approx T_a = 25^{\circ}C$) except RCB Protection Trip Point, RCB Protection Release Trip Point, and RCB Hysteresis.

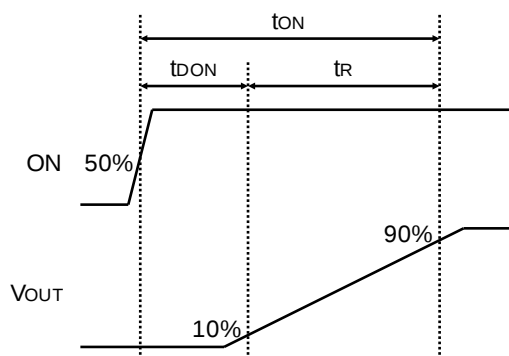
^{*1} Refer to the *TIMING CHART* for detailed information

TYPICAL APPLICATION

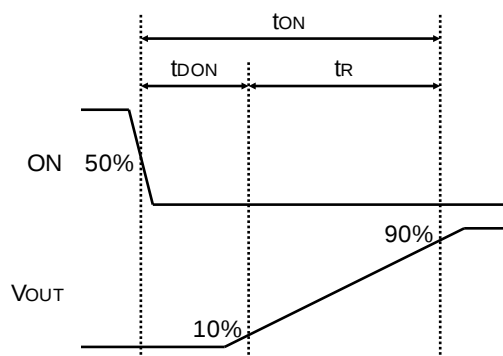


R5527K Typical Application

TIMING CHART



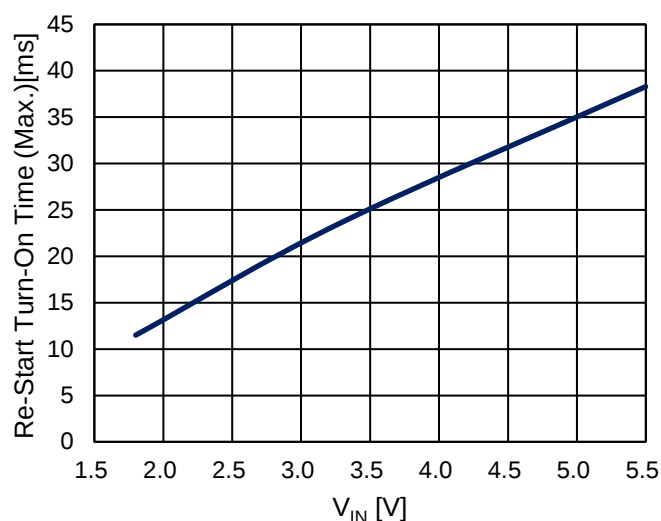
V_{OUT} Timing Chart (R5527K00xB/D)



V_{OUT} Timing Chart (R5527K001A/C)

TECHNICAL NOTES

- Basically, the R5527K does not require a bypass capacitor between V_{IN} pin and GND, however, considering the spike noise, use 0.1 μ F or more capacitor (1 μ F [Ceramic] recommended) as a bypass capacitor. If spikes may occur due to the inductance component of the VIN wiring on the board, connect a capacitor with a sufficient capacitance value between VIN pin and GND.
- There will be a delay time (Max. 1ms) before R5527K becomes disabled.
- When a voltage is remained in the output pin at the restart, the startup time (the time until R5527K is able to fully drive the output load from ON signal input) takes longer than the t_{ON} definition. Refer to the following graph for the maximum value of the startup time. When returning from the reverse current blocking (RCB) trip point, the following startup time is necessary based on the RCB protection release trip point.



PACKAGE INFORMATION

Power Dissipation (DFN(PL)1612-4D)

PD-DFN(PL)1612-4D-E-B

The power dissipation of the package is dependent on PCB material, layout, and environmental conditions. The following measurement conditions are based on JEDEC STD. 51.

Measurement Conditions

Item	Measurement Conditions
Environment	Mounting on Board (Wind Velocity = 0 m/s)
Board Material	Glass Cloth Epoxy Plastic (Four-Layer Board)
Board Dimensions	76.2 mm × 114.3 mm × 1.6 mm
Copper Ratio	Outer Layer (First Layer): Less than 95% of 50 mm Square Inner Layers (Second and Third Layers): Approx. 100% of 50 mm Square Outer Layer (Fourth Layer): Approx. 100% of 50 mm Square
Through-holes	φ 0.25 mm × 24 pcs

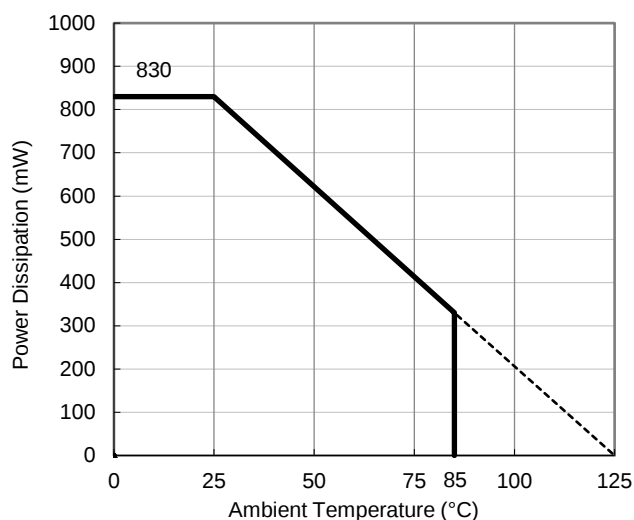
Measurement Result

(Ta = 25°C, Tjmax = 125°C)

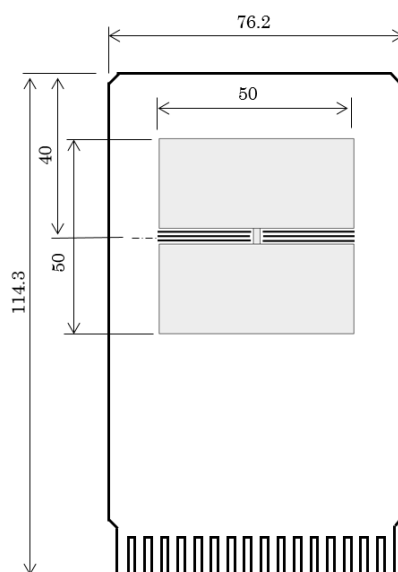
Item	Measurement Result
Power Dissipation	830 mW
Thermal Resistance (θ_{ja})	$\theta_{ja} = 120^{\circ}\text{C/W}$
Thermal Characterization Parameter (ψ_{jt})	$\psi_{jt} = 71^{\circ}\text{C/W}$

θ_{ja} : Junction-to-Ambient Thermal Resistance

ψ_{jt} : Junction-to-Top Thermal Characterization Parameter

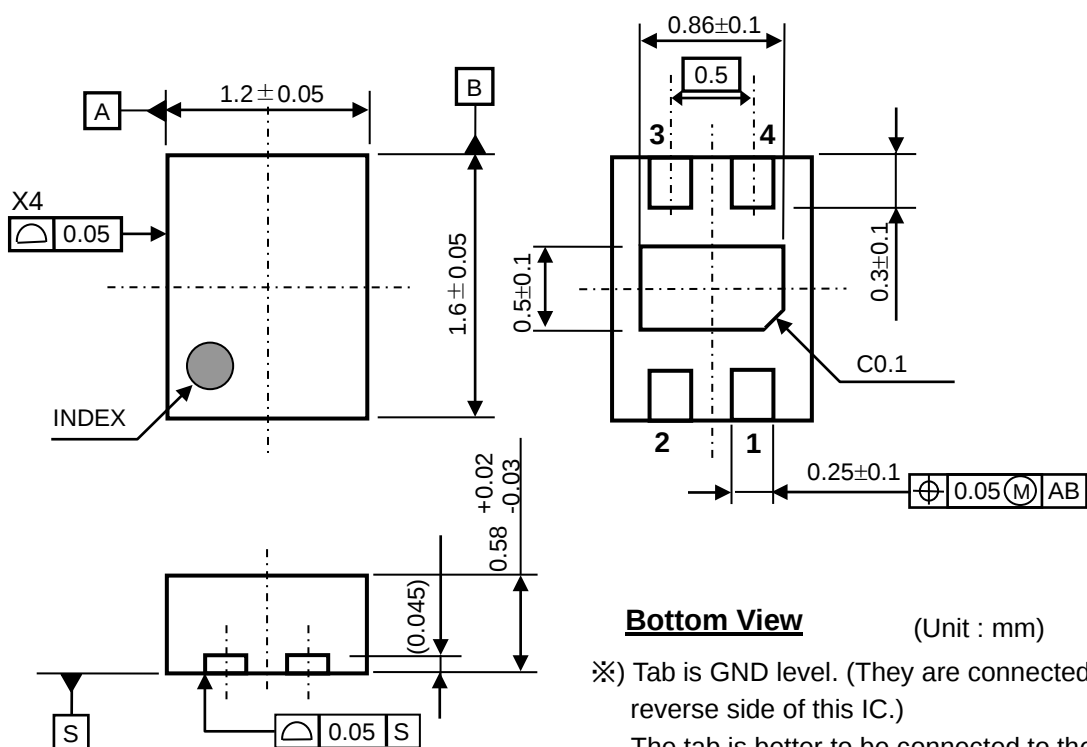


Power Dissipation vs. Ambient Temperature



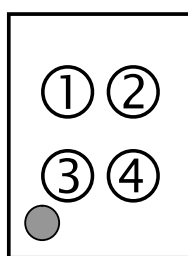
Measurement Board Pattern

Package Dimensions (DFN(PL)1612-4D)



Mark Specification (DFN(PL)1612-4D)

- ①②: Product Code ... Refer to "R5527K Mark Specification Table".
 ③④: Lot Number ... Alphanumeric Serial Number



Mark Specification

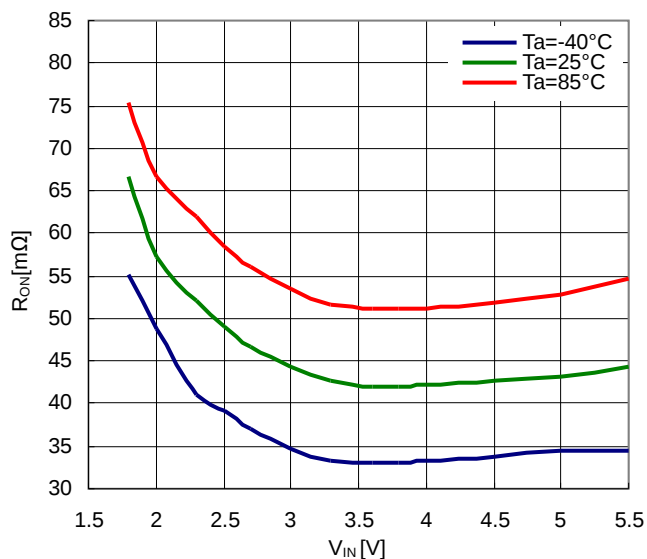
R5527K Mark Specification Table (DFN(PL)1612-4D)

Product Name	①②
R5527K001B	7A
R5527K001C	7B
R5527K001D	7C
R5527K001A	7D
R5527K002B	7E
R5527K002D	7F

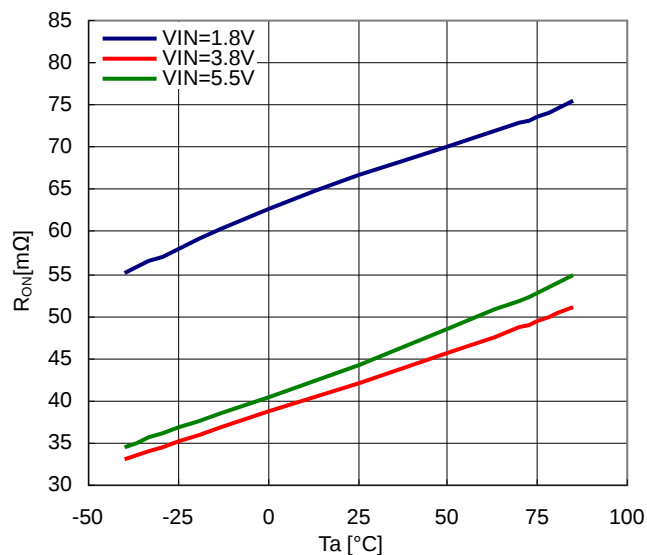
TYPICAL CHARACTERISTICS

Note: Typical Characteristics are intended to be used as reference data; they are not guaranteed.

1) On Resistance vs. Input Voltage

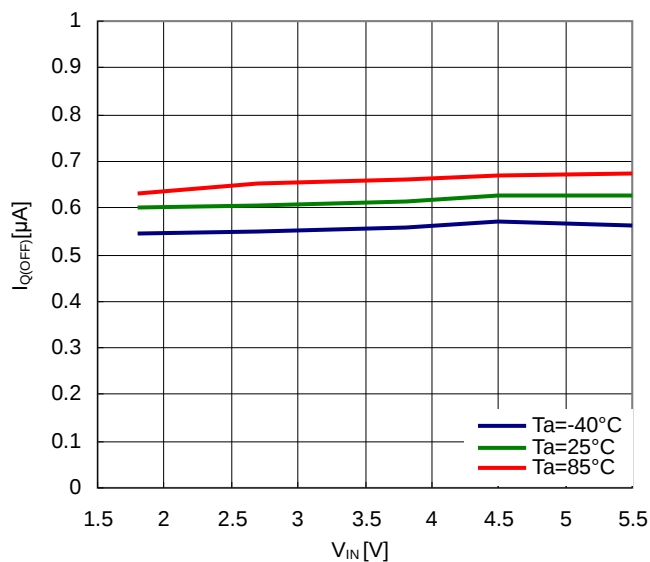


2) On Resistance vs. Temperature



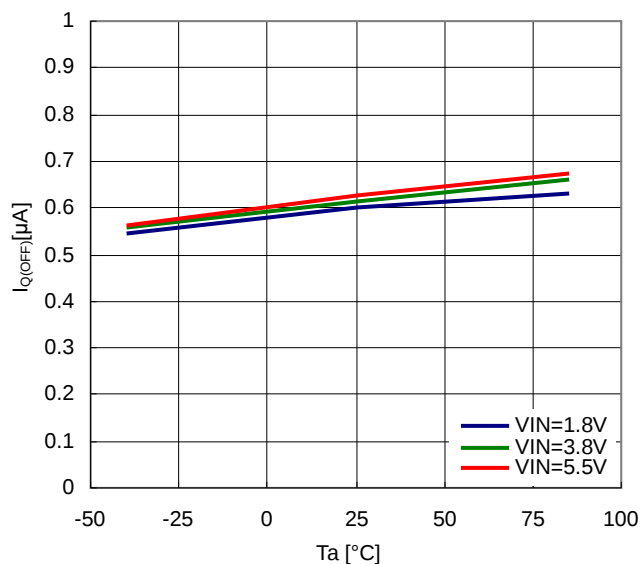
3) Off Supply Current vs. Input Voltage

R5527K00xB/R5527K00xD



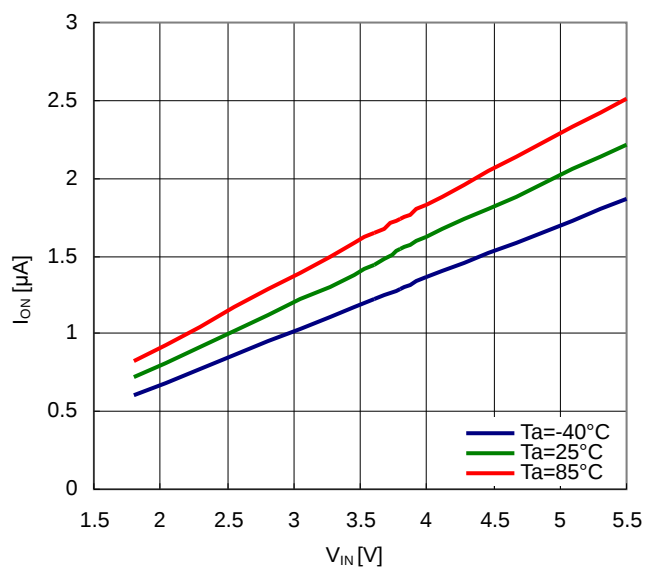
4) Off Supply Current vs. Temperature

R5527K00xB/R5527K00xD



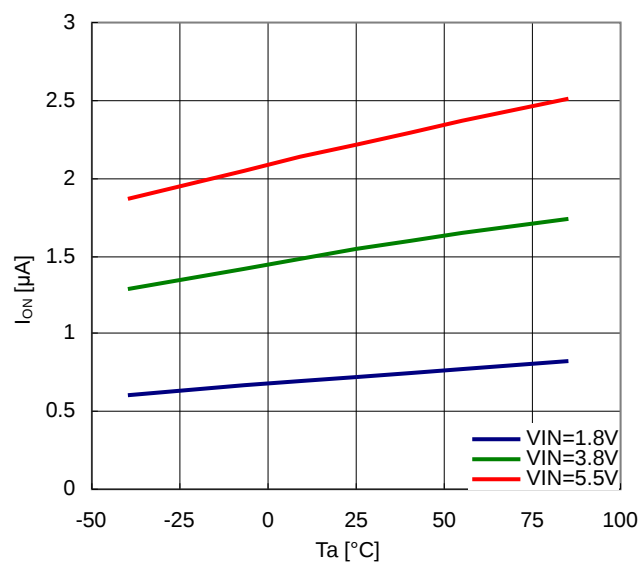
5) ON pin Pull-Down Current vs. Input Voltage

R5527K00xB/R5527K00xD

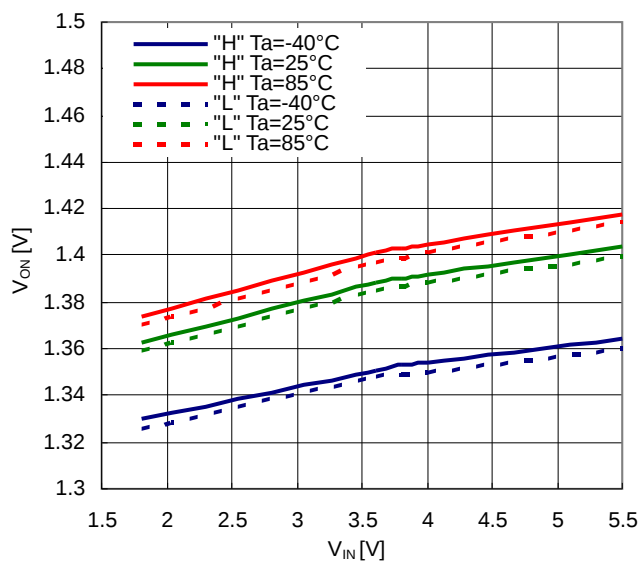


6) ON pin Pull-Down Current vs. Temperature

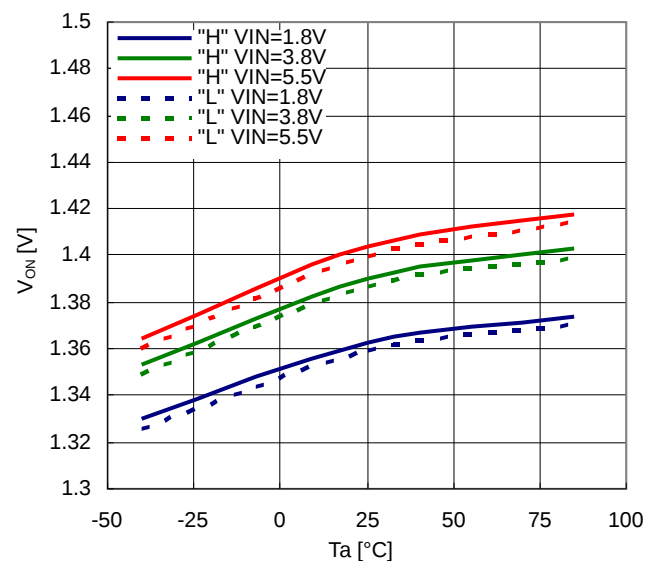
R5527K00xB/R5527K00xD



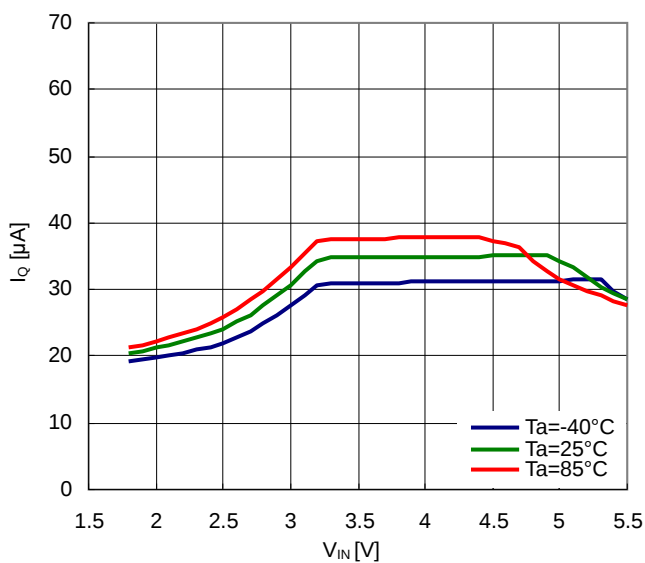
7) ON pin Logic Threshold vs. Input Voltage



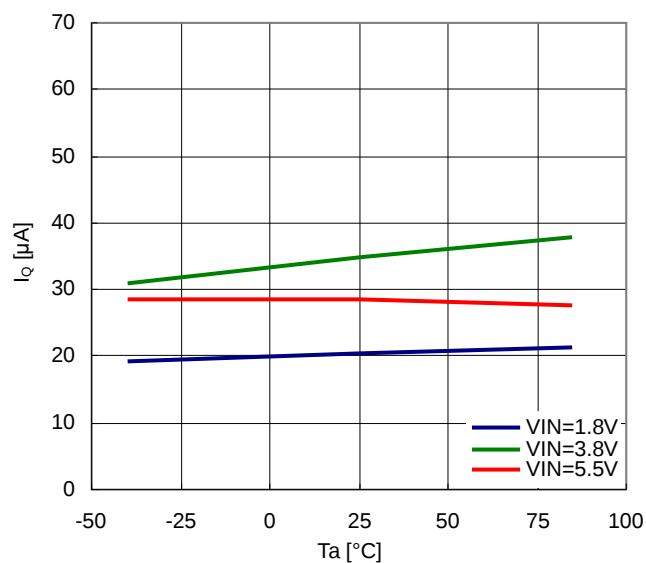
8) ON pin Logic Threshold vs. Input Voltage



9) Quiescent Current vs. Input Voltage

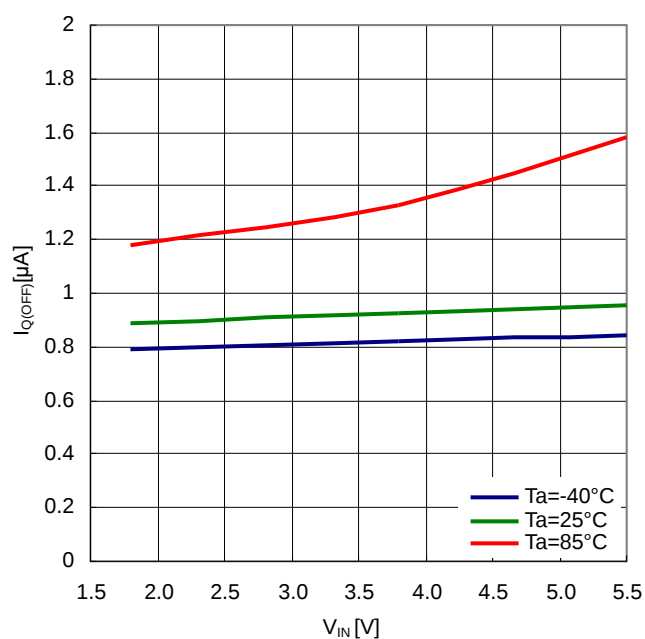


10) Quiescent Current vs. Temperature



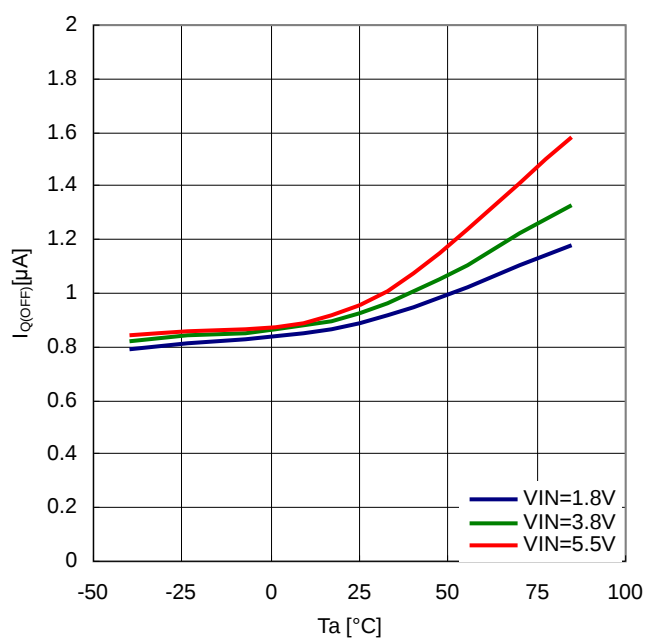
11) Off Supply Current vs. Input Voltage

R5527K001A/R5527K001C



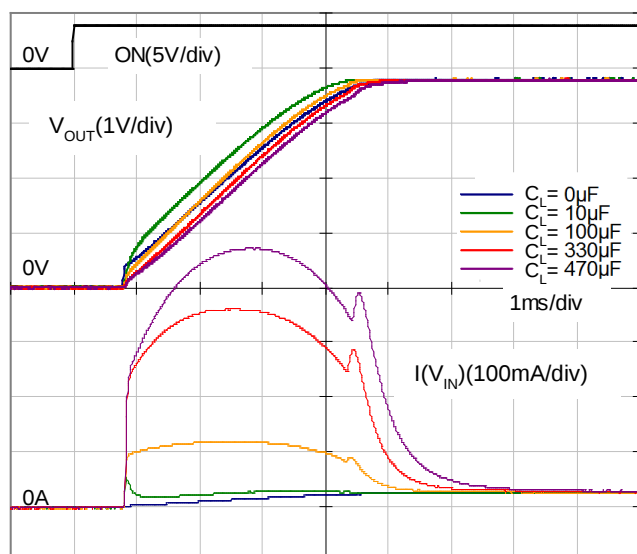
12) Off Supply Current vs. Temperature

R5527K001A/R5527K001C



13) Inrush Current

R5527K00xB

 $T_a=25^{\circ}\text{C}$ $R_L=150\Omega$ 

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 - Power Generator Control Equipment (nuclear, steam, hydraulic, etc.)
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 - Various Safety Devices
 - Traffic control system
 - Combustion equipment

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8. **Quality Warranty**
 - 8-1. **Quality Warranty Period**

In the case of a product purchased through an authorized distributor or directly from us, the warranty period for this product shall be one (1) year after delivery to your company. For defective products that occurred during this period, we will take the quality warranty measures described in section 8-2. However, if there is an agreement on the warranty period in the basic transaction agreement, quality assurance agreement, delivery specifications, etc., it shall be followed.
 - 8-2. **Quality Warranty Remedies**

When it has been proved defective due to manufacturing factors as a result of defect analysis by us, we will either deliver a substitute for the defective product or refund the purchase price of the defective product.

Note that such delivery or refund is sole and exclusive remedies to your company for the defective product.
 - 8-3. **Remedies after Quality Warranty Period**

With respect to any defect of this product found after the quality warranty period, the defect will be analyzed by us. On the basis of the defect analysis results, the scope and amounts of damage shall be determined by mutual agreement of both parties. Then we will deal with upper limit in Section 8-2. This provision is not intended to limit any legal rights of your company.
9. Anti-radiation design is not implemented in the products described in this document.
10. The X-ray exposure can influence functions and characteristics of the products. Confirm the product functions and characteristics in the evaluation stage.
11. WLCSP products should be used in light shielded environments. The light exposure can influence functions and characteristics of the products under operation or storage.
12. Warning for handling Gallium and Arsenic (GaAs) products (Applying to GaAs MMIC, Photo Reflector). These products use Gallium (Ga) and Arsenic (As) which are specified as poisonous chemicals by law. For the prevention of a hazard, do not burn, destroy, or process chemically to make them as gas or power. When the product is disposed of, please follow the related regulation and do not mix this with general industrial waste or household waste.
13. Please contact our sales representatives should you have any questions or comments concerning the products or the technical information.



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