







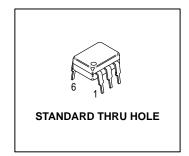


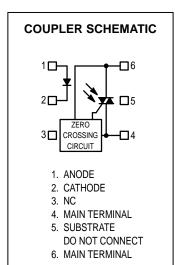






MOC3061 MOC3062 MOC3063





6-Pin DIP Zero-Cross Optoisolators Triac Driver Output (600 Volts Peak)

The MOC3061, MOC3062 and MOC3063 devices consist of gallium arsenide infrared emitting diodes optically coupled to monolithic silicon detectors performing the functions 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 115/240 Vac lines, such as solid–state relays, industrial controls, motors, solenoids and consumer appliances, etc.

- Simplifies Logic Control of 115/240 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 115/240 Vac(rms) Applications:

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

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

MAXIMUM RATINGS

Rating	Symbol	Value	Unit			
INFRARED EMITTING DIODE						
Reverse Voltage	V _R	6	Volts			
Forward Current — Continuous	lF	60	mA			
Total Power Dissipation @ T _A = 25°C Negligible Power in Output Driver	PD	120	mW			
Derate above 25°C 1.41 mW/°C DUTPUT DRIVER						

Off-State Output Terminal Voltage 600 Volts V_{DRM} Peak Repetitive Surge Current 1 Α ITSM $(PW = 100 \mu s, 120 pps)$ Total Power Dissipation @ T_A = 25°C P_{D} 150 mW Derate above 25°C 1.76 mW/°C

TOTAL DEVICE

TOTAL DEVICE			
Isolation Surge Voltage ⁽¹⁾ (Peak ac Voltage, 60 Hz, 1 Second Duration)	V _{ISO}	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 Range	T _{stg}	-40 to +150	°C
Soldering Temperature (10 s)	TL	260	°C

^{1.} 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.



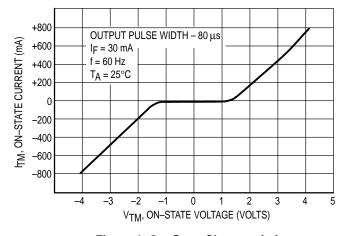
ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

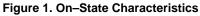
Characteristic	Symbol	Min	Тур	Max	Unit
NPUT LED					
Reverse Leakage Current (V _R = 6 V)	IR	_	0.05	100	μА
Forward Voltage (I _F = 30 mA)	VF	_	1.3	1.5	Volts
DUTPUT DETECTOR (I _F = 0)					
Leakage with LED Off, Either Direction (Rated V _{DRM} ⁽¹⁾)	I _{DRM1}	_	60	500	nA
Critical Rate of Rise of Off–State Voltage ⁽³⁾	dv/dt	600	1500	_	V/μs
COUPLED		•			
LED Trigger Current, Current Required to Latch Output (Main Terminal Voltage = 3 V ⁽²⁾) MOC3061 MOC3062 MOC3063	I _{FT}			15 10 5	mA
Peak On–State Voltage, Either Direction (I _{TM} = 100 mA, I _F = Rated I _{FT})	V _{TM}	_	1.8	3	Volts
Holding Current, Either Direction	lΗ	_	250	_	μΑ
Inhibit Voltage (MT1–MT2 Voltage above which device will not trigger.) (I _F = Rated I _{FT})	VINH	_	5	20	Volts
Leakage in Inhibited State (I _F = Rated I _{FT} , Rated V _{DRM} , Off State)	I _{DRM2}	_	_	500	μА
Isolation Voltage (f = 60 Hz, t = 1 sec)	VISO	7500	_	_	Vac(pk)

- 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 MOC3061, 10 mA for MOC3062, 5 mA for MOC3063) 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

 $T_A = 25^{\circ}C$





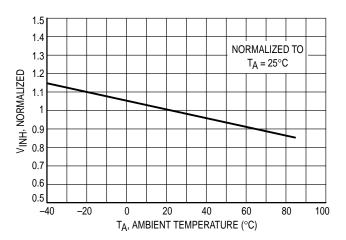


Figure 2. Inhibit Voltage versus Temperature





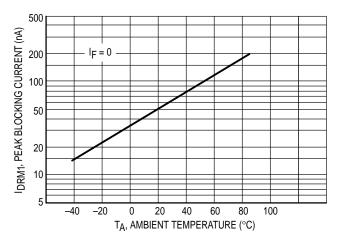


Figure 3. Leakage with LED Off versus Temperature

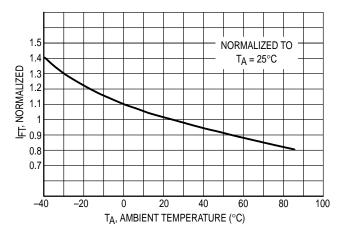
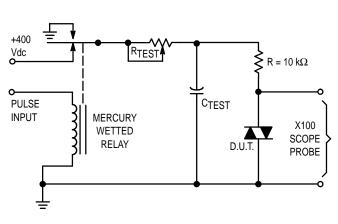
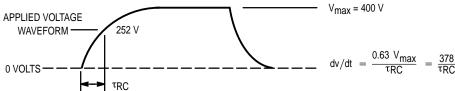


Figure 5. Trigger Current versus Temperature





1.5 1.4 1.3 IF = RATED IFT IDRM2, NORMALIZED 1.2 1.1 0.9 0.8 0.7 0.6 60 80 -20 40 TA, AMBIENT TEMPERATURE (°C)

Figure 4. IDRM2, Leakage in Inhibit State versus Temperature

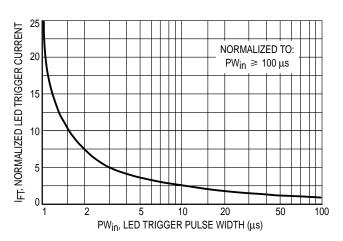


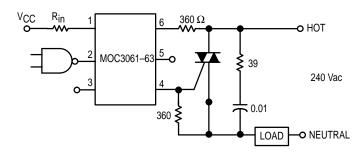
Figure 6. LED Current Required to Trigger versus LED Pulse Width

- 1. The mercury wetted relay provides a high speed repeated pulse to the D.U.T.
- 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. τRC is measured at this point and recorded.

Figure 7. Static dv/dt Test Circuit



MOC3061, MOC3062, MOC3063



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 MOC3061, 10 mA for the MOC3062, and 5 mA for the MOC3063. 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

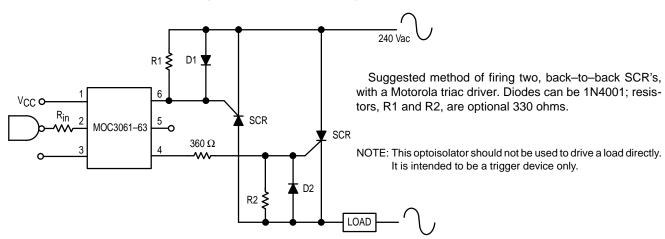
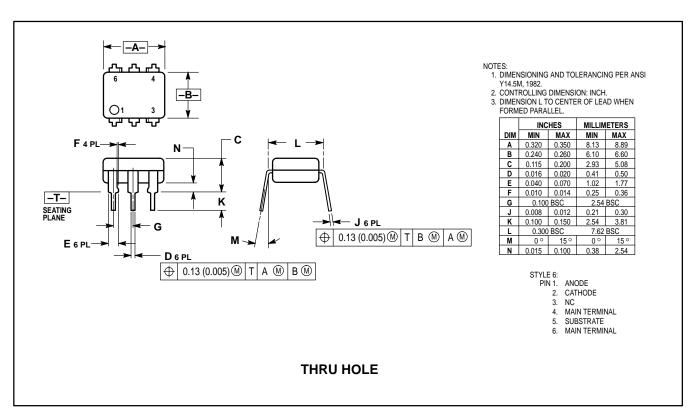


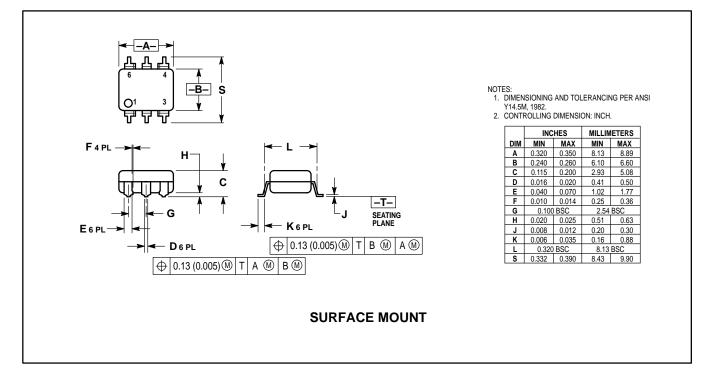
Figure 9. Inverse-Parallel SCR Driver Circuit





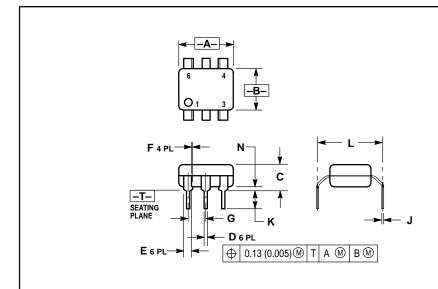
PACKAGE DIMENSIONS











- NOTES:

 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.

 2. CONTROLLING DIMENSION: INCH.

 3. DIMENSION L TO CENTER OF LEAD WHEN FORMED PARALLEL.

	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	
Е	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



DISCLAIMER

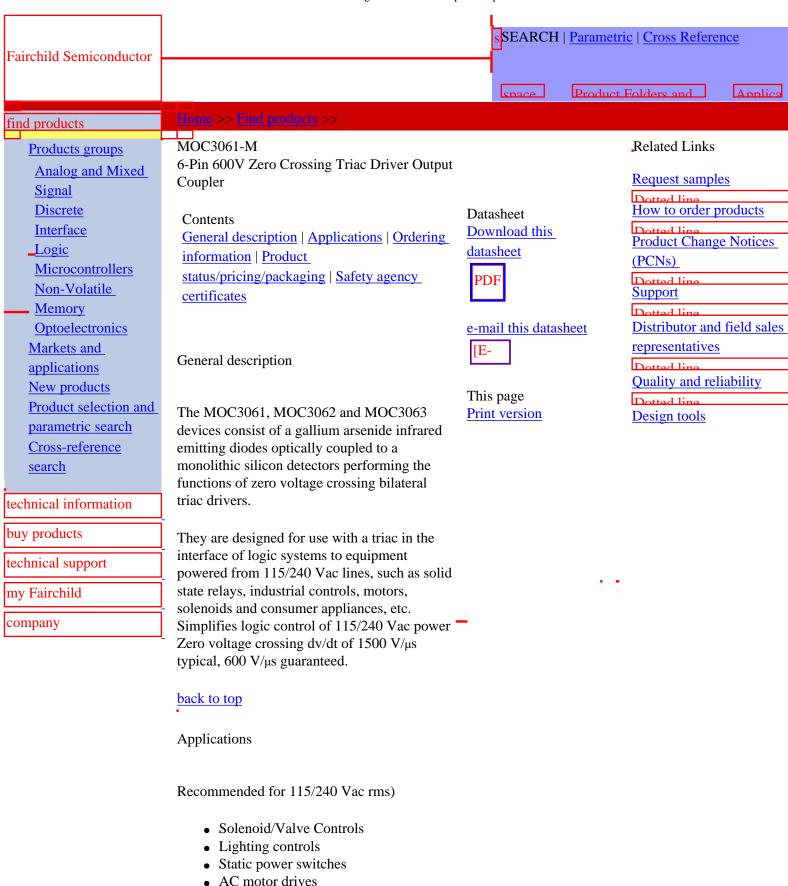
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- 2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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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
MOC3061F-M	Full Production	\$0.44	N/A	N/A	RAIL
MOC3061FR2-M	Full Production	\$0.448	DIP	6	TAPE REEL
MOC3061FR2V-M	Full Production	\$0.448	DIP	6	TAPE REEL
MOC3061FV-M	Full Production	\$0.44	N/A	N/A	RAIL
MOC3061-M	Full Production	\$0.422	N/A	N/A	RAIL
MOC3061S-M	Full Production	\$0.422	N/A	N/A	RAIL
MOC3061SR2-M	Full Production	\$0.431	DIP	6	TAPE REEL
MOC3061SR2V-M	Full Production	\$0.431	DIP	6	TAPE REEL
MOC3061SV-M	Full Production	\$0.422	DIP	6	RAIL
MOC3061T-M	Full Production	\$0.422	N/A	N/A	RAIL
MOC3061TV-M	Full Production	\$0.422	N/A	N/A	RAIL
MOC3061V-M	Full Production	\$0.422	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.

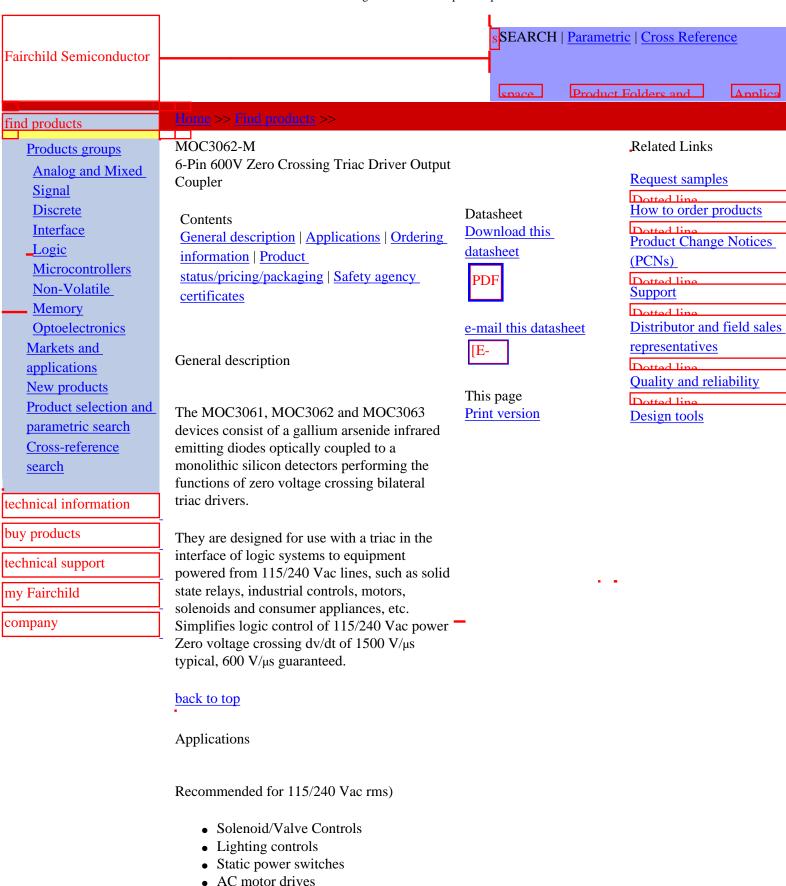
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TV	TV	0.4" Lead bend; VDE 0884	
FR2	FR2	Low profile, surface mount; T&R	
FR2V	FR2V	Low profile, surface mount; T&R VDE 0884	
SR2	SR2	Surface mount; T&R	
SR2V	SR2V	Surface mount; T&R VDE 0884	

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Product status/pricing/packaging

Product	Product status	Pricing*	Package type	Leads	Packing method
MOC3062F-M	Full Production	\$0.44	N/A	N/A	RAIL
MOC3062FR2-M	Full Production	\$0.448	DIP	6	TAPE REEL
MOC3062FR2V-M	Full Production	\$0.448	DIP	6	TAPE REEL
MOC3062FV-M	Full Production	\$0.44	N/A	N/A	RAIL
MOC3062-M	Full Production	\$0.422	N/A	N/A	RAIL
MOC3062S-M	Full Production	\$0.422	N/A	N/A	RAIL
MOC3062SR2-M	Full Production	\$0.431	DIP	6	TAPE REEL
MOC3062SR2V-M	Full Production	\$0.431	DIP	6	TAPE REEL
MOC3062SV-M	Full Production	\$0.422	DIP	6	RAIL
MOC3062T-M	Full Production	\$0.422	N/A	N/A	RAIL
MOC3062TV-M	Full Production	\$0.422	N/A	N/A	RAIL
MOC3062V-M	Full Production	\$0.422	N/A	N/A	RAIL

^{* 1,000} piece Budgetary Pricing

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<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		
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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
MOC3063F-M	Full Production	\$0.493	N/A	N/A	RAIL
MOC3063FR2-M	Full Production	\$0.50	DIP	6	TAPE REEL
MOC3063FR2V-M	Full Production	\$0.50	DIP	6	TAPE REEL
MOC3063FV-M	Full Production	\$0.493	N/A	N/A	RAIL
MOC3063-M	Full Production	\$0.475	N/A	N/A	RAIL
MOC3063S-M	Full Production	\$0.475	N/A	N/A	RAIL
MOC3063SR2-M	Full Production	\$0.484	DIP	6	TAPE REEL
MOC3063SR2V-M	Full Production	\$0.484	DIP	6	TAPE REEL
MOC3063SV-M	Full Production	\$0.475	DIP	6	RAIL
MOC3063T-M	Full Production	\$0.475	N/A	N/A	RAIL
MOC3063TV-M	Full Production	\$0.475	N/A	N/A	RAIL
MOC3063V-M	Full Production	\$0.475	N/A	N/A	RAIL

^{* 1,000} piece Budgetary Pricing

Safety agency certificates

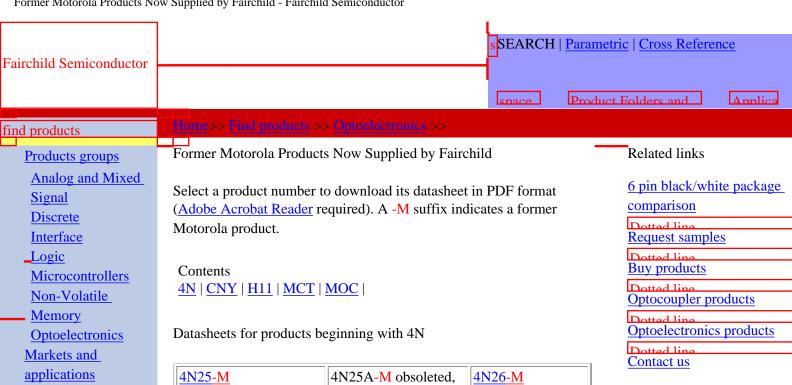
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4N25-M	4N25A-M obsoleted, no replacement	4N26-M
4N27-M	4N28-M	4N29-M replaced by 4N29
4N29A-M replaced by 4N29	4N30-M replaced by 4N30	4N31-M replaced by 4N31
4N32-M replaced by 4N32	4N33-M replaced by 4N33	4N35-M
4N36-M	4N37-M	4N38-M replaced by 4N38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

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H11AA3-M replaced by H11AA3	H11AA4-M replaced by H11AA4	H11AV1-M
H11AV1A-M	<u>H11AV2-M</u>	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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MOC208-M	MOC211-M	MOC212-M
MOC213-M	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

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MOC8204-M replaced by MOC8204	MOCD207-M	MOCD208-M
MOCD211-M	MOCD213-M	MOCD217-M
MOCD223-M		

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