

GENERAL DESCRIPTION

The CM03 family is designed to improve no-load consumption IC controller.

The CM03(A)/CM03-2/CM03A1 provides excellent $R_{DS(ON)}$ and low gate charge by using advanced BiCMOS technology.

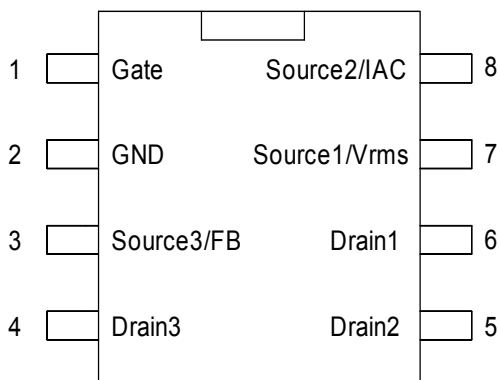
The CM03(A)/CM03-2/CM03A1 is designed to reduce the no load consumption or so called Phantom power for AC Adapter, Desk Top PC power supply, TV Power Supply and others.

FEATURES

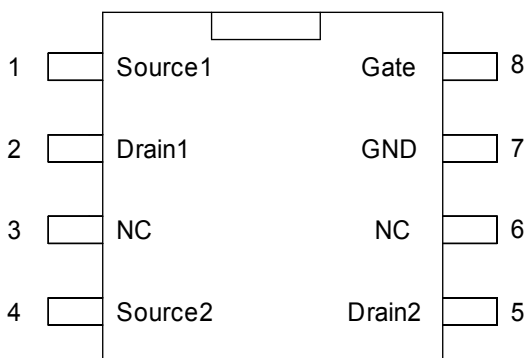
- ◆ No load consumption can be reduced ~180mw for EPA/Climate Saver Application to reduce the phantom power.
- ◆ CM03(A)/CM03-2
 $R_{DS(ON)} = 900 \Omega$ (typ.) @ $V_{GS} = 5V / I_D = 1mA$
 $R_{DS(ON)} = 1K \Omega$ (typ.) @ $V_{GS} = 2.5V / I_D = 1mA$
- ◆ CM03A1
 $R_{DS(ON)} = 700 \Omega$ (typ.) @ $V_{GS} = 10V / I_D = 1mA$
- ◆ Reliable and rugged
- ◆ Package DIP-8 / SOP-8 / TO-92A / TO-92B / SOT23 / SOT23-5
- ◆ No VCC
- ◆ CM03/CM03A : 3 MOSFET
- ◆ CM03-2 : 2 MOSFET
- ◆ CM03A1 : 1 MOSFET

PIN CONFIGURATION

CM03A DIP/SOP 8 Pin Top View

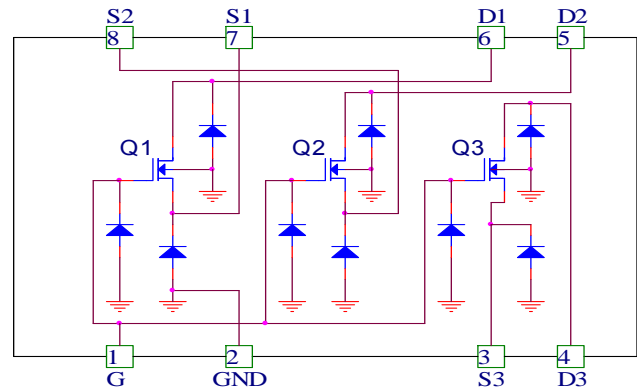


CM03-2 SOP 8 Pin Top View

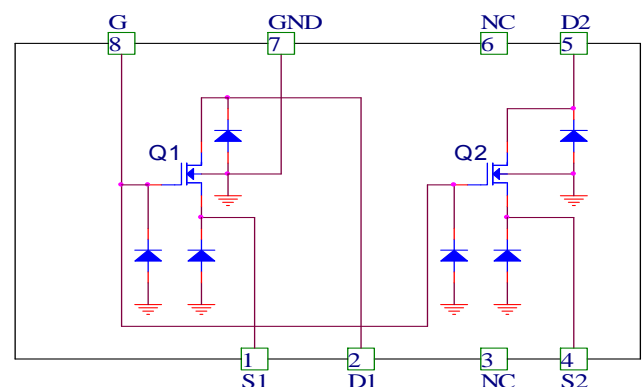


SYMBOL

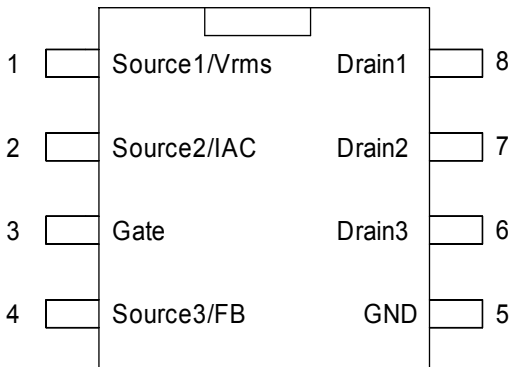
CM03A N-Channel (3 MOSFET)



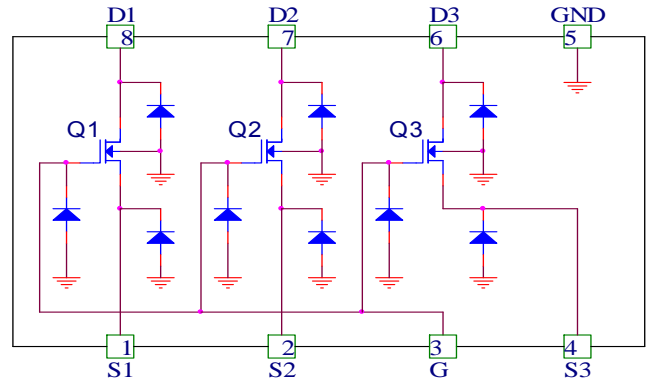
CM03-2 N-Channel (2 MOSFET)



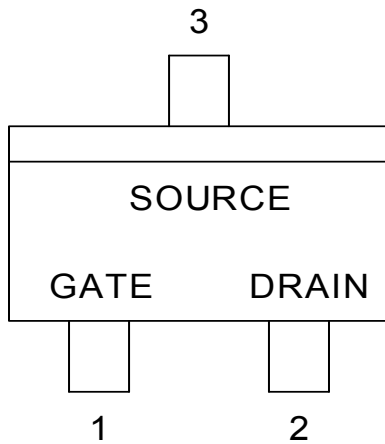
CM03 DIP/SOP 8 Pin Top View



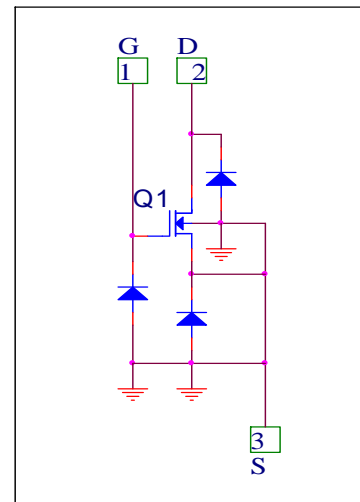
CM03 N-Channel (3 MOSFET)



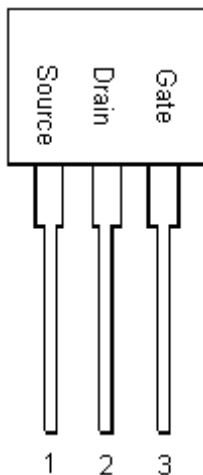
CM03A1 Sot-23 Top View



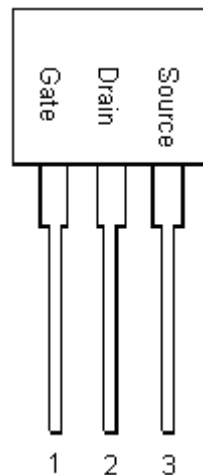
CM03A1 N-Channel (1 MOSFET)



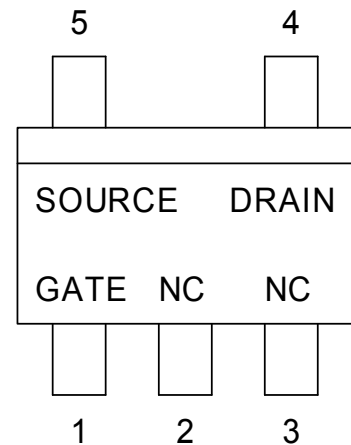
CM03 TO-92A Top View



CM03A1 TO-92B Top View



CM03A1 Sot23-5 Top View



ORDERING INFORMATION

Part Number	Temperature Range	Package
CM03AXIP*	-55°C to 150°C	8-Pin PDIP
CM03AXIS*	-55°C to 150°C	8-Pin SOP
CM03-2XIS*	-55°C to 150°C	8-Pin SOP
CM03XIP*	-55°C to 150°C	8-Pin PDIP
CM03XIS*	-55°C to 150°C	8-Pin SOP
CM03XCN*	-65°C to 150°C	TO-92A
CM03A1XIM	-40°C to +85°C	Sot-23
CM03A1XIM25	-40°C to +85°C	Sot23-5
CM03A1XCN*	-65°C to 150°C	TO-92B

*Note: X : Suffix for Halogen Free and PB Free Product

ABSOLUTE MAXIMUM RATINGS (TA=25°C, unless otherwise specified)

PARAMETER	Symbol	RATINGS	Unit
Drain-Source Voltage	V _{DSS}	800	V
Gate-Source Voltage	V _{GSS}	+20/-0.3	V
Source Pin Voltage	V _{sb}	< 8	V
Continuous Drain Current *	I _D	25	mA
Pulsed Continuous Drain Current *	I _{DM}	200	mA
Power Dissipation	P _{D (MAX)}	1.3	W
Junction Temperature	T _J	+150	°C
Storage Temperature (SOP8/DIP8)	T _{STG}	-55 ~ +150	°C
Storage Temperature (SOT23)	T _{STG}	-40 ~ +85	°C
Storage Temperature (TO-92A)	T _{STG}	-65 ~ +150	°C
Storage Temperature (TO-92B)	T _{STG}	-65 ~ +150	°C

*: Surface Mounted on 1in² pad area, t ≤ 10sec

THERMAL DATA

PARAMETER	Symbol	Min	TYP	MAX	Unit
Junction to Ambient *	θ_{JA}		74	110	$^{\circ}\text{C/W}$
Case Temperature (PDIP8)	θ_{JC}			19.2	$^{\circ}\text{C/W}$
Case Temperature (SOP8)	θ_{JC}			27.8	$^{\circ}\text{C/W}$
Case Temperature (TO-92)	θ_{JC}			22.7	$^{\circ}\text{C/W}$
Case Temperature (SOT-23)	θ_{JC}			42	$^{\circ}\text{C/W}$

* : Surface Mounted on 1in^2 pad area, $t \leq 10\text{sec}$

ELECTRICAL CHARACTERISTICS

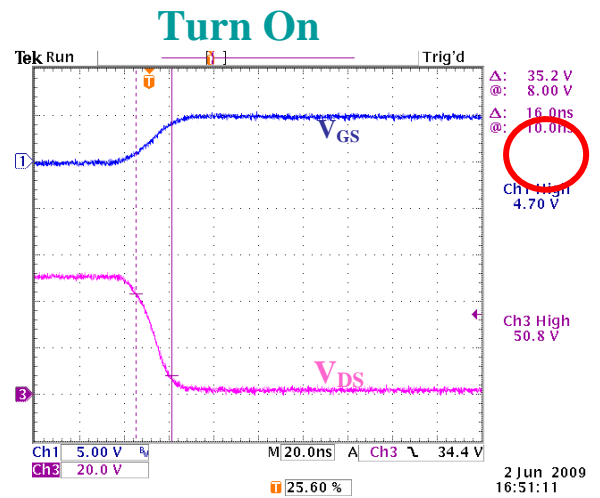
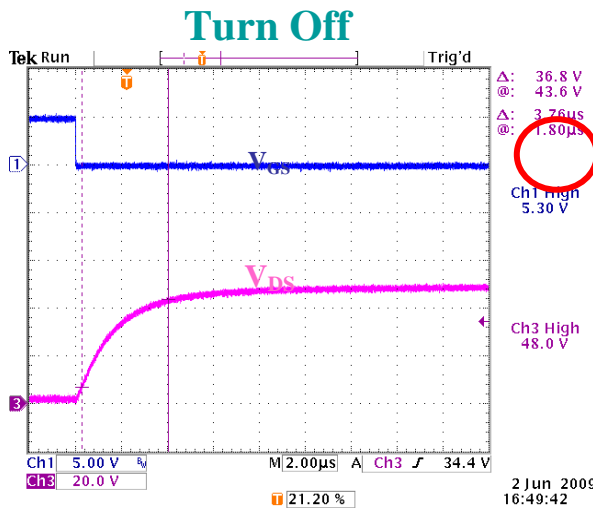
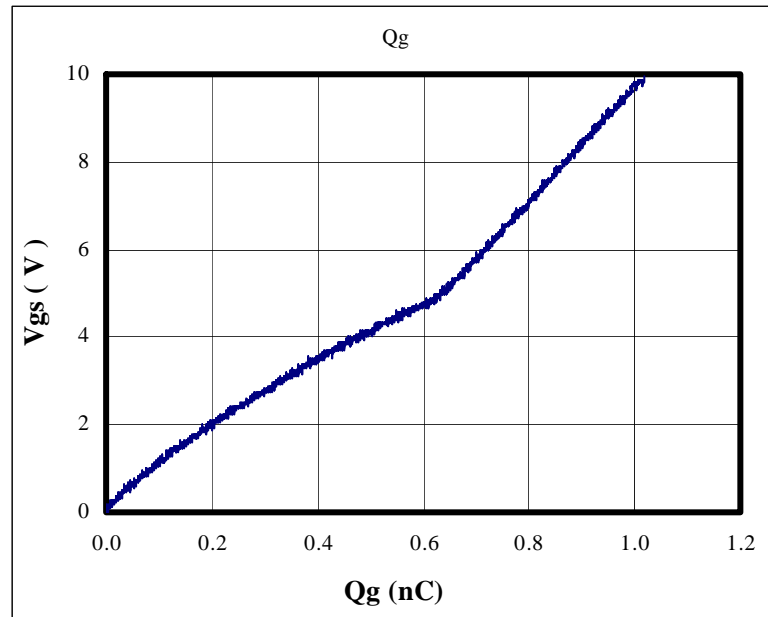
Unless otherwise specified, $T_A = 25^{\circ}\text{C}$.

PARAMETER	SYMBOL	TEST CONDITIONS	CM03(A)/CM03-2/CM03A1			
			Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=40\mu A$	800			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=500V, V_{GS}=0V$			0.1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 0.1	μA
ON CHARACTERISTICS (CM03/A)						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.9	1.1	1.3	V
Drain-Source On-State Resistance (Note 1)	$R_{DS(ON)}$	$V_{GS}=5V, I_D=1mA$		330	1K	Ω
		$V_{GS}=2.5V, I_D=1mA$		350	1K	Ω
ON CHARACTERISTICS (CM03A1)						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	3	4	5	V
Drain-Source On-State Resistance (Note 1)	$R_{DS(ON)}$	$V_{GS}=10V, I_D=1mA$		700	1.1K	Ω
SWITCHING CHARACTERISTICS						
Turn-On Delay Time (Note 1)	$t_{D(ON)}$	$V_{DS}=50V, V_{GS}=5V, R_G=3\Omega, R_L=2.7\Omega$		20		ns
Turn-On Rise Time	t_R			16		ns
Turn-Off Delay Time	$t_{D(OFF)}$			4		μs
Turn-Off Fall Time	t_F			3.7		μs
Gate-Source Charge	Q_{GS}	$V_{DS}=50V, V_{GS}=10V, I_D=25mA$		1		nC
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage (Note 1)	V_{SD}	$I_S=25mA, V_{GS}=0V$		0.76	1	V
Diode Continuous Forward Current (Note 2)	I_S			25		mA
SOURCE CHARACTERISTICS						
Normal Operating Voltage	V_{sb}		0		7	V
Breakdown Voltage	V_{sb}			10		V

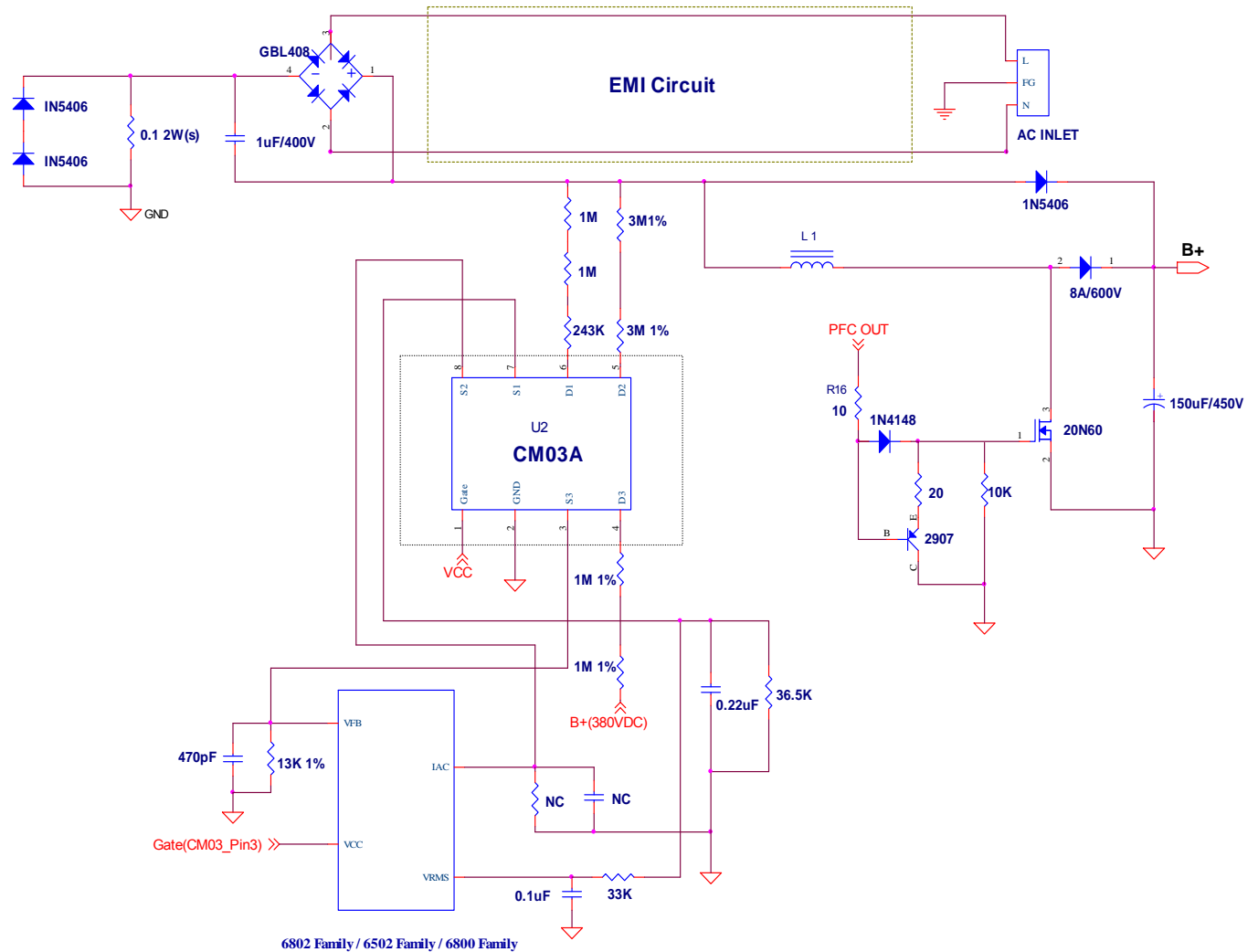
Note 1 : Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

Note 2 : Surface Mounted on 1in^2 pad area, $t \leq 10\text{sec}$

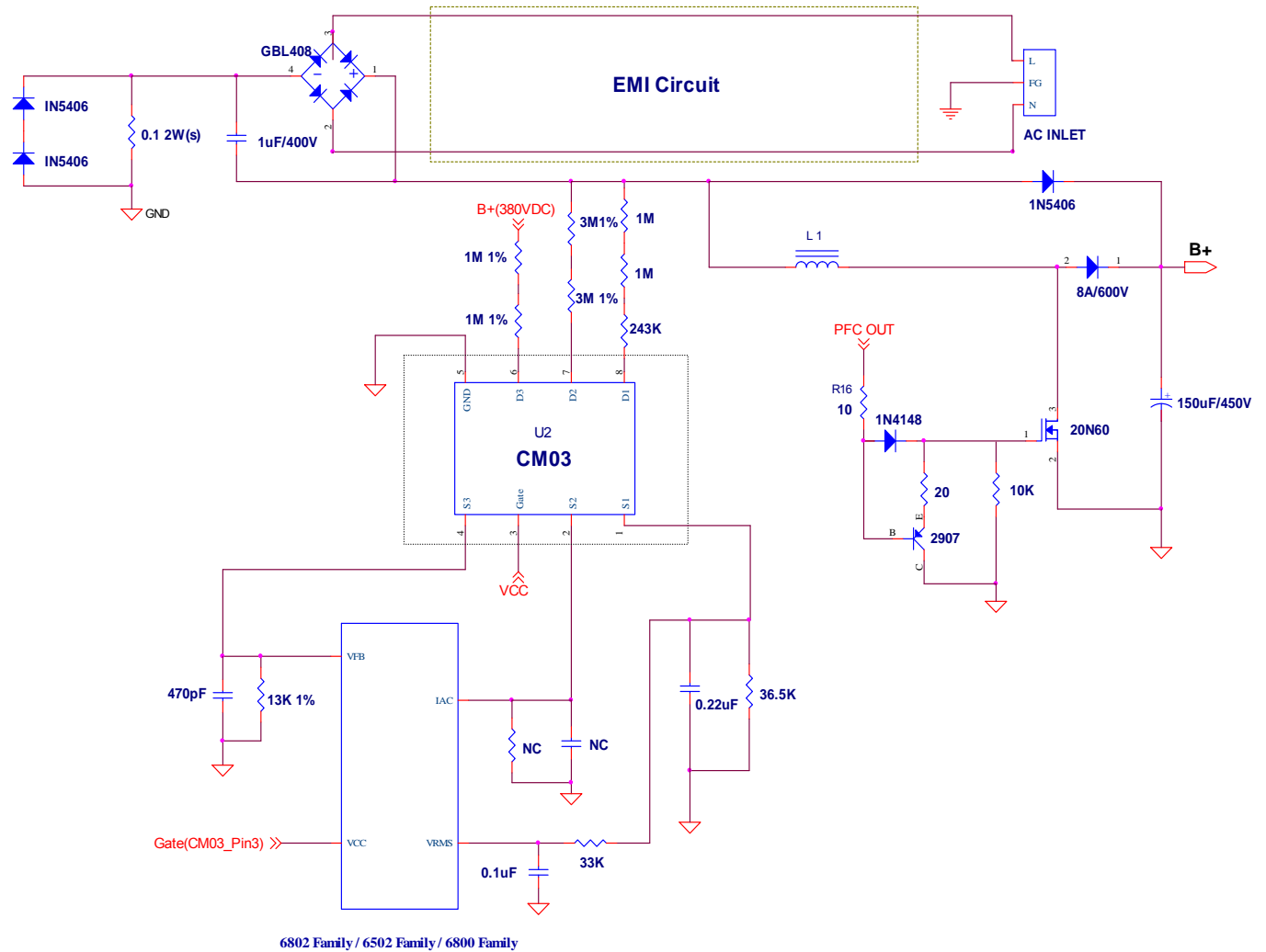
TYPICAL ELECTRICAL CHARACTERISTICS



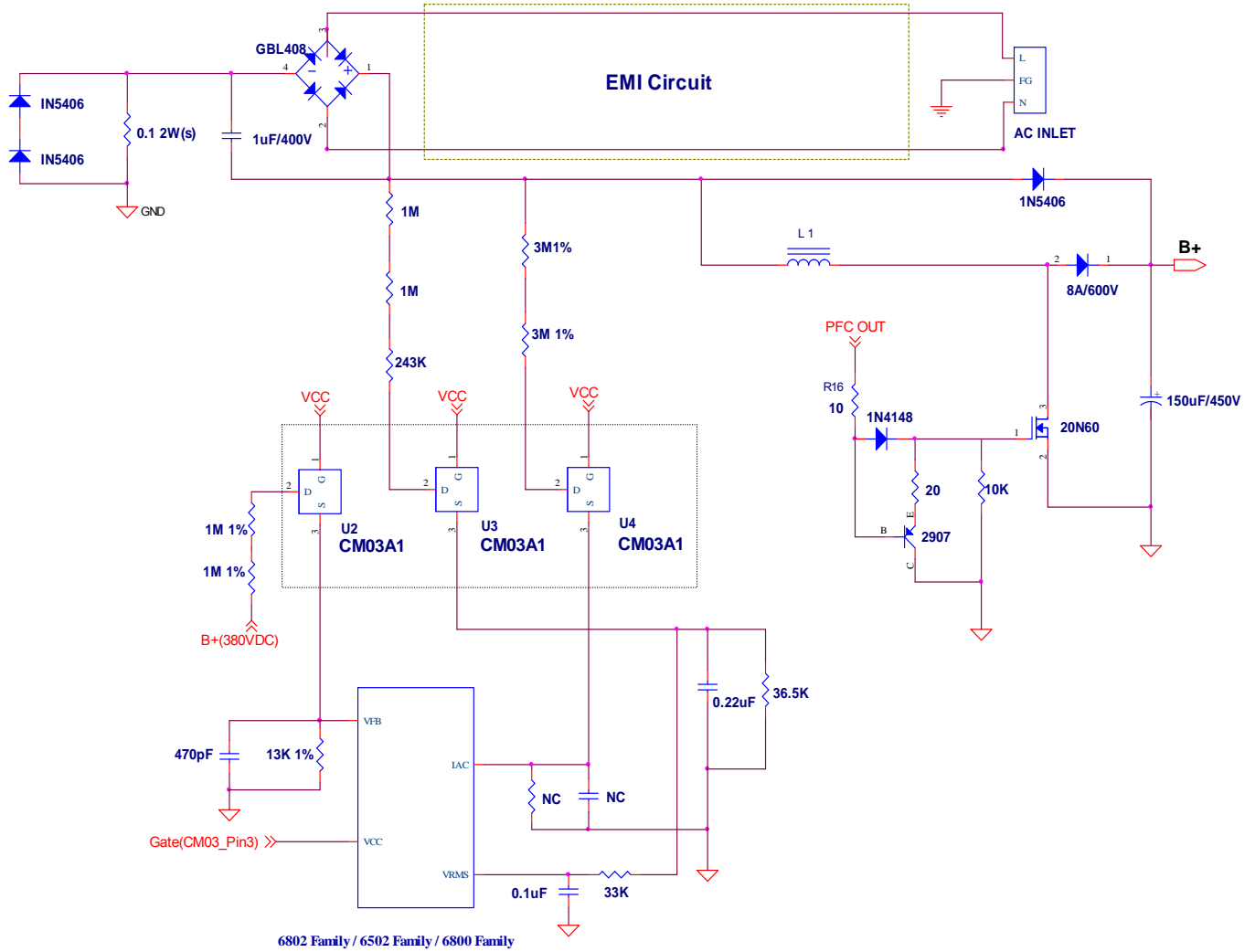
CM03A APPLICATION CIRCUIT



CM03 APPLICATION CIRCUIT

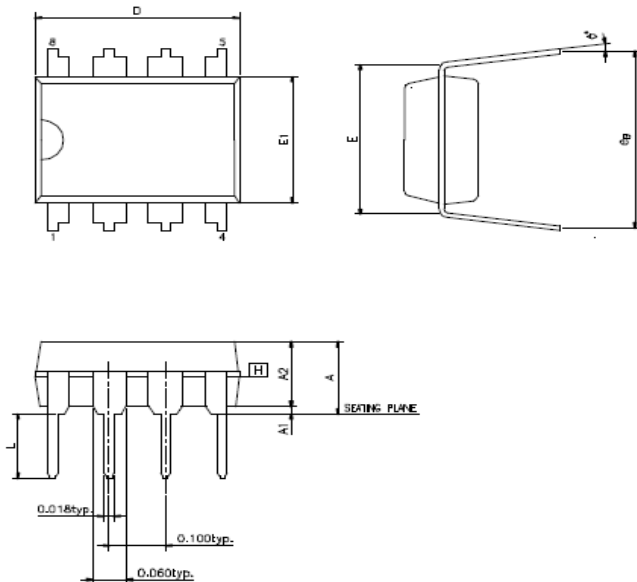


CM03A1 APPLICATION CIRCUIT



PACKAGE DIMENSION

8-PIN PDIP



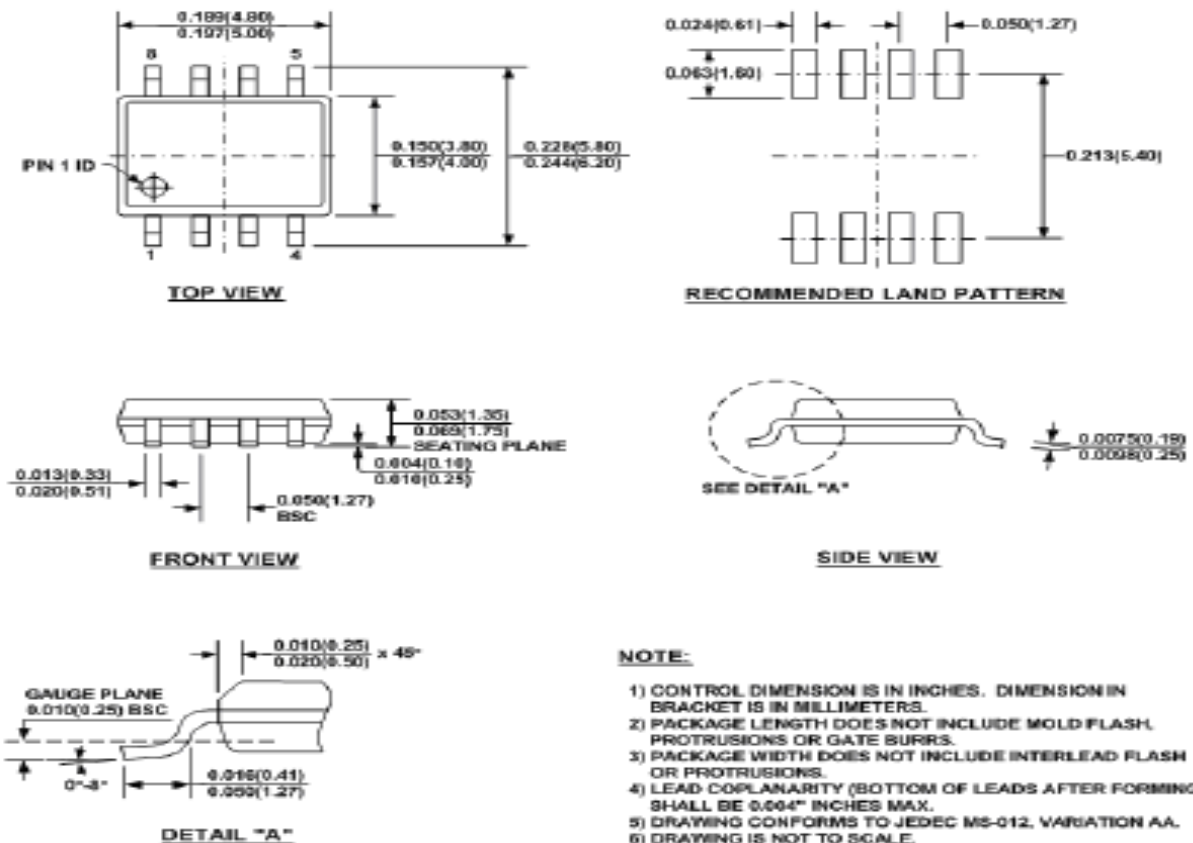
SYMBOLS	MIN.	NOR.	MAX.
A	-	-	0.210
A1	0.015	-	-
A2	0.125	0.130	0.135
D	0.355	0.365	0.400
E	0.300 BSC.		
E1	0.245	0.250	0.255
L	0.115	0.130	0.150
eB	0.335	0.355	0.375
φ	0	7	15

UNIT : INCH

NOTES:

1. JEDEC OUTLINE : MS-001 BA
2. "D", "E1" DIMENSIONS DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS. MOLD FLASH OR PROTRUSIONS SHALL NOT EXCEED .010 INCH.
3. eB IS MEASURED AT THE LEAD TIPS WITH THE LEADS UNCONSTRAINED.
4. POINTED OR ROUNDED LEAD TIPS ARE PREFERRED TO EASE INSERTION.
5. DISTANCE BETWEEN LEADS INCLUDING DAM BAR PROTRUSIONS TO BE .005 INCH MINIMUM.
6. DATUM PLANE [R] COINCIDENT WITH THE BOTTOM OF LEAD, WHERE LEAD EXITS BODY.

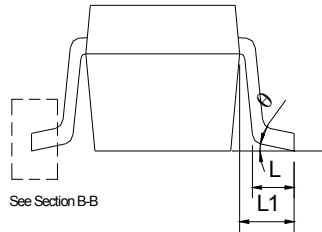
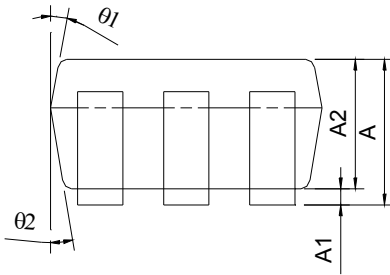
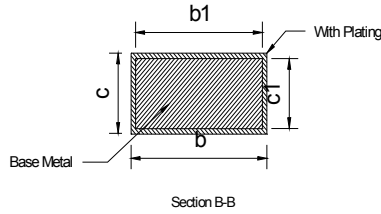
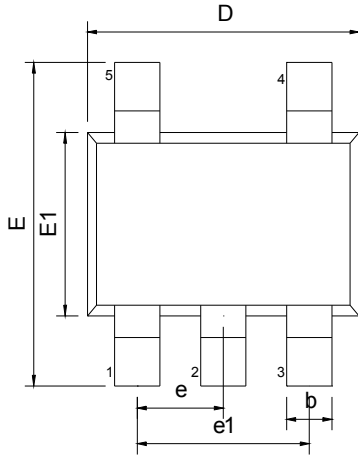
8-PIN SOP



NOTE:-

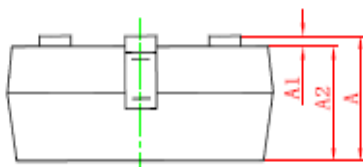
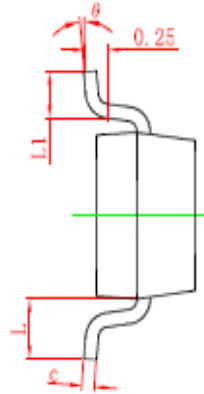
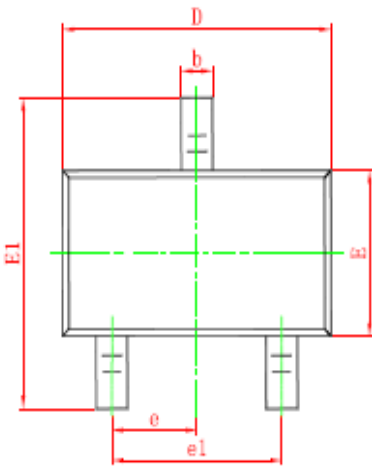
- 1) CONTROL DIMENSION IS IN INCHES. DIMENSION IN BRACKET IS IN MILLIMETERS.
- 2) PACKAGE LENGTH DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.
- 3) PACKAGE WIDTH DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSIONS.
- 4) LEAD COPLANARITY (BOTTOM OF LEADS AFTER FORMING) SHALL BE 0.004" INCHES MAX.
- 5) DRAWING CONFORMS TO JEDEC MS-012, VARIATION AA.
- 6) DRAWING IS NOT TO SCALE.

SOT23-5



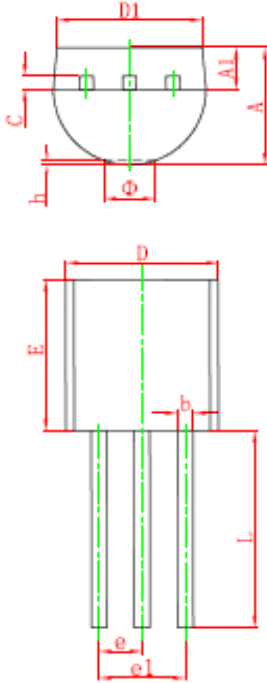
SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.05	---	1.35	0.041	---	0.053
A1	0.05	---	0.15	0.002	---	0.006
A2	1.00	1.10	1.20	0.039	0.043	0.047
b	0.25	---	0.50	0.010	---	0.020
b1	0.25	0.40	0.45	0.010	0.016	0.018
c	0.08	---	0.20	0.003	---	0.008
c1	0.08	0.11	0.15	0.003	0.004	0.006
D	2.70	2.90	3.00	0.106	0.114	0.118
E	2.60	2.80	3.00	0.102	0.110	0.118
E1	1.50	1.60	1.70	0.059	0.063	0.067
L	0.35	0.45	0.55	0.014	0.018	0.022
L1	0.60 REF			0.024 REF		
e	0.95 BSC			0.037 BSC		
e1	1.90 BSC			0.075 BSC		
theta	0°	5°	10°	0°	5°	10°
theta1	3°	5°	7°	3°	5°	7°
theta2	6°	8°	10°	6°	8°	10°

SOT-23



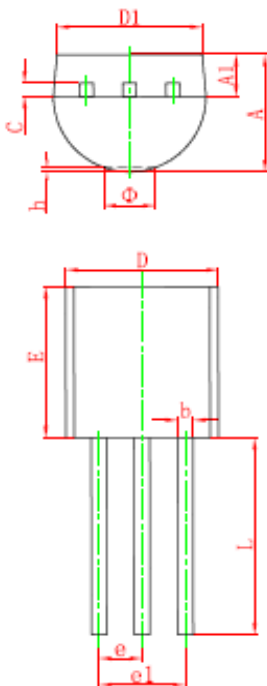
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.008
D	2.600	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
theta	0°	8°	0°	8°

TO-92A



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.300	3.700	0.130	0.146
A1	1.100	1.400	0.043	0.055
b	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.400	4.700	0.173	0.185
D1	3.430		0.135	
E	4.300	4.700	0.169	0.185
e	1.270 TYP		0.050 TYP	
e1	2.440	2.640	0.096	0.104
L	14.100	14.500	0.555	0.571
Φ		1.600		0.063
h	0.000	0.380	0.000	0.015

TO-92B



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.300	3.700	0.130	0.146
A1	1.100	1.400	0.043	0.055
b	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.400	4.700	0.173	0.185
D1	3.430		0.135	
E	4.300	4.700	0.169	0.185
e	1.270 TYP		0.050 TYP	
e1	2.440	2.640	0.096	0.104
L	14.100	14.500	0.555	0.571
Φ		1.600		0.063
h	0.000	0.380	0.000	0.015

IMPORTANT NOTICE

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