

















6-Pin DIP Zero-Cross Optoisolators Triac Driver Output (800 Volts Peak)

The MOC3081, MOC3082 and MOC3083 devices consist of gallium arsenide infrared emitting diodes optically coupled to monolithic silicon detectors performing the function of Zero Voltage Crossing bilateral triac drivers.

They are designed for use with a triac in the interface of logic systems to equipment powered from 240 Vac lines, such as solid–state relays, industrial controls, motors, solenoids and consumer appliances, etc.

- Simplifies Logic Control of 240 Vac Power
- Zero Voltage Crossing
- dv/dt of 1500 V/μs Typical, 600 V/μs Guaranteed
- To order devices that are tested and marked per VDE 0884 requirements, the suffix "V" must be included at end of part number. VDE 0884 is a test option.

Recommended for 240 Vac(rms) Applications:

Rating

- Solenoid/Valve Controls
- Lighting Controls
- · Static Power Switches
- AC Motor Drives

• Temperature Controls

Value

Unit

- E.M. Contactors
- AC Motor Starters
- Solid State Relays

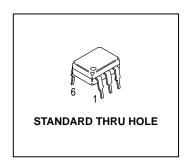
Symbol

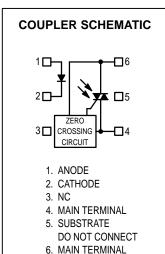
MAXIMUM RATINGS

_	1 '		l
INPUT LED			
Reverse Voltage	٧R	6	Volts
Forward Current — Continuous	IF	60	mA
Total Power Dissipation @ T _A = 25°C Negligible Power in Output Driver Derate above 25°C	PD	120 1.41	mW mW/°C
OUTPUT DRIVER			
Off-State Output Terminal Voltage	V _{DRM}	800	Volts
Peak Repetitive Surge Current (PW = 100 μs, 120 pps)	ITSM	1	А
Total Power Dissipation @ T _A = 25°C Derate above 25°C	PD	150 1.76	mW mW/°C
TOTAL DEVICE	•		
Isolation Surge Voltage ⁽¹⁾ (Peak ac Voltage, 60 Hz, 1 Second Duration)	Viso	7500	Vac(pk)
Total Power Dissipation @ T _A = 25°C Derate above 25°C	PD	250 2.94	mW mW/°C
Junction Temperature Range	TJ	-40 to +100	°C
Ambient Operating Temperature Range	TA	-40 to +85	°C
Storage Temperature Rang	T _{stg}	-40 to +150	°C
Soldering Temperature (10 s)	TL	260	°C

Isolation surge voltage, V_{ISO}, is an internal device dielectric breakdown rating. For this test, Pins 1 and 2 are common, and Pins 4, 5 and 6 are common.

MOC3081 MOC3082 MOC3083





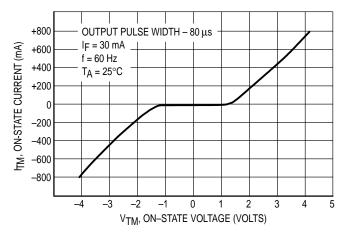


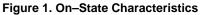
ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Тур	Max	Unit
INPUT LED	<u> </u>				
Reverse Leakage Current (V _R = 6 V)	I _R	_	0.05	100	μА
Forward Voltage (I _F = 30 mA)	VF	_	1.3	1.5	Volts
OUTPUT DETECTOR (I _F = 0)	-				
Leakage with LED Off, Either Direction (V _{DRM} = 800 V ⁽¹⁾)	IDRM1	_	80	500	nA
Critical Rate of Rise of Off–State Voltage ⁽³⁾	dv/dt	600	1500	_	V/μs
COUPLED	-				
LED Trigger Current, Current Required to Latch Output (Main Terminal Voltage = 3 V ⁽²⁾) MOC3081 MOC3082 MOC3083	lFT	=	_ _ _	15 10 5	mA
Peak On–State Voltage, Either Direction (I _{TM} = 100 mA, I _F = Rated I _{FT})	VTM	_	1.8	3	Volts
Holding Current, Either Direction	lн	_	250	_	μΑ
Inhibit Voltage (MT1–MT2 Voltage above which device will not trigger) (IF = Rated IFT)	VINH	_	5	20	Volts
Leakage in Inhibited State (I _F = Rated I _{FT} , V _{DRM} = 800 V, Off State)	I _{DRM2}	_	300	500	μА

- 1. Test voltage must be applied within dv/dt rating.
- 2. All devices are guaranteed to trigger at an I_F value less than or equal to max I_FT. Therefore, recommended operating I_F lies between max I_FT (15 mA for MOC3081, 10 mA for MOC3082, 5 mA for MOC3083) and absolute max I_F (60 mA).
- 3. This is static dv/dt. See Figure 7 for test circuit. Commutating dv/dt is a function of the load-driving thyristor(s) only.

TYPICAL CHARACTERISTICS





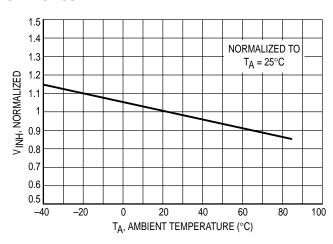


Figure 2. Inhibit Voltage versus Temperature





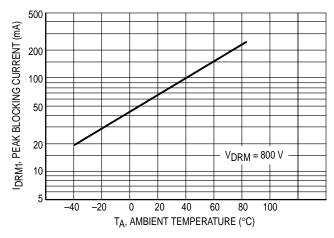


Figure 3. Leakage with LED Off versus Temperature

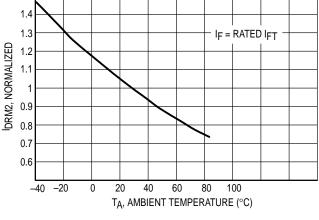


Figure 4. IDRM2, Leakage in Inhibit State versus Temperature

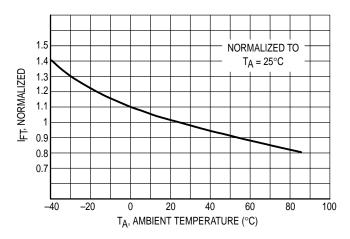


Figure 5. Trigger Current versus Temperature

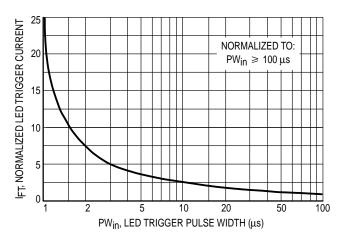
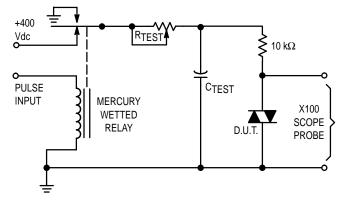


Figure 6. LED Current Required to Trigger versus LED Pulse Width



- The mercury wetted relay provides a high speed repeated pulse to the D.U.T.
- 2. 100x scope probes are used, to allow high speeds and voltages.
- 3. The worst–case condition for static dv/dt is established by triggering the D.U.T. with a normal LED input current, then removing the current. The variable RTEST allows the dv/dt to be gradually increased until the D.U.T. continues to trigger in response to the applied voltage pulse, even after the LED current has been removed. The dv/dt is then decreased until the D.U.T. stops triggering. TRC is measured at this point and recorded.

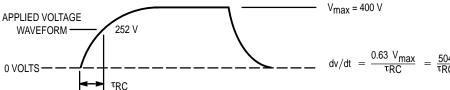
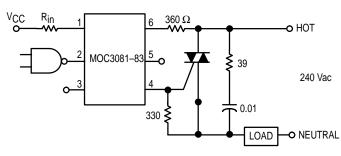


Figure 7. Static dv/dt Test Circuit

MOC3081, MOC3082, MOC3083



* For highly inductive loads (power factor < 0.5), change this value to 360 ohms.

Typical circuit for use when hot line switching is required. In this circuit the "hot" side of the line is switched and the load connected to the cold or neutral side. The load may be connected to either the neutral or hot line.

 $R_{\mbox{\scriptsize in}}$ is calculated so that IF is equal to the rated IFT of the part, 15 mA for the MOC3081, 10 mA for the MOC3082, and 5 mA for the MOC3083. The 39 ohm resistor and 0.01 μF capacitor are for snubbing of the triac and may or may not be necessary depending upon the particular triac and load used.

Figure 8. Hot-Line Switching Application Circuit

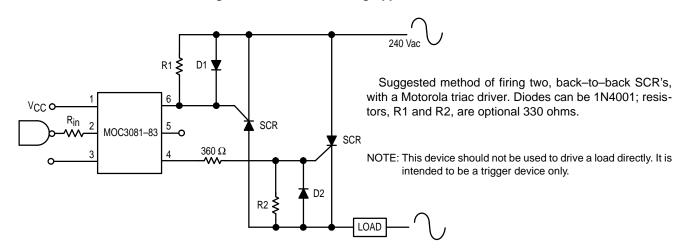
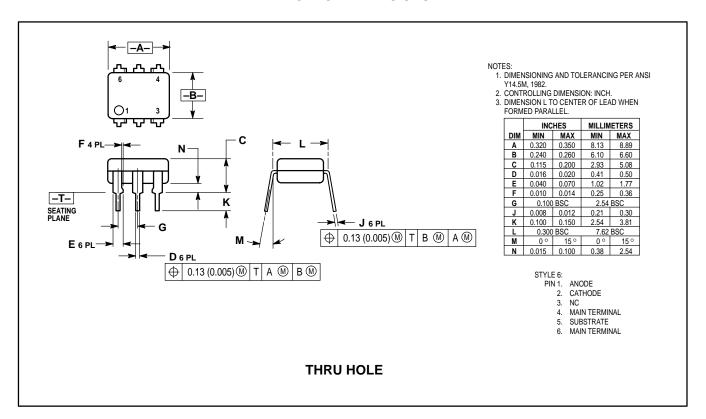
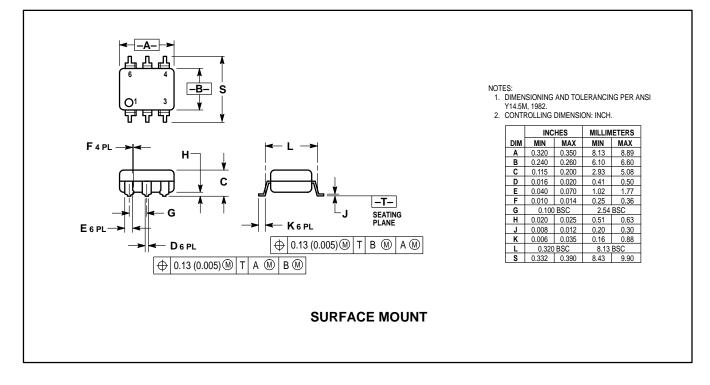


Figure 9. Inverse-Parallel SCR Driver Circuit



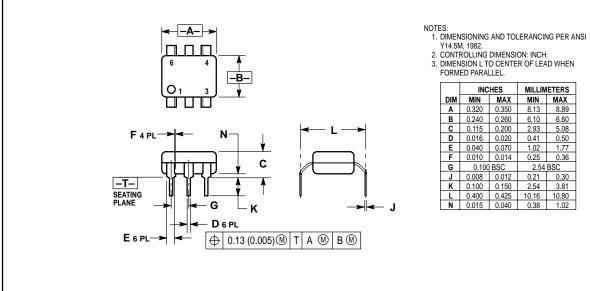
PACKAGE DIMENSIONS







MOC3081, MOC3082, MOC3083



	INC	HES	MILLIN	IETERS
DIM	MIN	MAX	MIN	MAX
Α	0.320	0.350	8.13	8.89
В	0.240	0.260	6.10	6.60
С	0.115	0.200	2.93	5.08
D	0.016	0.020	0.41	0.50
E	0.040	0.070	1.02	1.77
F	0.010	0.014	0.25	0.36
G	0.100	BSC	2.54	BSC
J	0.008	0.012	0.21	0.30
K	0.100	0.150	2.54	3.81
L	0.400	0.425	10.16	10.80
N	0.015	0.040	0.38	1.02

0.4" LEAD SPACING



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- 2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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Ordering information

• To order devices that are tested and marked per VDE 0884 requirements, the suffix "V" must be included at end of part number. VDE 0884 is a test option.

The following options can be ordered with this part:

Option	Order Entry Identifier	Description	
F	F	Low profile, surface mount	
S	S	Surface mount	
T	Т	0.4" Lead bend	
V	V	VDE 0884	
FV	FV	Low profile, surface mount; VDE 0884	
SV	SV	Surface mount; VDE 0884	
TV	TV	0.4" Lead bend; VDE 0884	
FR2	FR2	Low profile, surface mount; T&R	
FR2V	FR2V	Low profile, surface mount; T&R VDE 0884	
SR2	SR2	Surface mount; T&R	
SR2V	SR2V	Surface mount; T&R VDE 0884	

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Product status/pricing/packaging

Product	Product status	Pricing*	Package type	Leads	Packing method
MOC3081F-M	Full Production	\$0.63	N/A	N/A	RAIL
MOC3081FR2-M	Full Production	\$0.64	DIP	6	TAPE REEL
MOC3081FR2V-M	Full Production	\$0.64	DIP	6	TAPE REEL
MOC3081FV-M	Full Production	\$0.63	N/A	N/A	RAIL
MOC3081-M	Full Production	\$0.62	N/A	N/A	RAIL
MOC3081S-M	Full Production	\$0.62	N/A	N/A	RAIL
MOC3081SR2-M	Full Production	\$0.62	DIP	6	TAPE REEL
MOC3081SR2V-M	Full Production	\$0.62	DIP	6	TAPE REEL
MOC3081SV-M	Full Production	\$0.62	DIP	6	RAIL
MOC3081T-M	Full Production	\$0.62	N/A	N/A	RAIL
MOC3081TV-M	Full Production	\$0.62	N/A	N/A	RAIL
MOC3081V-M	Full Production	\$0.62	N/A	N/A	RAIL

^{* 1,000} piece Budgetary Pricing

Safety agency certificates

Cetificate	Agency		
310983-01 (95 K)	DEMKO	DEMKO Testing & Certification	
P01101866 (383 K)	NEMKO	NEMKO	
<u>CR/0117</u> (424 K)	BABT	British Approvals Board of Telecommunications	
<u>102497</u> (1629 K)	VDE	VDE Pruf-und Zertifizierungsinstitut	
<u>1113639</u> (111 K)	CSA	Canadian Standards Association	
<u>0134082</u> (136 K)	SEMKO	SEMKO	
<u>FI 17434</u> (47 K)	FIMKO	FIMKO	
<u>E90700, Vol. 2</u> (254 K)	UL	Underwriters Laboratories Inc.	

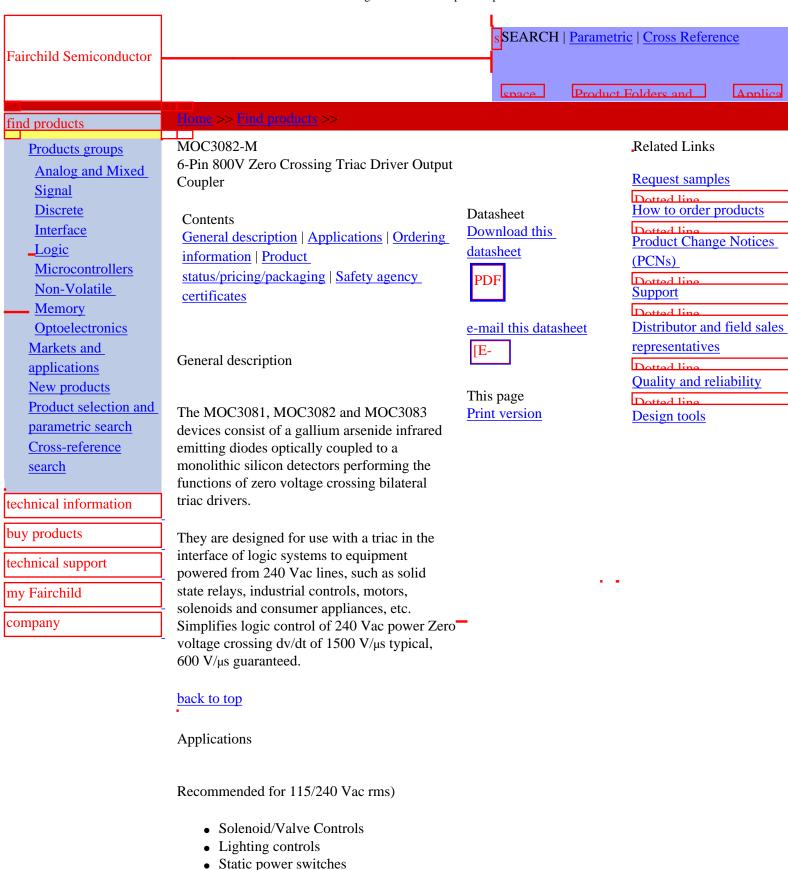
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Product status/pricing/packaging

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MOC3082F-M	Full Production	\$0.65	N/A	N/A	RAIL
MOC3082FR2-M	Full Production	\$0.66	DIP	6	TAPE REEL
MOC3082FR2V-M	Full Production	\$0.66	DIP	6	TAPE REEL
MOC3082FV-M	Full Production	\$0.65	N/A	N/A	RAIL
MOC3082-M	Full Production	\$0.63	N/A	N/A	RAIL
MOC3082S-M	Full Production	\$0.63	N/A	N/A	RAIL
MOC3082SR2-M	Full Production	\$0.64	DIP	6	TAPE REEL
MOC3082SR2V-M	Full Production	\$0.64	DIP	6	TAPE REEL
MOC3082SV-M	Full Production	\$0.63	DIP	6	RAIL
MOC3082T-M	Full Production	\$0.63	N/A	N/A	RAIL
MOC3082TV-M	Full Production	\$0.63	N/A	N/A	RAIL
MOC3082V-M	Full Production	\$0.63	N/A	N/A	RAIL

^{* 1,000} piece Budgetary Pricing

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P01101866 (383 K)	NEMKO	NEMKO
<u>CR/0117</u> (424 K)	BABT	British Approvals Board of Telecommunications
102497 (1629 K)	VDE	VDE Pruf-und Zertifizierungsinstitut
<u>1113639</u> (111 K)	CSA	Canadian Standards Association
<u>0134082</u> (136 K)	SEMKO	SEMKO
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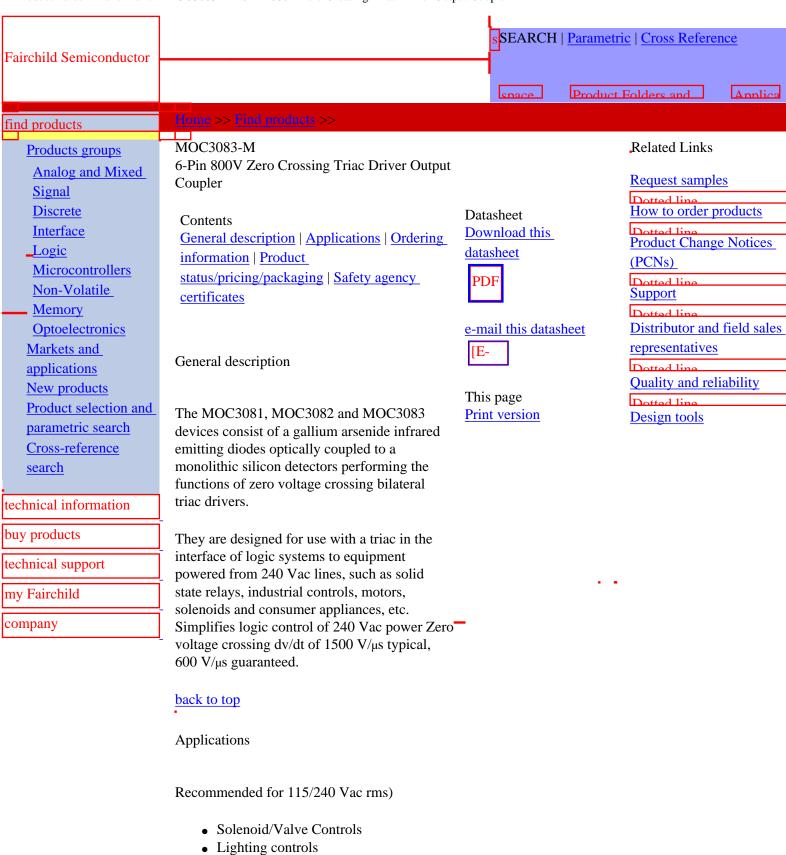
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FR2V	FR2V	Low profile, surface mount; T&R VDE 0884	
SR2	SR2	Surface mount; T&R	
SR2V	SR2V	Surface mount; T&R VDE 0884	

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MOC3083F-M	Full Production	\$0.72	N/A	N/A	RAIL
MOC3083FR2-M	Full Production	\$0.73	DIP	6	TAPE REEL
MOC3083FR2V-M	Full Production	\$0.73	DIP	6	TAPE REEL
MOC3083FV-M	Full Production	\$0.72	N/A	N/A	RAIL
MOC3083-M	Full Production	\$0.70	N/A	N/A	RAIL
MOC3083S-M	Full Production	\$0.70	N/A	N/A	RAIL
MOC3083SR2-M	Full Production	\$0.71	DIP	6	TAPE REEL
MOC3083SR2V-M	Full Production	\$0.71	DIP	6	TAPE REEL
MOC3083SV-M	Full Production	\$0.70	DIP	6	RAIL
MOC3083T-M	Full Production	\$0.70	N/A	N/A	RAIL
MOC3083TV-M	Full Production	\$0.70	N/A	N/A	RAIL
MOC3083V-M	Full Production	\$0.70	N/A	N/A	RAIL

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Safety agency certificates

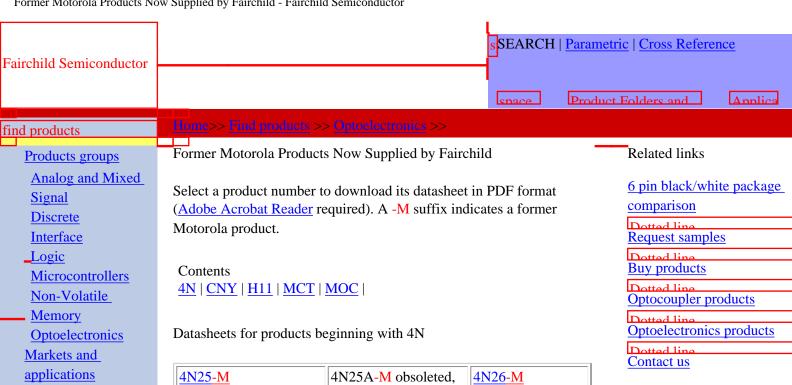
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4N25-M	4N25A-M obsoleted, no replacement	4N26-M
4N27-M	4N28-M	4N29-M replaced by 4N29
4N29A-M replaced by 4N29	4N30-M replaced by 4N30	4N31-M replaced by 4N31
4N32-M replaced by 4N32	4N33-M replaced by 4N33	4N35-M
4N36-M	4N37-M	4N38-M replaced by 4N38
4N38A-M replaced by 4N38		

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H11AV1A-M	H11AV2-M	H11AV2A-M
H11B1-M replaced by H11B1	H11B3-M replaced by H11B3	H11D1-M replaced by H11D1
H11D2-M replaced by H11D2	H11G1-M replaced by H11G1	H11G2-M replaced by H11G2
H11G3-M replaced by H11G3	H11L1-M	H11L2-M
H11L3-M		

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MOC205-M	MOC206-M	MOC207-M
MOC208-M	MOC211-M	MOC212-M
<u>MOC213-M</u>	MOC215-M	MOC216-M
MOC217-M	MOC223-M	MOC256-M
MOC3010-M	MOC3011-M	MOC3012-M
MOC3020-M	MOC3021-M	MOC3022-M
MOC3023-M	MOC3031-M	MOC3032-M
MOC3033-M	MOC3041-M	MOC3042-M
MOC3043-M	MOC3051-M	MOC3052-M
MOC3061-M	MOC3062-M	MOC3063-M
MOC3081-M	MOC3081-M	MOC3083-M
MOC3162-M	MOC3163-M	MOC5007-M
MOC5008-M	MOC5009-M	MOC8030-M replaced by MOC8030

Former Motorola Products Now Supplied by Fairchild - Fairchild Semiconductor

MOC8050-M replaced by MOC8050	MOC8080-M replaced by MOC8080	MOC8100-M
MOC8204-M replaced by MOC8204	MOCD207-M	MOCD208-M
MOCD211-M	MOCD213-M	MOCD217-M
MOCD223-M		

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