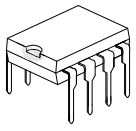
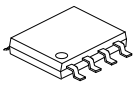
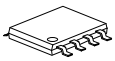
M4565 **LINEAR INTEGRATED CIRCUIT**

DUAL OPERATIONAL AMPLIFIER


DIP-8


SOP-8


TSSOP-8

■ DESCRIPTION

The UTC **M4565** integrated circuit is a high-gain, wide-bandwidth, dual low noise operational amplifier capable of driving 20V peak-to-peak into 400Ω load.

■ FEATURES

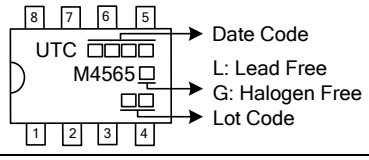
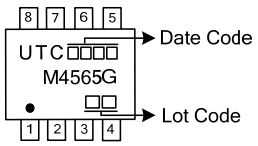
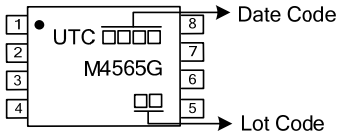
* Operating Voltage: ±4V~±18V
* Wide Gain Bandwidth Product: 4MHz (typ.)
* Slew Rate: 4V/μs (typ.)

■ ORDERING INFORMATION

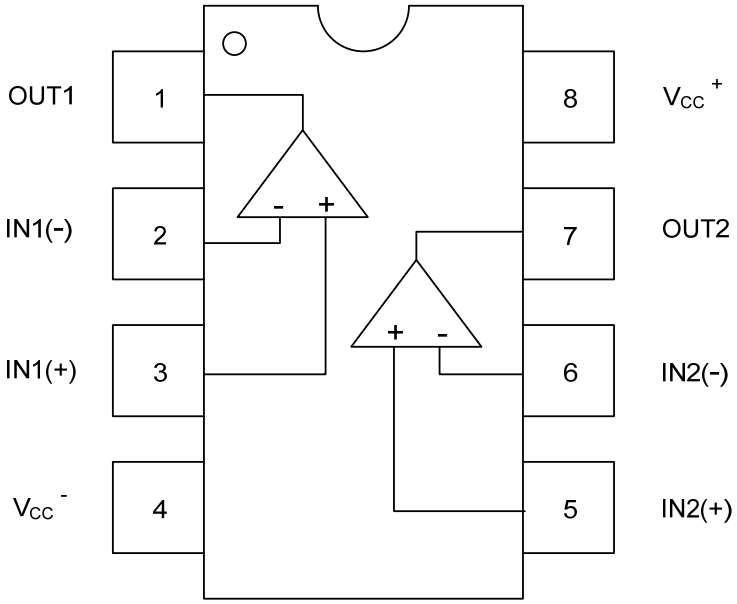
Ordering Number		Package	Packing
Lead Free	Halogen Free		
M4565L-D08-T	M4565G-D08-T	DIP-8	Tube
-	M4565G-S08-R	SOP-8	Tape Reel
-	M4565G-P08-R	TSSOP-8	Tape Reel

M4565L-D08-T (1)Packing Type (2)Package Type (3)Green Package	(1) T: Tube, R: Tape Reel (2) D08: DIP-8, S08: SOP-8, P08: TSSOP-8 (3) L: Lead Free, G: Halogen Free and Lead Free

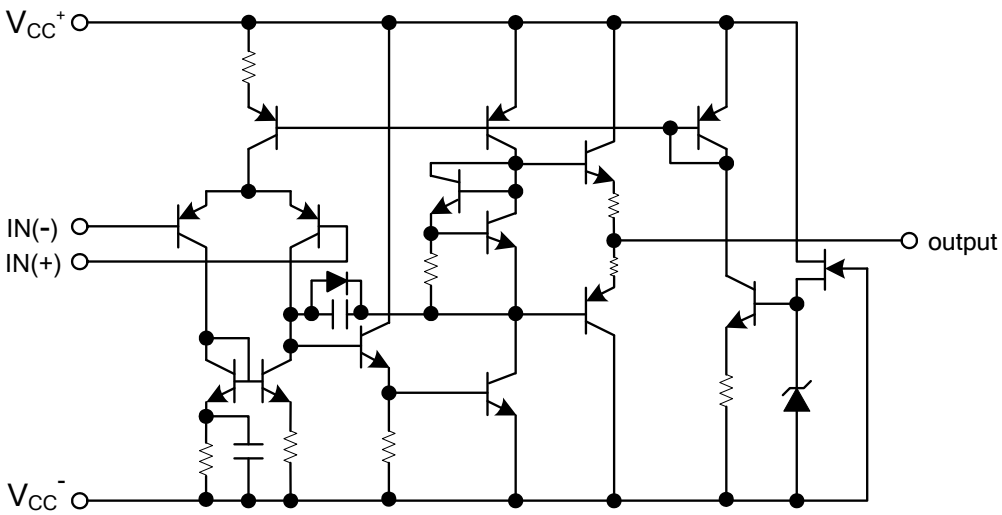
■ MARKING

DIP-8	SOP-8	TSSOP-8
		

■ PIN CONFIGURATION



■ EQUIVALENT CIRCUIT



■ ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage		V^+/V^-	±18	V
Differential Input Voltage		V_{ID}	±30	V
Input Voltage		V_{IC}	±15 (Note)	V
Power Dissipation	DIP-8	P_D	500	mW
	SOP-8		300	mW
	TSSOP-8		250	mW
Operating Temperature Range		T_{OPR}	-20 ~ +75	°C
Storage Temperature Range		T_{STG}	-40 ~ +125	°C

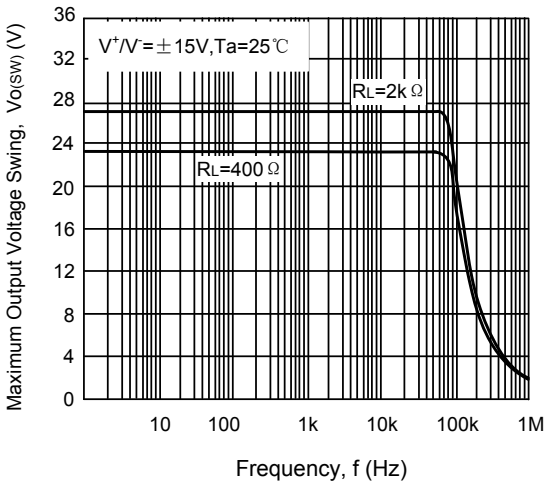
Note: For supply voltage less than ±15V,the absolute maximum input voltage is equal to the supply voltage.

■ ELECTRICAL CHARACTERISTICS (T_A=25°C, V+/V-=±15V)

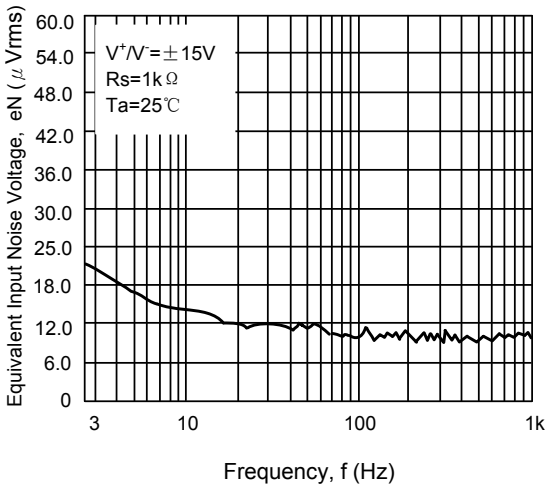
PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Input Offset Voltage	$V_{I(OFF)}$	R_S≤10kΩ		0.5	3.0	mV
Input Offset Current	$I_{I(OFF)}$			2	50	nA
Input Bias Current	$I_{I(BIAS)}$			50	200	nA
Input Resistance	R_{IN}		0.3	5		MΩ
Large Signal Voltage Gain	Gv	R_L≥2kΩ, V_{OUT}=±10V	86	100		dB
Maximum Output Voltage Swing 1	$V_{O(SW1)}$	R_L≥2kΩ	±12	±14		V
Maximum Output Voltage Swing 2	$V_{O(SW2)}$	I_{OUT}=25mA	±10	±11.5		V
Input Common Mode Voltage Range	$V_{I(CM)}$		±12	±14		V
Common Mode Rejection Ratio	CMRR	R_S≤10kΩ	70	90		dB
Supply Voltage Rejection Ratio	SVR	R_S≤10kΩ	76.5	90		dB
Operating Current	I_{CC}			4.5	7	mA
Slew Rate	SR			4		V/μs
Gain Bandwidth Product	GB_W			10		MHz
Equivalent Input Noise Voltage	eN	RIAA, R_S=2.2kΩ, 30kHz LPF		1.2		μVrms

■ TYPICAL CHARACTERISTICS

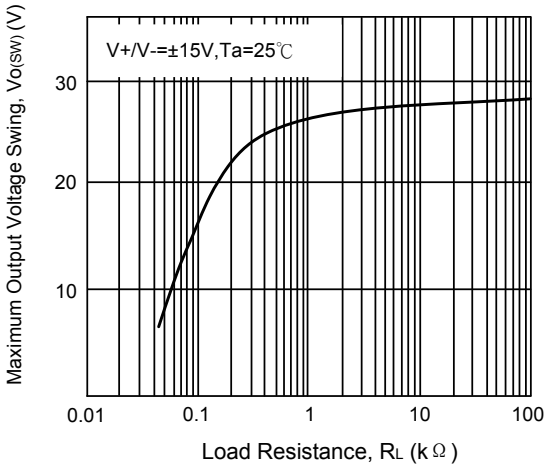
Maximum Output Voltage Swing vs. Frequency



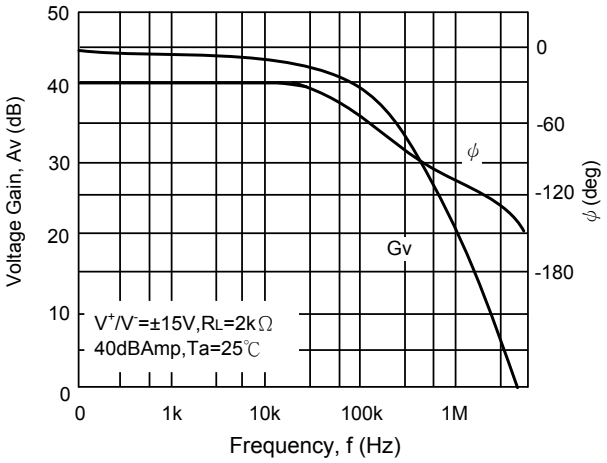
Equivalent Input Noise Voltage vs. Frequency



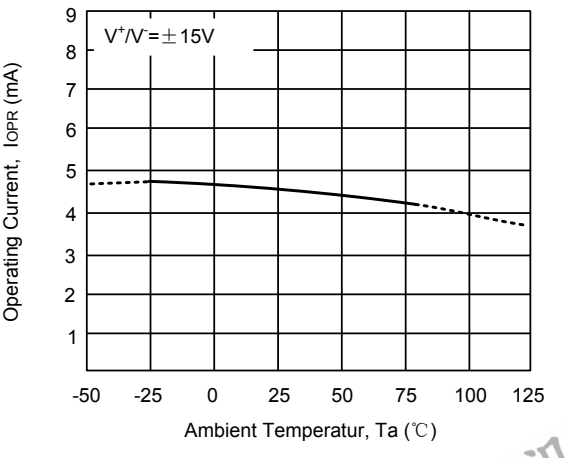
Maximum Output Voltage Swing vs. Load Resistance



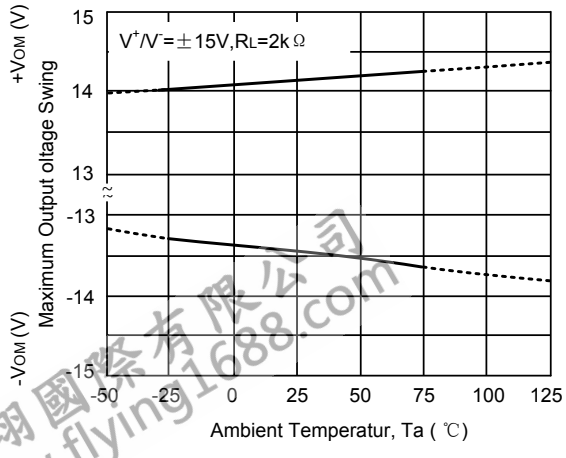
Voltage Gain Phase vs. Frequency



Operating Current vs.Temperature

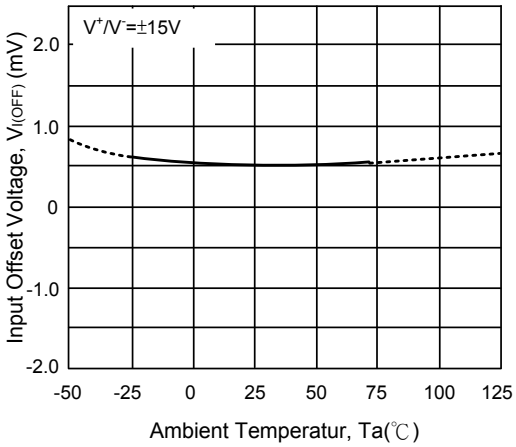


Maximum Output Voltage Swing vs.Temperature

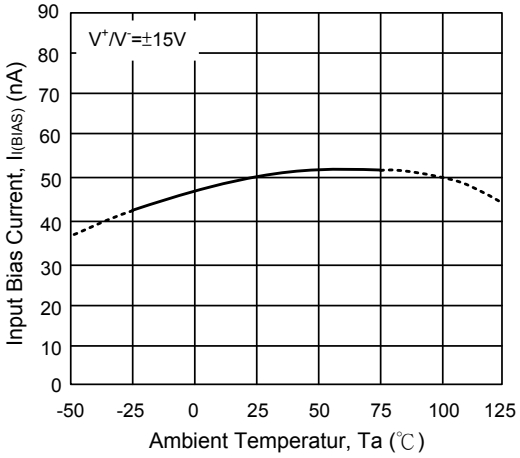


■ TYPICAL CHARACTERISTICS(Cont.)

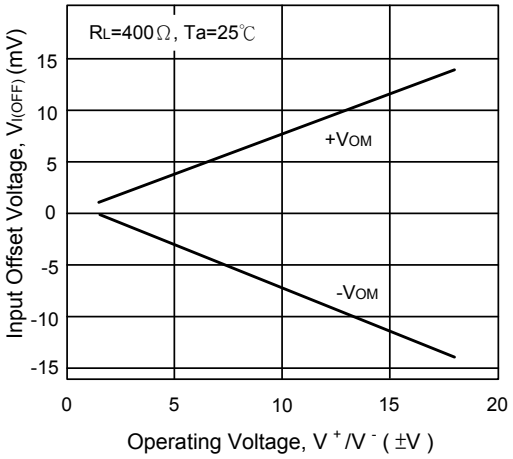
Input Offset Voltage vs.Temperature



Input Bias Current vs. Temperature



Maximum Output Voltage Swing vs. Operating Voltage



Operating Current vs. Operating Voltage