



H34063AS

DC-TO-DC CONVERTER INTEGRATE CIRCUIT DEVICES

Description

The H34063AS Series is a monolithic control circuit containing the primary functions required for DC-to-DC converters. These devices consist of an internal temperature compensated reference, comparator, controlled duty cycle oscillator with an active current limit circuit, driver and high current output switch. This series was specifically by Hi-Sincerity Microelectronics Corp.

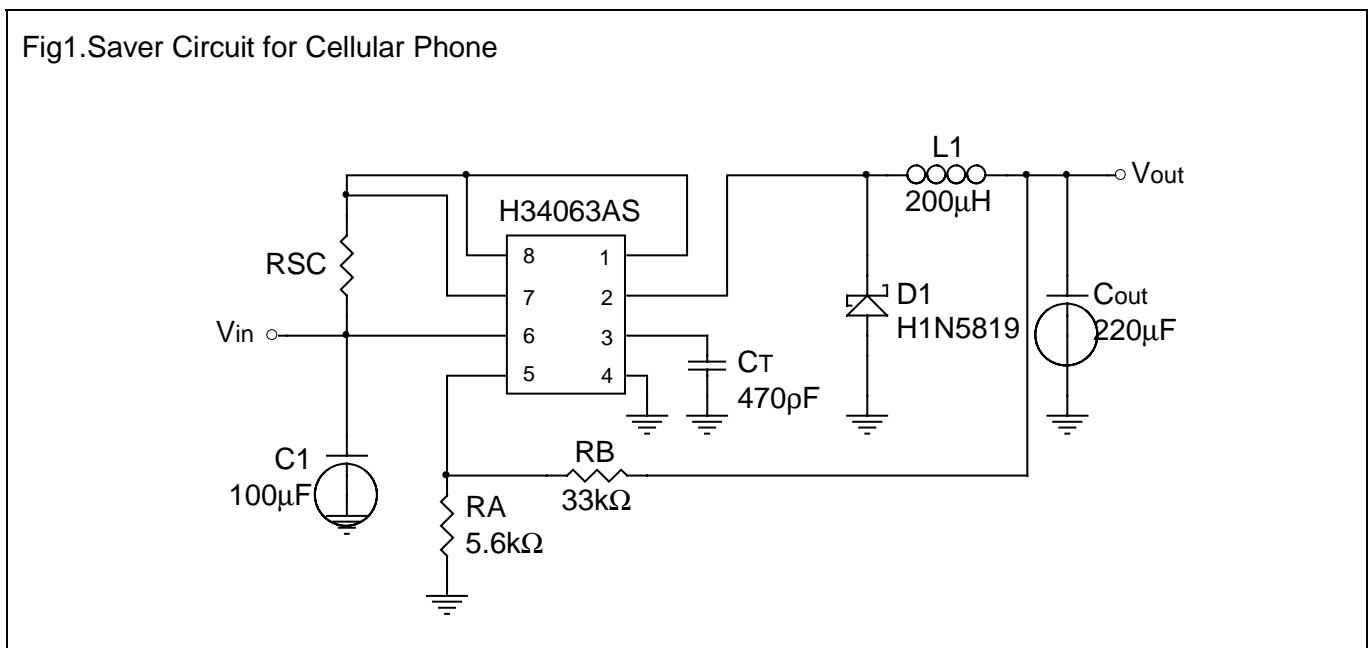
Features

- 3V to 40V Input Voltage Operation
- Internal 1.6A Peak Current Switch
- Internal $\pm 1.8\%$ Reference
- Low Quiescent Current at 1.6mA
- Frequency Operation from 100Hz~100KHz
- Current Limiting

Applications

- Saver for Cellular Phone
- DC-DC Converter Module

Typical Application Circuit





Pin Connections

	Pin1:Switch Collector	Pin5:Comparator Inverting Input
	Pin2:Switch Emitter	Pin6:Vcc
	Pin3:Timing Capacitor	Pin7:lpk Sense
	Pin4:Gnd	Pin8:Driver Collector

Absolute Maxium Rating

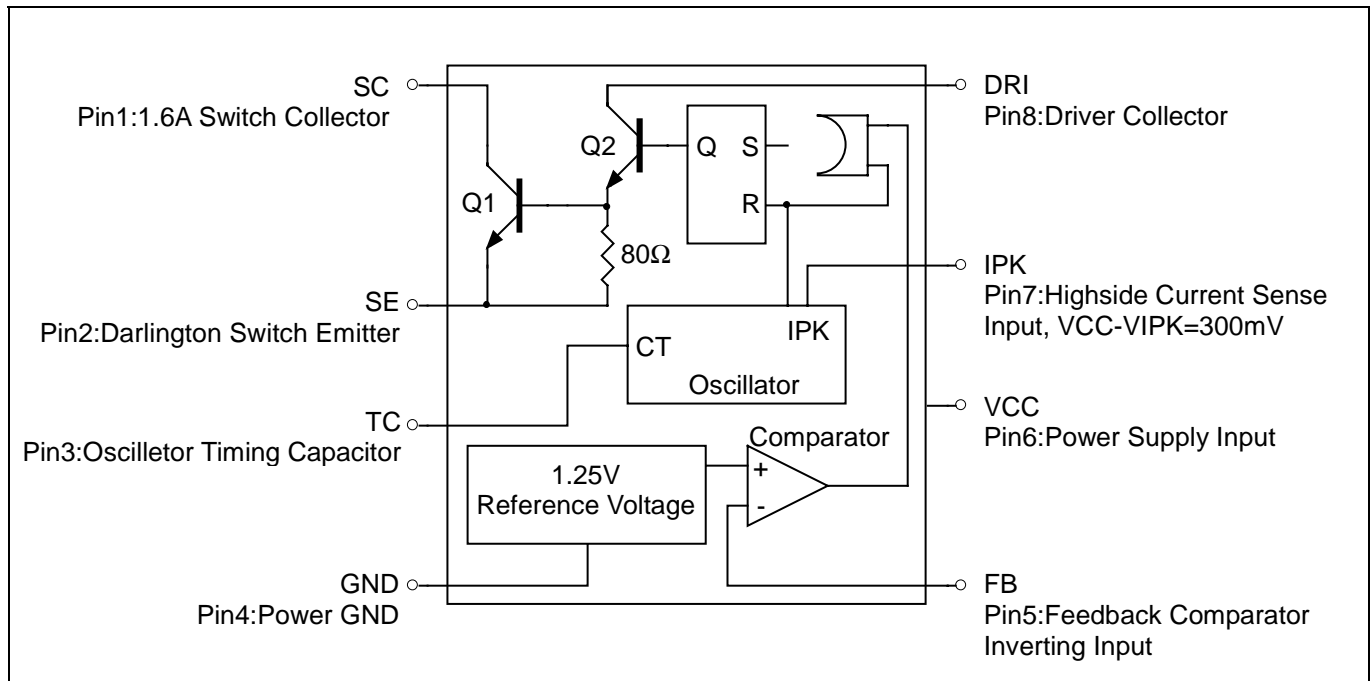
Supply Voltage	40 V
Comparator Input Voltage Range	-0.3 V ~ 40 V
Switch Collector Voltage	40 V
Switch Emitter Voltage	40 V
Switch Collector to Emitter Voltage	40 V
Driver Collector Voltage	40 V
Switch Current	1.6A
Power Dissipation DIP Package Ta=25°C	625 mW
Thermal Resistance Junction to Air	160 °C / W
Operating Junction Temperature	125 °C
Operating Ambient Temperature Range	0 ~ 70 °C
Storage Temperature Range	-40 °C ~ 125 °C

Electrical Characteristics (Vcc=5V,Ta=25°C, unless otherwise specified)

Parameter	Test Condition	Symbol	Min.	Typ.	Max.	Unit
<i>Oscillator</i>						
Charging Current	5.0V≤VCC≤40V	I _{chg}	24	35	42	uA
Discharge Current	5.0V≤VCC≤40V	I _{dischg}	140	220	260	uA
Voltage Amplitude	Pin3	V _{Osc}	-	0.6	-	V
Discharge to Charge Current Ratio	V _{IPK(Sence)} =VCC	I _{Dischg} /I _{chg}	5.2	6.5	7.5	
Current Limit Sense Voltage	I _{Chg} =I _{dischg}	V _{IPK(Sence)}	250	300	350	mV
<i>Output Switch</i>						
Saturation Voltage, Darlington Connection	I _{SW} =1.0A, V _{C(Driver)} =V _{C(Switch)}	V _{CE(Sat)}	-	1.0	1.3	V
Saturation Voltage	I _{SW} =1.0A, I _{C(Driver)} =50mA (Forced β ≈ 20)	V _{CE(Sat)}	-	0.4	0.7	V
DC Current Gain	I _{SW} =1.0A, V _{CE} =5.0V	h _{FE}	50	75	-	V
Collector Off-State Current	V _{CE} =40V	I _{CC(Off)}	-	0.01	100	uA
<i>Comparator</i>						
Threshold Voltage	0°C≤Ta≤70°C	V _{FB}	1.227	1.250	1.273	V
Threshold Voltage			1.210	-	1.29	
Threshold Voltage Line Regulation	3.0V≤VCC≤40V	Regline	-	1.5	6	mV
Input Bias Current	V _{IN} =0V	I _{IB}	-	-20	-400	nA
Supply Current	V _{IPK(Sence)} =VCC V _{Pin5} >V _{FB} , 5.0V≤VCC≤40V C _T =0.0001uF,Pin2=Gnd Remaining pins open	I _{CC}	-	1.6	3	mA



Block Diagram



Application Information

Design Formula Table

Calculation	Step-Down	Step-Up	Voltage-Inverting
ton / toff	$\frac{V_{out}+V_F}{V_{in(min)}-V_{sat}-V_{out}}$	$\frac{V_{out}+V_F-V_{in(min)}}{V_{in(min)}-V_{sat}}$	$\frac{ V_{out} + V_F}{V_{in}-V_{sat}}$
(ton + toff) max	$1/F_{min}$	$1/F_{min}$	$1/F_{min}$
CT	$4*10^{-5}ton$	$4*10^{-5}ton$	$4*10^{-5}ton$
IC(switch)	$2*I_{out(max)}$	$2*I_{out(max)}(ton+toff/toff)$	$2*I_{out(max)}(ton+toff/toff)$
RS	$0.3 / IC(switch)$	$0.3 / IC(switch)$	$0.3 / IC(switch)$
L(min)	$\frac{(V_{in(min)}-V_{sat}-V_{out})}{IC(switch)} * ton(max)$	$\frac{(V_{in(min)}-V_{sat})}{IC(switch)} * ton(max)$	$\frac{(V_{in(min)}-V_{sat})}{IC(switch)} * ton(max)$
CO	$\frac{IC(switch)*(ton+toff)}{8V_{Ripple(P-P)}}$	$\frac{I_{out}*ton}{V_{Ripple(P-P)}}$	$\frac{I_{out}*ton}{V_{Ripple(P-P)}}$

V_{sat} : Saturation voltage of the output switch.

V_F : Forward voltage drop of the ringback rectifier.

The following power supply characteristics must be chosen :

V_{in} : Nominal input voltage.

V_{out} : Desired output voltage. $|V_{out}|=1.25*(1+R_B/R_A)$

I_{out}- Desired output current

F_{min} : Minimum desired output switching frequency at the selected values for V_{in} and I_{out}.

V_{Ripple(P-P)} : Desired peak to peak output ripple voltage in practice, the calculated value will need to be increased due to the capacitor equivalent series resistance and board layout. The ripple voltage should be kept to a low value since it will directly effect the line and load regulation.



Application Information (Continuos)

Fig.2 Step-Up Converter

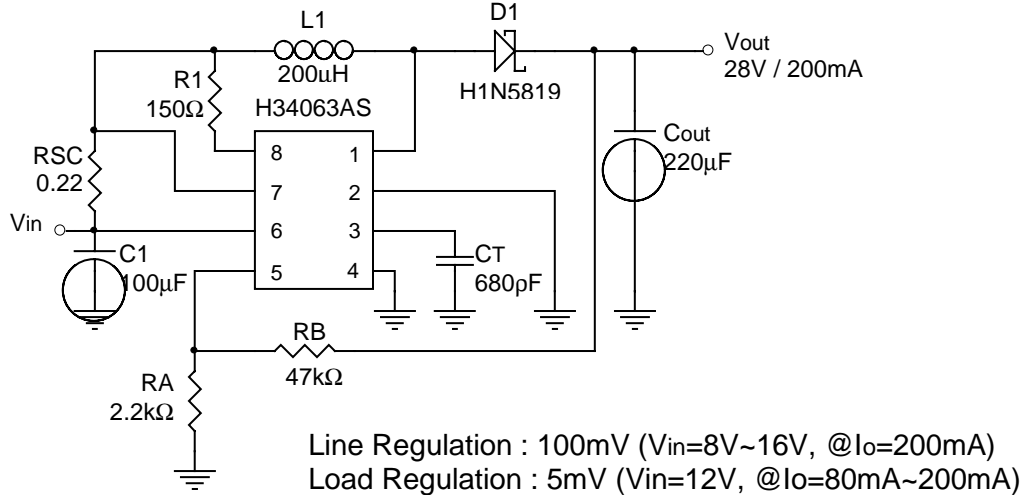


Fig.3 Step-Up Converter With External NPN Switch

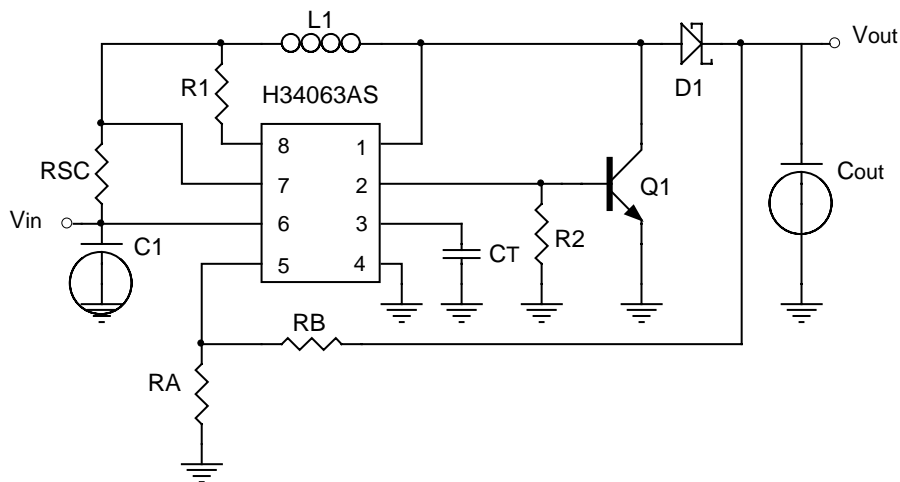


Fig.4 Step-Down Converter

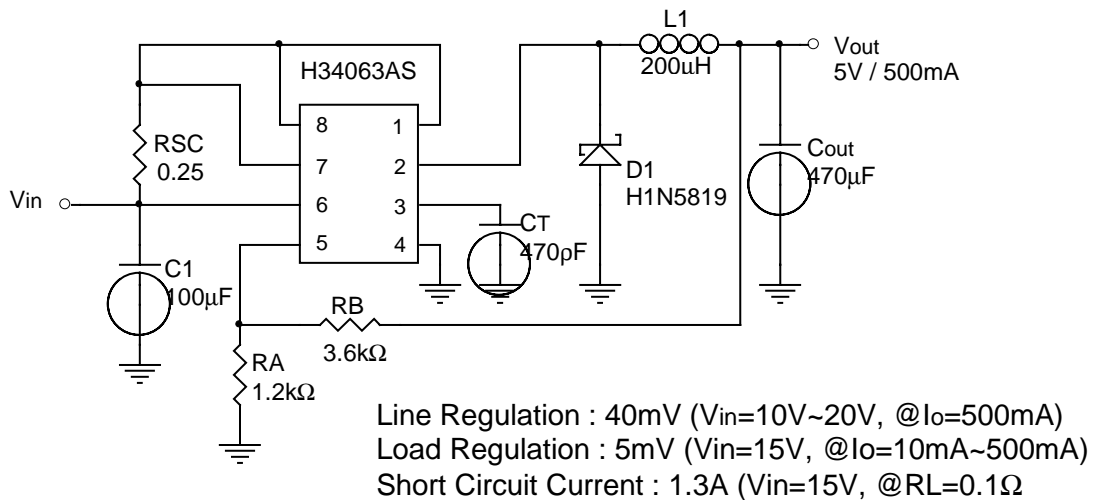




Fig.5 Step-Down Converter With External PNP Saturation Switch

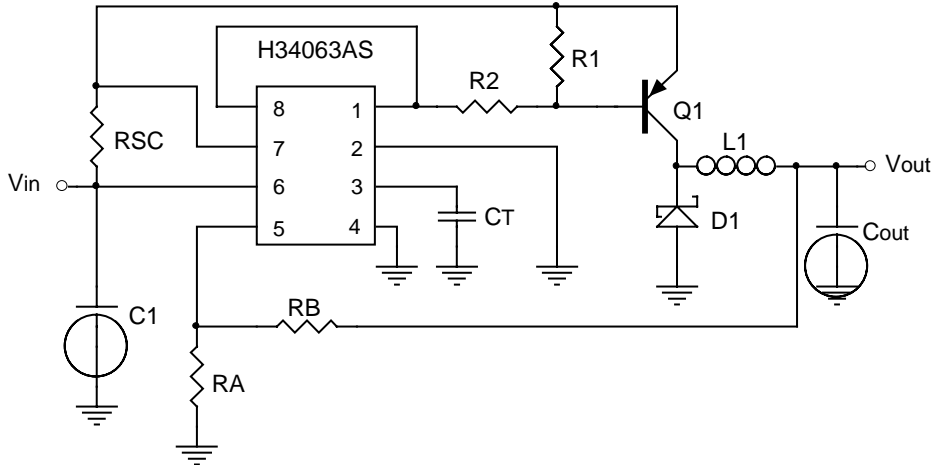


Fig.6 Voltage Inverting Converter

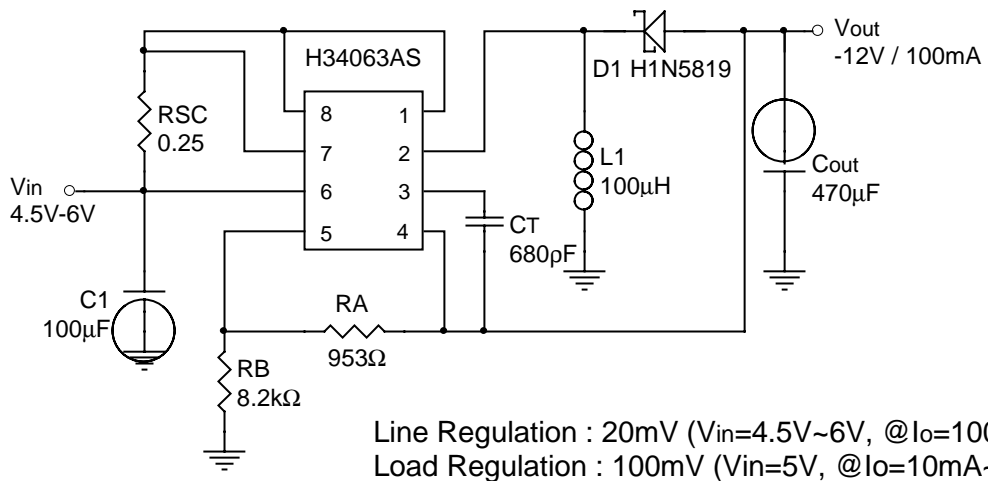
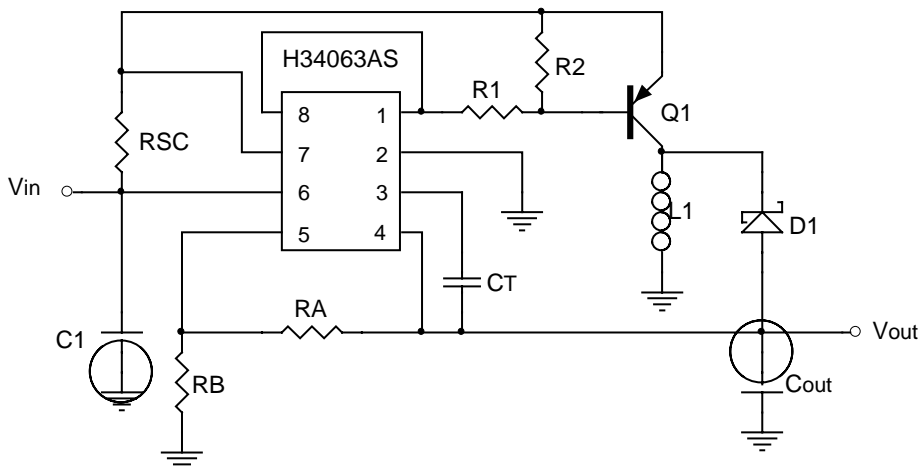
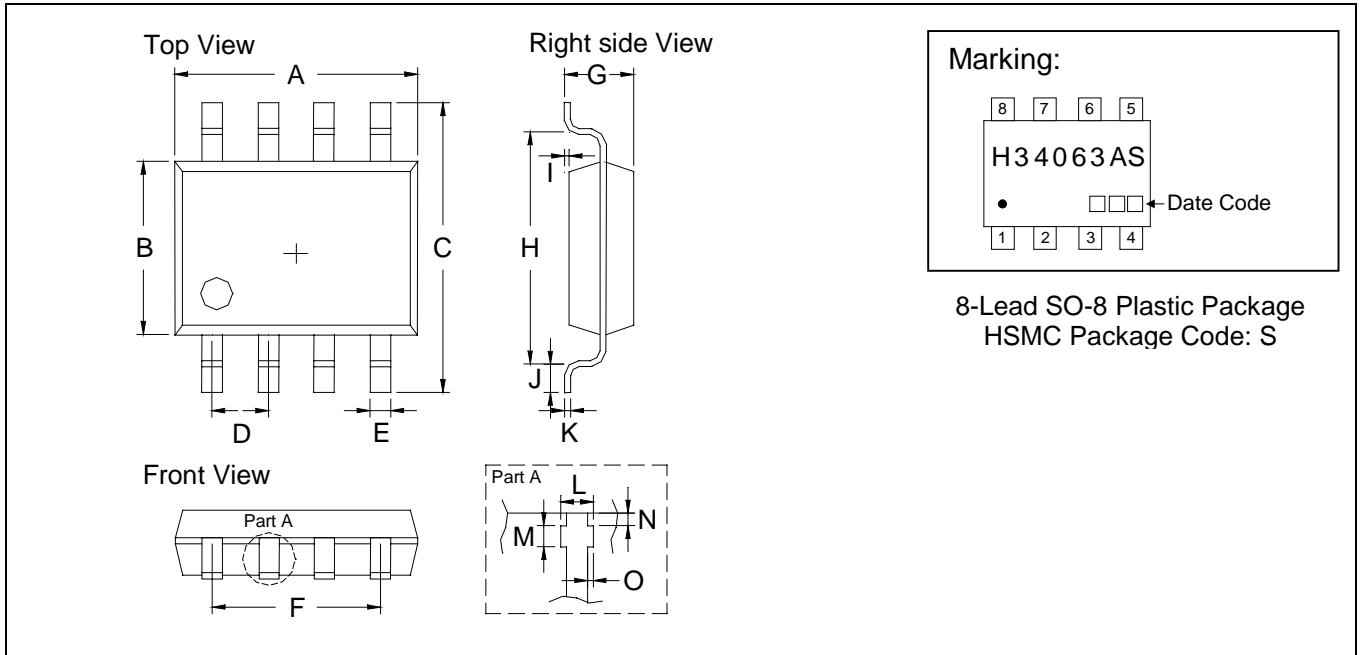


Fig.7 Voltage Inverting Converter With External PNP Saturation Switch





SO-8 Dimension



*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1909	0.2007	4.85	5.10	I	0.0019	0.0078	0.05	0.20
B	0.1515	0.1555	3.85	3.95	J	0.0118	0.0275	0.30	0.70
C	0.2283	0.2441	5.80	6.20	K	0.0074	0.0098	0.19	0.25
D	0.0480	0.0519	1.22	1.32	L	0.0145	0.0204	0.37	0.52
E	0.0145	0.0185	0.37	0.47	M	0.0118	0.0197	0.30	0.50
F	0.1472	0.1527	3.74	3.88	N	0.0031	0.0051	0.08	0.13
G	0.0570	0.0649	1.45	1.65	O	0.0000	0.0059	0.00	0.15
H	0.1889	0.2007	4.80	5.10					

- Notes: 1. Dimension and tolerance based on our Spec. dated Aug. 01, 1999.
 2. Controlling dimension: millimeters.
 3. Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
 4. If there is any question with packing specification or packing method, please contact your local HSMC sales office.

Material:

- Lead: 42 Alloy; solder plating
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

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