

EARTH LEAKAGE CURRENT DETECTOR IC

GENERAL DESCRIPTION

G4603 is a high-speed, high accurate earth leakage current detector IC for wideband full wave F-type earth leakage current detection and circuits breaker application. It consists HV block, full wave F type detector, timers and SCR output driver. HV block greatly improves efficiency and reduced total BOM. F type detector amplifies the input signal and integrates by an external capacitor, and latches the leakage state co-operating with timers. At the same time, the chip also integrates the monopulse absorption function to meet the special requirements of F type product anti-interference. The G4603 also have over voltage (optional) and over temperature self protection to guarantee the system survival extreme condition.

Remark1: G4603-VT, with over voltage and over temperature self protection

FEATURES

- Full wave detection for F-type RCD
- Wideband detection and monopulse absorption (anti-interference)
- Low power dissipation
- High input sensitivity ($V_T = 6.1\text{mV Typ.}$)
- wide operation temperature range
- Low external component count
- High noise and surge-proof
- Compatible with AC110V/230V operation.
- Over voltage protection (optional)
- Over temperature self protection
- SOP14 package
- Upload and download without additional mechanical disconnect

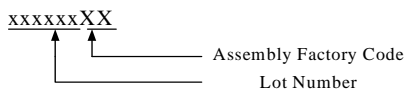
APPLICATIONS

Residual current device (earth leakage circuit breaker)

ORDERING INFORMATION

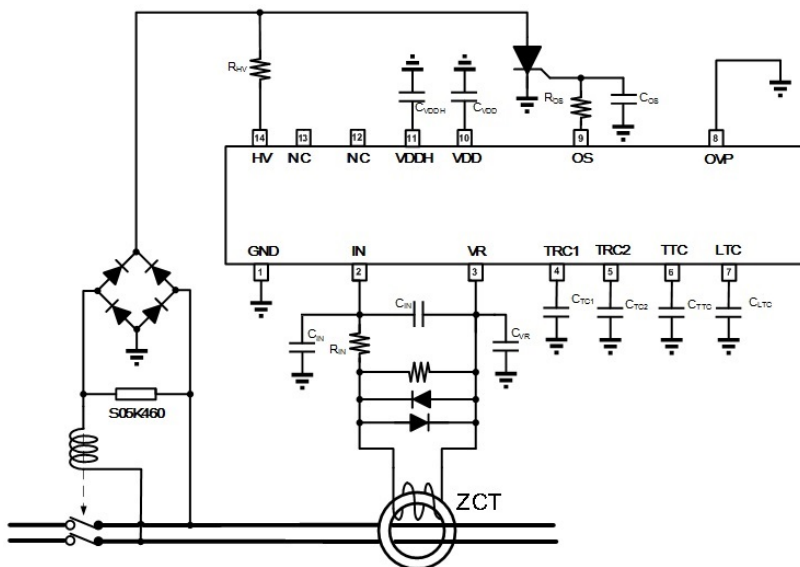
PACKAGE	PART NUMBER	TRANSPORT MEDIA	MARKING
SOP14, Pb free	G4603VT	Tube	G4603-VT xxxxxxXX

Note:



TYPICAL APPLICATIONS (Simplified NO OVP)

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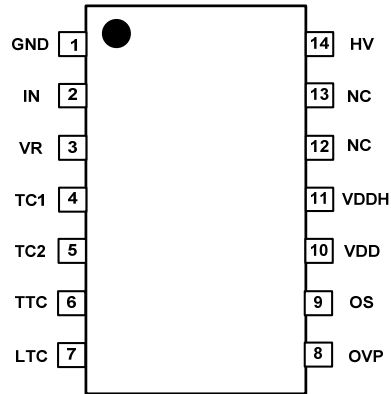
No OVP, with upload/download and time delay function

Remark 1 : Only download need connect LTC to ground

Remark 2: Without time delay need disconnect TTC

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PIN ASSIGNMENT (SOP14)



PIN DESCRIPTIONS

Num.	Name	I/O	Descriptions
1	GND	Power	Ground
2	IN	I	Input voltage from ZCT
3	VR	I/O	Voltage reference
4	TRC1	I/O	Capacitor of negative side detection
5	TRC2	I/O	Capacitor of positive side detection
6	TTC	I/O	Capacitor of trip time control
7	LTC	I/O	Capacitor of Latch time control
8	OVP	I	Over voltage detection input
9	OS	O	Output to SCR
10	VDD	Power	Power supply
11	VDDH	Power	Power supply for HV device
12	NC		No Connection
13	NC		No Connection
14	HV	Power	Line Voltage input

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ABSOLUTE MAXIMUM RATINGS

SYM	PARAMETER	VALUE	UNIT
V_{HV}	HV Supply Voltage	700	V
V_{VDDH}	VDDH Voltage	20	V
V_{VDD}	VDD Voltage	7	V
$V_{IN}, V_{VR}, V_{TRC1/2}, V_{TTC}, V_{LTC}, V_{OS}, V_{OVP}$	Rest PIN Input Voltage	-0.3~7	V
T_{STG}	Storage Temperature Range	-55~160	°C

PACKAGE DISSIPATION RATING

SYM	PARAMETER	VALUE	UNIT
$R_{\theta JA}$	SOP14	100	°C/W

OPERATING RANGE

SYM	PARAMETER	VALUE	UNIT
V_{HV}	V_{DD} Supply Voltage	20~500	V
T_A	Recommended Operating Ambient Temperature	-25~100	°C
	Extreme Operating Ambient Temperature	-40~125	°C

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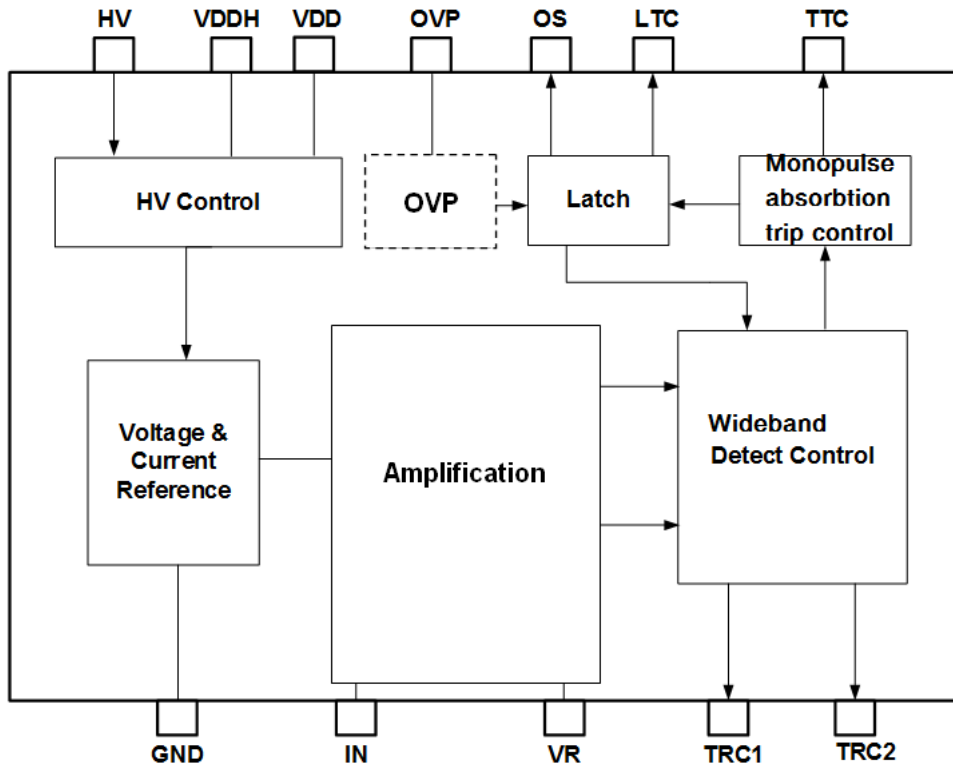
ELECTRICAL CHARACTERISTICS

(T_{OPT}=25°C, HV=100V, unless specified otherwise)

Parameter	Symbol	Condition	MIN	TYP	MAX	Units
Power Supply Section						
Supply Current	I _s	HV=60V, VI=VR		200		uA
VDDH Voltage	VDDH	HV=60V		12		V
VDD Voltage	VDD	HV=60V		5.1		V
BV of HV pin	BV _{HV}		700			V
HV charge current	I _{HV}	HV=60V, VDD=0V	1			mA
Detection Section						
Reference voltage	V _{REF}			2.4		V
Trip voltage	V _T	RMS value	4	6	8	mV
TRC source current	I _{TRC1,2_source}			22		uA
TRC sink current	I _{TRC1,2_sink}			28		uA
TRC threshold	V _{TH_TRC1,2}			1.2		V
Output Section						
TTC source current	I _{TTC_source}			68		uA
I _{TTC_source_OVP}	I _{TTC_ovp}			0.75		uA
TTC threshold	V _{TH_TTC}			2.4		V
LTC source current	I _{LTC_source}			22		uA
LTC threshold	V _{TH_LTC}			2.4		V
Output Current	I _o			200		uA
Output Low level Current	I _{o_L}	V _{OSL} =0.5V	500			uA
Protection Section						
Over voltage threshold	V _{TH_OVP}		2.16	2.4	2.64	V
Thermal shutdown	T _{DOWN}			150		°C
Hysteresis	T _{Hys}			15		°C

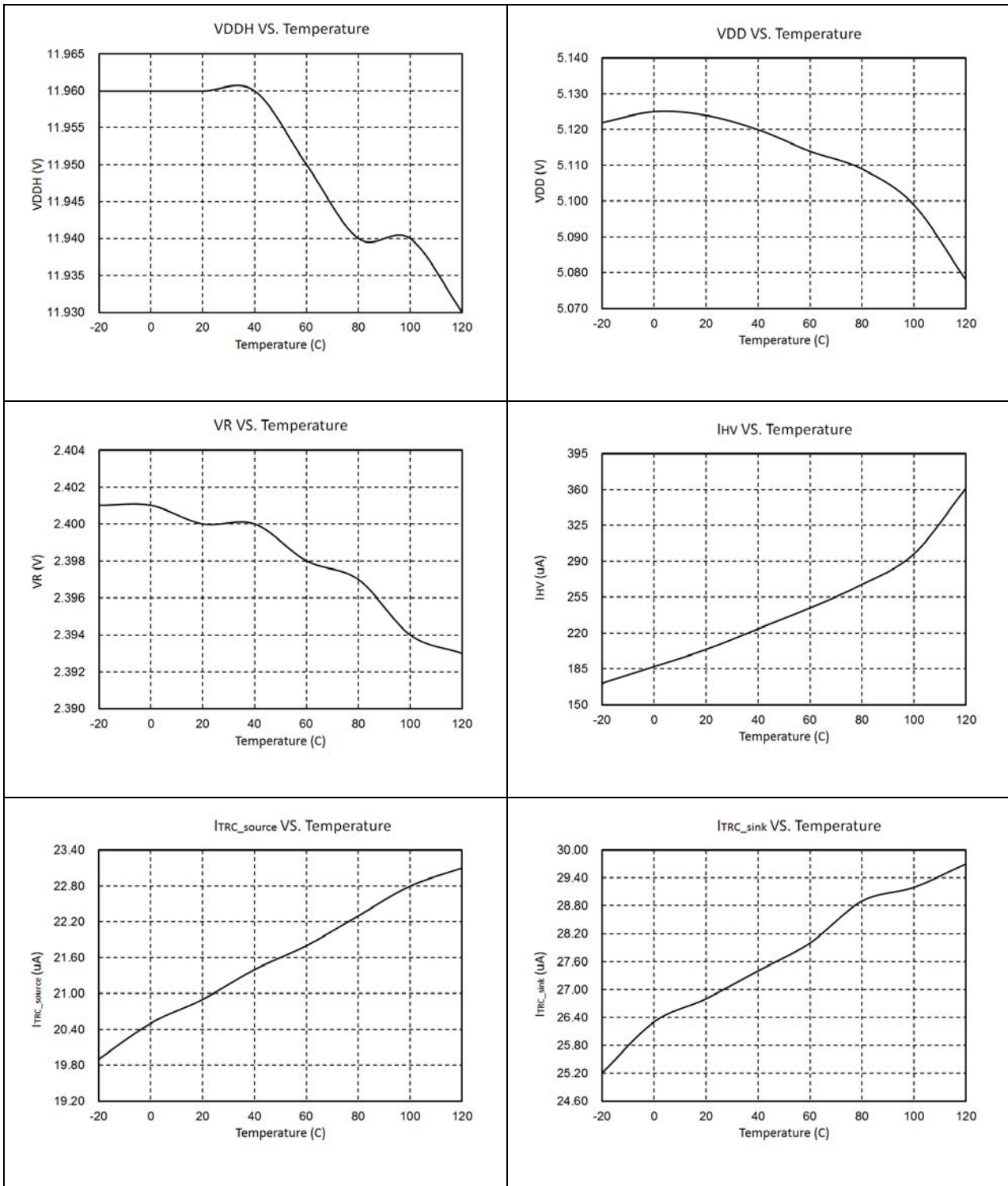
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SIMPLIFIED BLOCK DIAGRAM



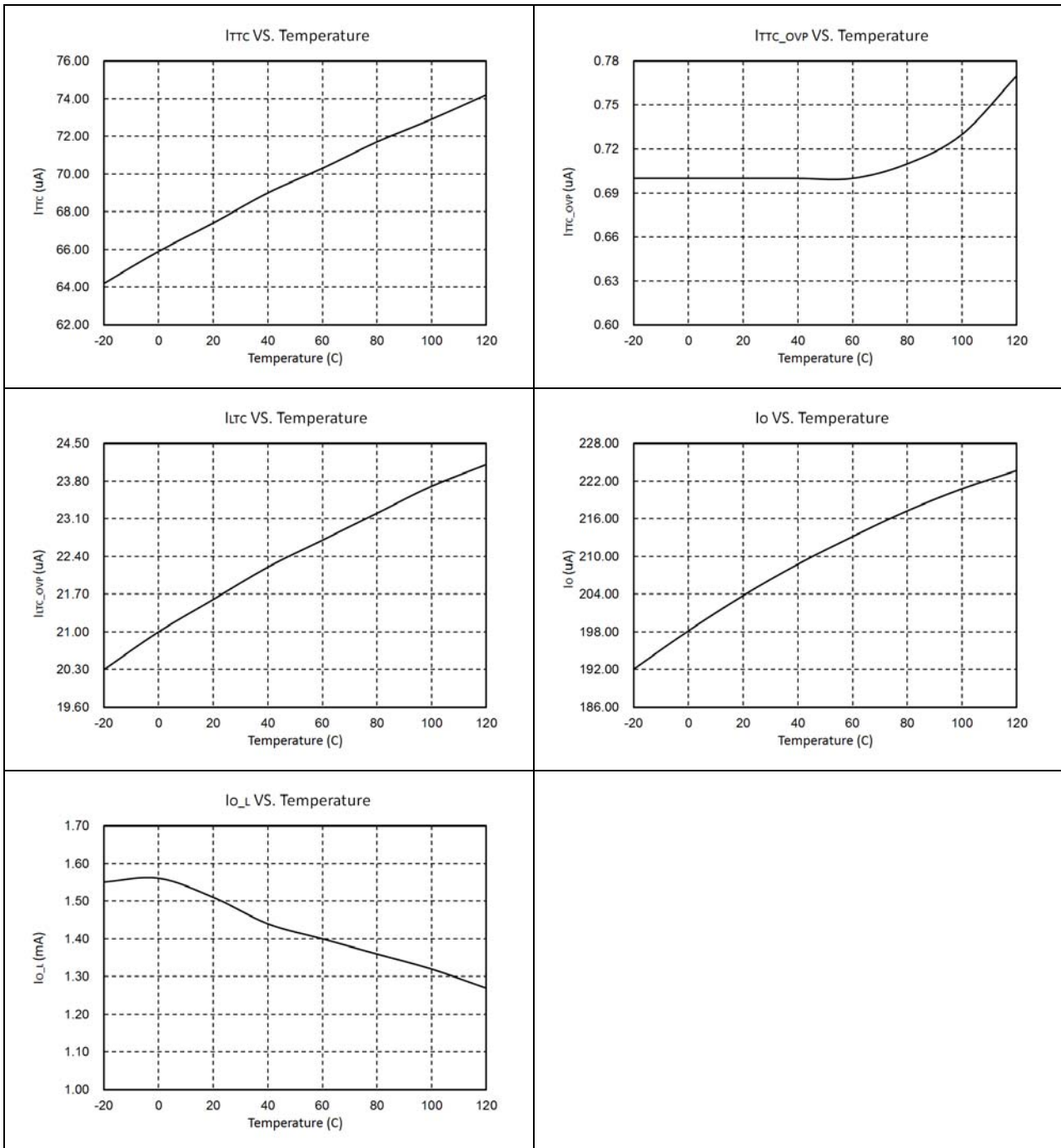
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TYPICAL PERFORMANCE CHARACTERISTICS



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TYPICAL PERFORMANCE CHARACTERISTICS (continued)



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PACKAGE INFORMATION

