MxL82207

16-bit I²C/SMBUS GPIO Expander with Integrated Level Shifters
Data Sheet

General Description

The MxL82207 is a 16-bit GPIO expander with an I²C/SMBus interface. After power-up, the MxL82207 has internal 100kΩ pull-up resistors on each I/O pin that can be individually enabled.

In addition, the GPIOs on the MxL82207 can individually be controlled and configured. As outputs, the GPIOs can be outputs that are high, low, or in three-state mode. The three-state mode feature is useful for applications where the power is removed from the remote devices, but they may still be connected to the GPIO expander.

As inputs, the internal pull-up resistors can be enabled or disabled and the input polarity can be inverted. The interrupt behavior is configurable. It can be set to trigger on a rising edge, falling edge, or both edges. The interrupt condition is cleared either when the input returns to its original state or when the current input state is read.

The MxL82207 is an enhanced version of the TCA6416. The MxL82207 is pin and software compatible with the TCA6416.

The MxL82207 is available in a 4mm × 4mm 24-pin QFN as well as 7.8mm × 4.4mm 24-pin TSSOP packages.

Applications

- Telecom, networking, and server platforms (BMC)
- GPIO expansion for embedded systems
- Industrial automation and robotics
- IoT and smart sensor devices
- System monitoring and control
- Power sequencing and control
- Human interface control (LEDs, keypads, switches)
- Test and measurement equipment
- Systems using GPIO-limited processors

Features

- 1.62V to 5.5V operating voltage
- Integrated Level Shifters
- 16 General Purpose I/Os (GPIOs)
- Maximum standby current of 1μA at +1.8V
- I²C/SMBus bus interface
  - I²C clock frequency up to 1MHz
  - Noise filter on SDA and SCL inputs
  - Up to 4 I²C Slave addresses
- Individually programmable inputs
  - Internal pull-up resistors
  - Polarity inversion
  - Individual interrupt enable
  - Rising edge and/or falling edge interrupt
  - Input filter
- Individually programmable outputs
  - Output level control
  - Output three-state control
- Open-drain active-low reset input
- Pin and software compatible with *TCA6416*
- 3kV HBM ESD protection per *JESD22-A114F*
- ±100mA latch-up performance per *JESD78B*

Revision History

Document No.	Release Date	Change Description
297DSR01	July 30, 2026	Initial final release.

Table of Contents

General Description ..... **i**
Applications ..... **i**
Features ..... **i**
Specifications **1**
Absolute Maximum Ratings 1
Thermal Information 1
Electrical Characteristics 2
DC Electrical Characteristics 2
AC Electrical Characteristics 3
Pin Information **4**
Pin Configuration 4
Pin Description 4
Block Diagram **6**
Functional Description **7**
I^2C-Bus Interface 7
I^2C-Bus Addressing 8
I^2C Read and Write 8
I^2C Command Byte 9
Interrupts 10
Register Description **11**
GPIO State Register 1 (GSR1)—Read-Only 11
GPIO State Register 2 (GSR2)—Read-Only 11
Output Control Register 1 (OCR1)—Read/Write 11
Output Control Register 2 (OCR2)—Read/Write 11
Input Polarity Inversion Register 1 (PIR1)—Read/Write 11
Input Polarity Inversion Register 2 (PIR2)—Read/Write 11
GPIO Configuration Register 1 (GCR1)—Read/Write 12
GPIO Configuration Register 2 (GCR2)—Read/Write 12
Input Internal Pull-up Enable/Disable Register 1 (PUR1)—Read/Write 12
Input Internal Pull-up Enable/Disable Register 2 (PUR2)—Read/Write 12
Input Interrupt Enable Register 1 (IER1)—Read/Write 12
Input Interrupt Enable Register 2 (IER2)—Read/Write 12
Output Three-State Control Register 1 (TSCR1)—Read/Write 12
Output Three-State Control Register 2 (TSCR2)—Read/Write 12

Input Interrupt Status Register 1 (ISR1)—Read-Only 13
Input Interrupt Status Register 2 (ISR2)—Read-Only 13
Input Rising Edge Interrupt Enable Register 1 (REIR1)—Read/Write 13
Input Rising Edge Interrupt Enable Register 2 (REIR2)—Read/Write 13
Input Falling Edge Interrupt Enable Register 1 (FEIR1)—Read/Write 13
Input Falling Edge Interrupt Enable Register 2 (FEIR2)—Read/Write 13
Input Filter Enable Register 1 (IFR1)—Read/Write 14
Input Filter Enable Register 2 (IFR2)—Read/Write 14
Mechanical Dimensions 15
TSSOP-24 15
QFN-24 16
Ordering Information 17

List of Figures

Figure 1: Pinout (Top View) 4
Figure 2: Functional Block Diagram 6
Figure 3: I^2C Start and Stop Conditions 7
Figure 4: Master Writes to Slave 7
Figure 5: Master Reads from Slave 7
Figure 6: TSSOP-24 Mechanical Dimensions 15
Figure 7: QFN-24 Mechanical Dimensions 16

List of Tables

Table 1: Absolute Maximum Ratings 1
Table 2: Thermal Information 1
Table 3: DC Electrical Characteristics 2
Table 4: AC Electrical Characteristics 3
Table 5: Pin Description 4
Table 6: I^2C Address Map 8
Table 7: I^2C Command Byte (Register Address) 9
Table 8: Interrupt Generation and Clearing 10
Table 9: Ordering Information 17

Specifications

Absolute Maximum Ratings

Important: The stresses above what is listed under the following table may cause permanent damage to the device. This is a stress rating only—functional operation of the device above what is listed under the following table or any other conditions beyond what MaxLinear recommends is not implied. Exposure to conditions above the recommended extended periods of time may affect device reliability.

Table 1: Absolute Maximum Ratings

Parameter	Min	Max	Units
Power Supply Voltage	-	6	V
Supply Current	-	160	mA
Ground Current	-	200	mA
External Current Limit of each GPIO	-	25	mA
Total Current Limit for GPIO[15:8] and GPIO[7:0]	-	100	mA
Total Current Limit for GPIO[15:0]	-	200	mA
Total Supply Current sourced by all GPIOs	-	160	mA
Operating Temperature	–40	+85	°C
Storage Temperature	–65	+150	°C
Power Dissipation	-	200	mW

Thermal Information

Table 2: Thermal Information

Symbol	Thermal Metric	Typical		Unit
		QFN-24	TSSOP-24	
$\theta_{JC(top)}$	Junction-to-Case Top Thermal Resistance	64	38	°C/W
$\theta_{JC(bottom)}$	Junction-to-Case Bottom Thermal Resistance	26	61	
θ_{JB}	Junction-to-Board Thermal Resistance	32	60	
θ_{JA}	Junction-to-Ambient Thermal Resistance	51	83	
Ψ_{JT}	Junction-to-Case Top Thermal Characterization	9	2	
Ψ_{JB}	Junction-to-Board Thermal Characterization	31	56	

Electrical Characteristics

DC Electrical Characteristics

DC Electrical characteristics at V_{cc} = 1.62V to 5.5V, T_A = –40°C to +85°C, unless otherwise specified.

Table 3: DC Electrical Characteristics

Symbol	Parameter	Limits 1.8V ± 10% Min	Limits 1.8V ± 10% Max	Limits 2.5V ± 10% Min	Limits 2.5V ± 10% Max	Limits 3.3V ± 10% Min	Limits 3.3V ± 10% Max	Limits 5V ± 10% Min	Limits 5V ± 10% Max	Units	Conditions
V_{IL}	Input Low Voltage	–0.3	0.3*VCC	–0.3	0.3*VCC	–0.3	0.3*VCC	–0.3	0.3*VCC	V	Note 1
V_{IL}	Input Low Voltage	–0.3	0.2	–0.3	0.5	–0.3	0.8	–0.3	1.1	V	Note 2
V_{IH}	Input High Voltage	0.7*VCC	VCC	0.7*VCC	VCC	0.7*VCC	VCC	0.7*VCC	VCC	V	Note 1
V_{IH}	Input High Voltage	1.4	5.5	1.8	5.5	2.0	5.5	2.3	5.5	V	Note 2
V_{OL}	Output Low Voltage	0	0.4	0	0.4	0	0.4	0	0.4	V	I_{OL} = 3mA Note 3
V_{OL}	Output Low Voltage	0	0.5	0	0.5	0	0.5	0	0.2	V	I_{OL} = 8mA Note 4
V_{OL}	Output Low Voltage	0	0.4	0	0.4	0	0.4	0	0.4	V	I_{OL} = 1.5mA I_{OL} = 4mA I_{OL} = 6mA Note 5
V_{OH}	Output High Voltage	1.2	-	1.8	-	2.6	-	4.1	-	V	I_{OH} = –8mA Note 4
I_{IL}	Input Low Leakage Current	-	±10	-	±10	-	±10	-	±10	µA	-
I_{IH}	Input High Leakage Current	-	±10	-	±10	-	±10	-	±10	µA	-
I_{CC}	Power Supply Current	-	50	-	100	-	200	-	400	µA	Note 6
I_{CC}	Power Supply Current	-	150	-	250	-	500	-	1000	µA	Note 7
I_{CCS}	Standby Current	-	1	-	2	-	5	-	7	µA	Note 8
C_{IN}	Input Pin Capacitance	-	5	-	5	-	5	-	5	pF	-
R_{GPIO}	GPIO pull-up Resistance	60	140	60	140	60	140	60	140	kΩ	100kΩ ±40%
$R_{RESET\#}$	Pull-up Resistance	35	85	35	85	35	85	35	85	kΩ	60kΩ ±40%

1. For I^2C input signals (SDA, SCL).

2. For GPIOs and A0 signals.

3. For I^2C output signal SDA.

4. For GPIOs.

5. For IRQ# signal

6. Test 1: SCL frequency is 1MHz with internal pull-ups disabled. All GPIOs are configured as inputs. All inputs are steady at VCC or GND. Outputs are floating or in the tri-state mode.

7. Test 2: SCL frequency is 1MHz with internal pull-ups enabled. All GPIOs are configured as inputs. All inputs are steady at VCC or GND. Outputs are floating or in the tri-state mode.

8. Test 3: All inputs are steady at VCC or GND to minimize standby current. If internal pull-up is enabled, input voltage level should be the same as VCC. All GPIOs are configured as inputs. SCL and SDA are at VCC. Outputs are left floating or in tri-state mode.

AC Electrical Characteristics

AC Electrical characteristics at V_{cc} = 1.62V to 5.5V, T_A = –40°C to +85°C, unless otherwise specified.

Table 4: AC Electrical Characteristics

Symbol	Parameter	Standard Mode I^2C-Bus		Fast Mode I^2C-Bus		Fast Mode Plus I^2C-Bus		Units
		Min	Max	Min	Max	Min	Max	
f_{SCL}	Operating Frequency	0	100	0	400	0	1000	kHz
T_{BUF}	Bus Free Time between STOP and START	4.7	-	1.3	-	0.5	-	µs
$T_{HD;STA}$	START Condition Hold Time	4.0	-	0.6	-	0.26	-	µs
$T_{SU;STA}$	START Condition Setup Time	4.7	-	0.6	-	0.26	-	µs
$T_{HD;DAT}$	Data Hold Time	0	-	0	-	0	-	ns
$T_{VD;ACK}$	Data Valid Acknowledge	-	0.6	-	0.6	-	0.45	µs
$T_{VD;DAT}$	SCL Low to Data Out Valid	-	0.6	-	0.6	-	0.45	µs
$T_{SU;DAT}$	Data Setup Time	250	-	100	-	50	-	ns
T_{LOW}	Clock Low Period	4.7	-	1.3	-	0.5	-	µs
T_{HIGH}	Clock High period	4.0	-	0.6	-	0.26	-	µs
T_F	Clock/Data Fall Time	-	300	-	300	-	120	ns
T_R	Clock/Data Rise Time	-	1000	-	300	-	120	ns
T_{SP}	Pulse Width of Spikes Tolerance	50	-	50	-	-	50	ns
T_{D1}	I^2C-Bus GPIO Output Valid	-	0.2	-	0.2	-	0.4	µs
T_{D4}	I^2C Input Pin Interrupt Valid	-	4	-	4	-	4	µs
T_{D5}	I^2C Input Pin Interrupt Clear	-	4	-	4	-	4	µs
T_{D15}	SCL Delay after Reset	3	-	3	-	3	-	µs

Pin Information

Pin Configuration

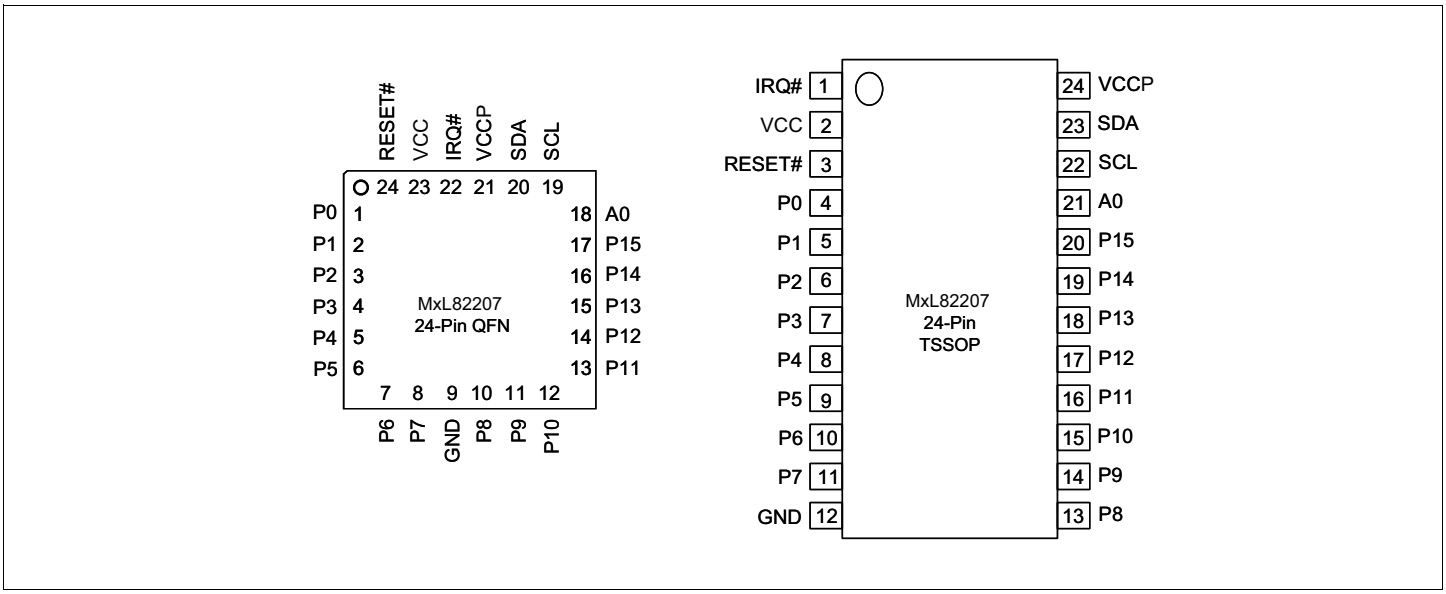


Figure 1: Pinout (Top View)

Pin Description

Table 5: Pin Description

Pin Name	QFN-24 PIN#	TSSOP-24 PIN#	Type	Description
I²C Interface				
SDA	20	23	I/O	I²C-bus data input/output (open-drain).
SCL	19	22	I	I²C-bus serial input clock.
IRQ#	22	1	OD	Interrupt output (open-drain, active low).
A0	18	21	I	These pins select the I²C slave address. See Table 6 on page 8.
RESET#	24	3	I	Reset (active low) - A longer than 40ns low pulse on this pin resets the internal registers and all GPIOs are configured as inputs.
GPIOs				
P0	1	4	I/O	General purpose I/Os P0-P7. All GPIOs are configured as inputs upon power-up or after a reset.
P1	2	5	I/O	
P2	3	6	I/O	
P3	4	7	I/O	
P4	5	8	I/O	
P5	6	9	I/O	
P6	7	10	I/O	
P7	8	11	I/O	

Table 5: Pin Description

Pin Name	QFN-24 PIN#	TSSOP-24 PIN#	Type	Description
P8	10	13	I/O	General purpose I/O P8-P15. All GPIOs are configured as inputs upon power-up or after a reset.
P9	11	14	I/O	
P10	12	15	I/O	
P11	13	16	I/O	
P12	14	17	I/O	
P13	15	18	I/O	
P14	16	19	I/O	
P15	17	20	I/O	
Ancillary Signals				
VCCP	21	24	Pwr	1.62V to 5.5V VCC supply voltage for GPIOs.
VCC	23	2	Pwr	1.62V to 5.5V supply for I^2C-bus interface.
GND	9	12	Pwr	Power supply common, ground.
GND	Center Pad	-	Pwr	The exposed pad at the bottom surface of the package is designed for thermal performance. Use of a center pad on the PCB is strongly recommended for thermal conductivity as well as to provide mechanical stability of the package on the PCB. The center pad is recommended to be solder masked defined with opening size less than or equal to the exposed thermal pad on the package bottom to prevent solder bridging to the outer leads of the device. Thermal vias must be connected to GND plane as the thermal pad of package is at GND potential.

Note: Pin type: I = Input, O = Output, I/O = Input/output, OD = Output Open Drain.

Block Diagram

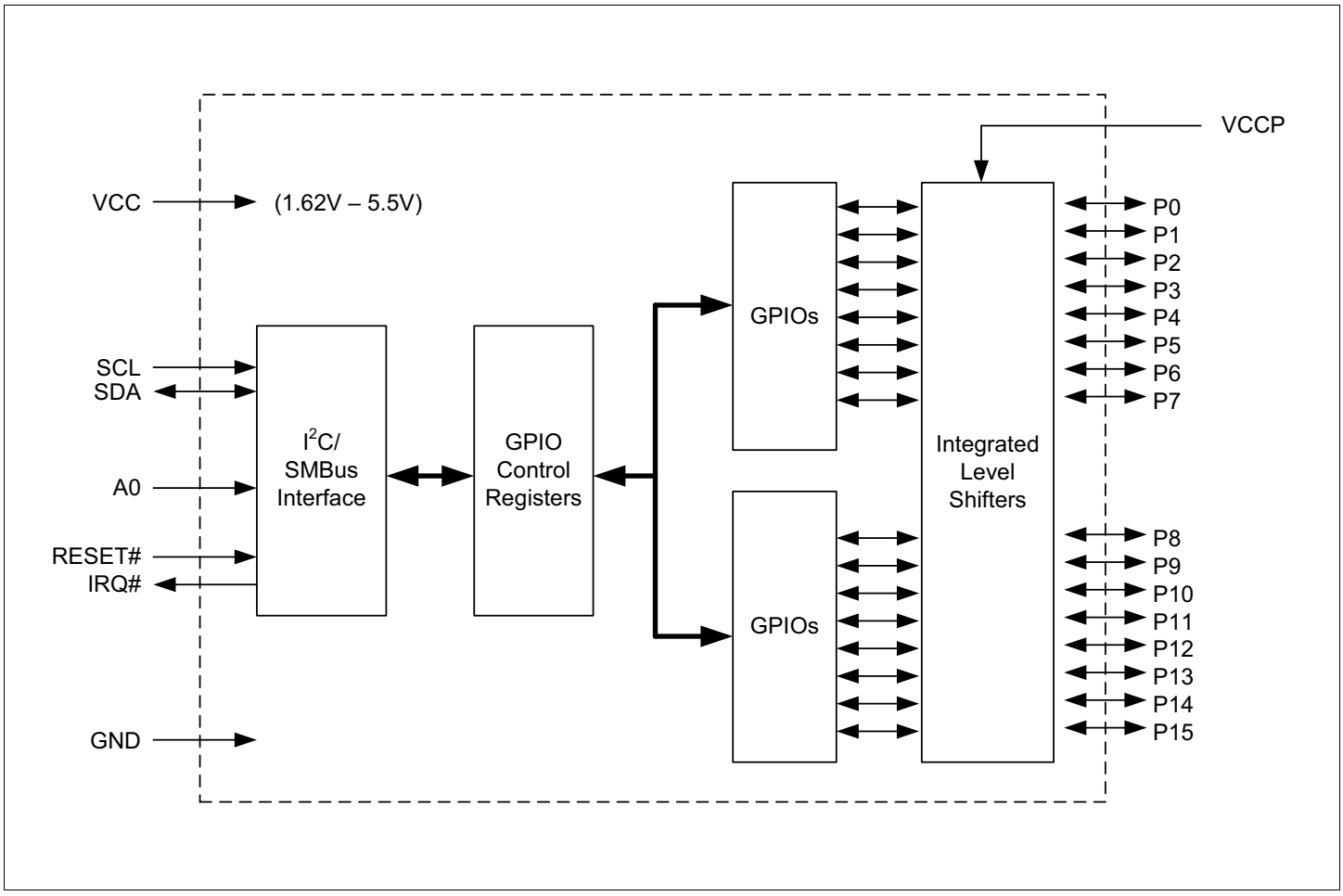


Figure 2: Functional Block Diagram

Functional Description

I²C-Bus Interface

The I2C-bus interface complies with the standard-, fast-, and fast mode plus specifications. It uses two lines: serial data (SDA) and serial clock (SCL). In standard mode, both signals operate up to 100kHz, while fast mode supports speeds up to 400kHz and fast mode plus extends operation up to 1MHz (1000kHz).

The first byte sent by an I²C-bus master contains a start bit (SDA transition from *high* to *low* when SCL is *high*), 7-bit slave address and whether it is a read or write transaction. The next byte is the sub-address that contains the address of the register to access. The MxL82207 device responds to each write with an acknowledge (SDA driven *low* by MxL82207 for one clock cycle when SCL is *high*). The last byte sent by an I²C-bus master contains a stop bit (SDA transition from *low* to *high* when SCL is *high*). See the following figures. For complete details, refer to the I²C-bus specifications.

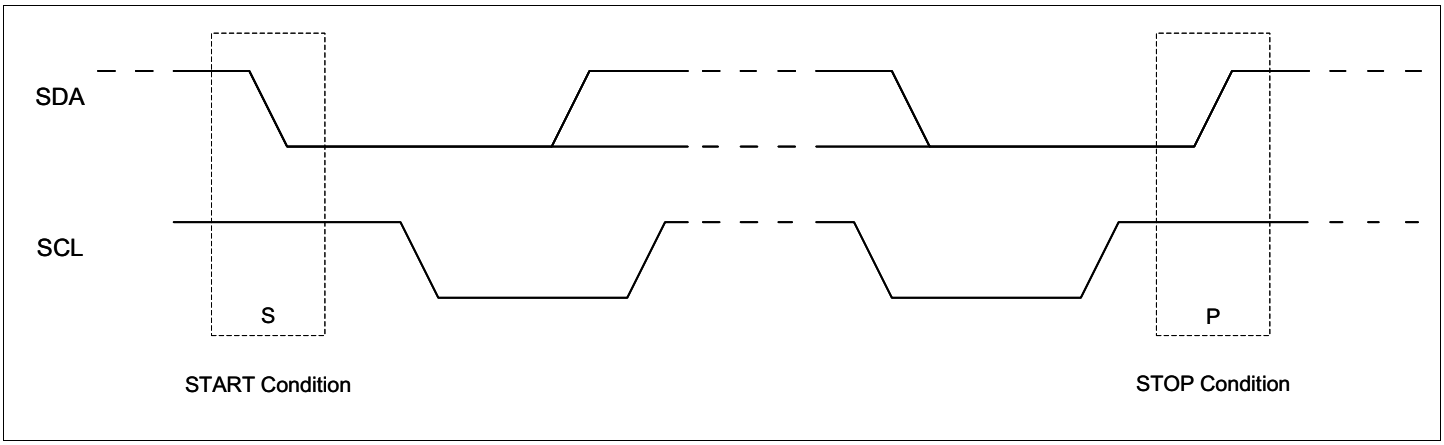


Figure 3: I²C Start and Stop Conditions

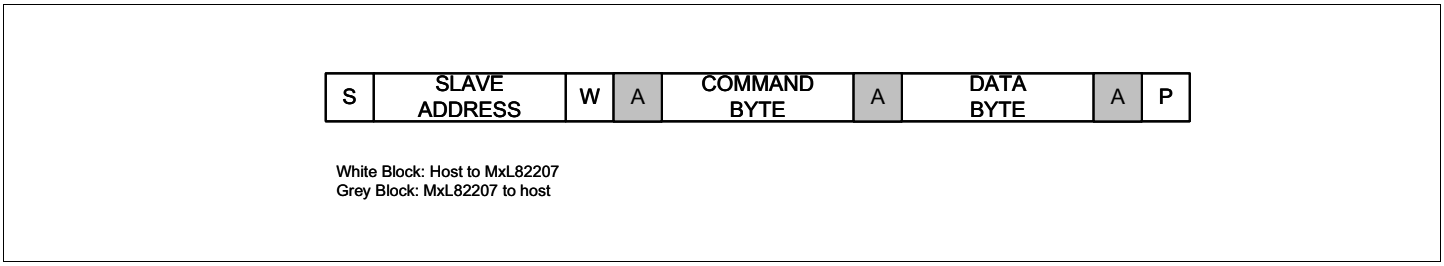


Figure 4: Master Writes to Slave

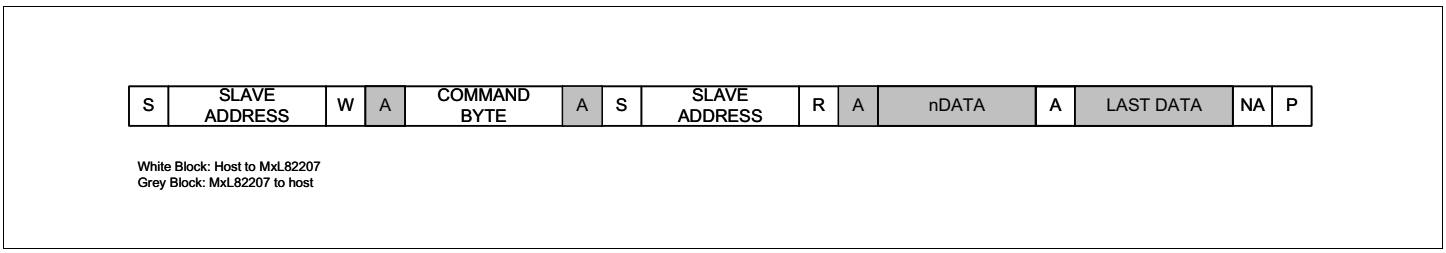


Figure 5: Master Reads from Slave

I²C-Bus Addressing

There can be different devices on the I²C-bus. To distinguish itself from the other devices on the I²C-bus, the MxL82207 has up to 4 I²C slave addresses using the A0 address line. The following table lists the different addresses that can be selected.

Table 6: I²C Address Map

A0	I²C Address
GND	0x40 (0100 000X)
VCC	0x42 (0100 001X)
SCL	0x50 (0101 000X)
SDA	0x52 (0101 001X)

I²C Read and Write

A read or write transaction is determined by bit-0 of the slave address. If bit-0 is *0*, then it is a write transaction. If bit-0 is *1*, then it is a read transaction.

I²C Command Byte

An I²C command byte is sent by the I²C master following the slave address. The command byte indicates the address offset of the register that is accessed. The following table lists the command bytes for each register.

Table 7: I²C Command Byte (Register Address)

Command Byte	Register Name Description	Read/Write	Default Values
0x00	GSR1–GPIO State for P0-P7	Read-Only	0xXX
0x01	GSR2–GPIO State for P8-P15	Read-Only	0xXX
0x02	OCR1–Output Control for P0-P7	Read/Write	0xFF
0x03	OCR2–Output Control for P8-P15	Read/Write	0xFF
0x04	PIR1–Input Polarity Inversion for P0-P7	Read/Write	0x00
0x05	PIR2–Input Polarity Inversion for P8-P15	Read/Write	0x00
0x06	GCR1–GPIO Configuration for P0-P7	Read/Write	0xFF
0x07	GCR2–GPIO Configuration for P8-P15	Read/Write	0xFF
0x08	PUR1–Input Internal Pull-up Resistor Enable/Disable for P0-P7	Read/Write	0x00
0x09	PUR2–Input Internal Pull-up Resistor Enable/Disable for P8-P15	Read/Write	0x00
0x0A	IER1–Input Interrupt Enable for P0-P7	Read/Write	0x00
0x0B	IER2–Input Interrupt Enable for P8-P15	Read/Write	0x00
0x0C	TSCR1–Output Three-State Control for P0-P7	Read/Write	0x00
0x0D	TSCR2–Output Three-State Control for P8-P15	Read/Write	0x00
0x0E	ISR1–Input Interrupt Status for P0-P7	Read	0x00
0x0F	ISR2–Input Interrupt Status for P8-P15	Read	0x00
0x10	REIR1–Input Rising Edge Interrupt Enable for P0-P7	Read/Write	0x00
0x11	REIR2–Input Rising Edge Interrupt Enable for P8-P15	Read/Write	0x00
0x12	FEIR1–Input Falling Edge Interrupt Enable for P0-P7	Read/Write	0x00
0x13	FEIR2–Input Falling Edge Interrupt Enable for P8-P15	Read/Write	0x00
0x14	IFR1–Input Filter Enable/Disable for P0-P7	Read/Write	0xFF
0x15	IFR2–Input Filter Enable/Disable for P8-P15	Read/Write	0xFF

Interrupts

The following table lists the interrupt behavior of the different register settings for the MxL82207 device.

Table 8: Interrupt Generation and Clearing

GCR Bit	IER Bit	REIR Bit	FEIR Bit	IFR Bit	Interrupt Generated By	Interrupt Cleared By
1	0	X	X	X	No interrupts enabled (default).	N/A.
1	1	0	0	0	A rising or falling edge on the input.	Reading the GSR register or if the input changes back to its previous state (state of input during last read to GSR).
				1	A rising or falling edge on the input and remains in the new state for more than 1075ns.	
1	1	1	0	0	A rising edge on the input.	Reading the GSR register.
				1	A rising edge on the input and remains high for more than 1075ns.	
1	1	0	1	0	A falling edge on the input.	Reading the GSR register.
				1	A falling edge on the input and remains low for more than 1075ns.	
1	1	1	1	0	A rising or falling edge on the input.	Reading the GSR register.
				1	A rising or falling edge on the input and remains in the new state for more than 1075ns.	
0	x	x	x	x	No interrupts in output mode.	N/A

Register Description

GPIO State Register 1 (GSR1)—Read-Only

The status of P7–P0 can be read via this register. A read shows the current state of these pins (or the inverted state of these pins if enabled via the PIR register). Reading this register clears an input interrupt (For complete details, see Table 8 on page 10). Reading this register also returns the last value written to the OCR register for any pins that are configured as outputs (note that this is not the same as the state of the actual output pin since the output pin can be in three-state mode). A write to this register has no effect. The MSB of this register corresponds with P7 and the LSB of this register corresponds with P0.

GPIO State Register 2 (GSR2)—Read-Only

The status of P15–P8 can be read via this register. A read shows the current state of these pins (or the inverted state of these pins if enabled via the PIR register). Reading this register clears an input interrupt (For complete details, see Table 8 on page 10). Reading this register also returns the last value written to the OCR register for any pins that are configured as outputs (note that this is not the same as the state of the actual output pin since the output pin can be in three-state mode). A write to this register has no effect. The MSB of this register corresponds with P15 and the LSB of this register corresponds with P8.

Output Control Register 1 (OCR1)—Read/Write

When P7–P0 are defined as outputs, they can be controlled by writing to this register. Reading this register returns the last value written to it, however, this value may not be the actual state of the output pin since these pins can be in three-state mode. The MSB of this register corresponds with P7 and the LSB of this register corresponds with P0.

Output Control Register 2 (OCR2)—Read/Write

When P15–P8 are defined as outputs, they can be controlled by writing to this register. Reading this register returns the last value written to it, however, this value may not be the actual state of the output pin since these pins can be in three-state mode. The MSB of this register corresponds with P15 and the LSB of this register corresponds with P8.

Input Polarity Inversion Register 1 (PIR1)—Read/Write

When P7–P0 are defined as inputs, this register inverts the polarity of the input value read from the input port register. If the corresponding bit in this register is set to *1*, the value of this bit in the GSR register is the inverted value of the input pin. If the corresponding bit in this register is set to *0*, the value of this bit in the GSR register is the actual value of the input pin. The MSB of this register corresponds with P7 and the LSB of this register corresponds with P0.

Input Polarity Inversion Register 2 (PIR2)—Read/Write

When P15–P8 are defined as inputs, this register inverts the polarity of the input value read from the input port register. If the corresponding bit in this register is set to *1*, the value of this bit in the GSR register is the inverted value of the input pin. If the corresponding bit in this register is set to *0*, the value of this bit in the GSR register is the actual value of the input pin. The MSB of this register corresponds with P15 and the LSB of this register corresponds with P8.

GPIO Configuration Register 1 (GCR1)—Read/Write

This register configures the GPIOs as inputs or outputs. After power-up, the GPIOs are inputs. Setting these bits to *0* enables the GPIOs as outputs. Setting these bits to *1* enables the GPIOs as inputs. The MSB of this register corresponds with P7 and the LSB of this register corresponds with P0.

GPIO Configuration Register 2 (GCR2)—Read/Write

This register configures the GPIOs as inputs or outputs. After power-up, the GPIOs are inputs. Setting these bits to *0* enables the GPIOs as outputs. Setting these bits to *1* enables the GPIOs as inputs. The MSB of this register corresponds with P15 and the LSB of this register corresponds with P8.

Input Internal Pull-up Enable/Disable Register 1 (PUR1)—Read/Write

This register enables/disables the internal pull-up resistors for an input. Writing a *1* to these bits enables the internal pull-up resistors. Writing a *0* to these bits disables the internal pull-up resistors. The MSB of this register corresponds with P7 and the LSB of this register corresponds with P0.

Input Internal Pull-up Enable/Disable Register 2 (PUR2)—Read/Write

This register enables/disables the internal pull-up resistors for an input. Writing a *1* to these bits enables the internal pull-up resistors. Writing a *0* to these bits disables the internal pull-up resistors. The MSB of this register corresponds with P15 and the LSB of this register corresponds with P8.

Input Interrupt Enable Register 1 (IER1)—Read/Write

This register enables/disables the interrupts for an input. After power-up, the interrupts are disabled. Writing a *1* to these bits enables the interrupt for the corresponding input pins. For complete details of the interrupt behavior for various register settings, see Table 8 on page 10. No interrupts are generated for outputs when GCR bit is *0*. The MSB of this register corresponds with P7 and the LSB of this register corresponds with P0.

Input Interrupt Enable Register 2 (IER2)—Read/Write

This register enables/disables the interrupts for an input. After power-up, the interrupts are disabled. Writing a *1* to these bits enables the interrupt for the corresponding input pins. For complete details of the interrupt behavior for various register settings, see Table 8 on page 10. No interrupts are generated for outputs when GCR bit is *0*. The MSB of this register corresponds with P15 and the LSB of this register corresponds with P8.

Output Three-State Control Register 1 (TSCR1)—Read/Write

This register can enable/disable the three-state mode of an output. Writing a *1* to these bits enables the three-state mode for the corresponding output pins. The MSB of this register corresponds with P7 and the LSB of this register corresponds with P0.

Output Three-State Control Register 2 (TSCR2)—Read/Write

This register can enable/disable the three-state mode of an output. Writing a *1* to these bits enables the three-state mode for the corresponding output pins. The MSB of this register corresponds with P15 and the LSB of this register corresponds with P8.

Input Interrupt Status Register 1 (ISR1)—Read-Only

This register reports the input pins that have generated an interrupt. For complete details of the interrupt behavior for various register settings, see Table 8 on page 10. The MSB of this register corresponds with P7 and the LSB of this register corresponds with P0.

Input Interrupt Status Register 2 (ISR2)—Read-Only

This register reports the input pins that have generated an interrupt. For complete details of the interrupt behavior for various register settings, see Table 8 on page 10. The MSB of this register corresponds with P15 and the LSB of this register corresponds with P8.

Input Rising Edge Interrupt Enable Register 1 (REIR1)—Read/Write

Writing a *1* to these bits enables the corresponding input to generate an interrupt on the rising edge. For complete details of the interrupt behavior for various register settings, see Table 8 on page 10. The MSB of this register corresponds with P7 and the LSB of this register corresponds with P0.

Input Rising Edge Interrupt Enable Register 2 (REIR2)—Read/Write

Writing a *1* to these bits enables the corresponding input to generate an interrupt on the rising edge. For complete details of the interrupt behavior for various register settings, see Table 8 on page 10. The MSB of this register corresponds with P15 and the LSB of this register corresponds with P8.

Input Falling Edge Interrupt Enable Register 1 (FEIR1)—Read/Write

Writing a *1* to these bits disables the level-sensitive interrupt logic and enables the falling edge interrupt logic if the corresponding GPIO pin is configured as an input. For complete details of the interrupt behavior for various register settings, see Table 8 on page 10. The MSB of this register corresponds with P7 and the LSB of this register corresponds with P0.

Input Falling Edge Interrupt Enable Register 2 (FEIR2)—Read/Write

Writing a *1* to these bits disables the level-sensitive interrupt logic and enables the falling edge interrupt logic if the corresponding GPIO pin is configured as an input. For complete details of the interrupt behavior for various register settings, see Table 8 on page 10. The MSB of this register corresponds with P15 and the LSB of this register corresponds with P8.

Input Filter Enable Register 1 (IFR1)—Read/Write

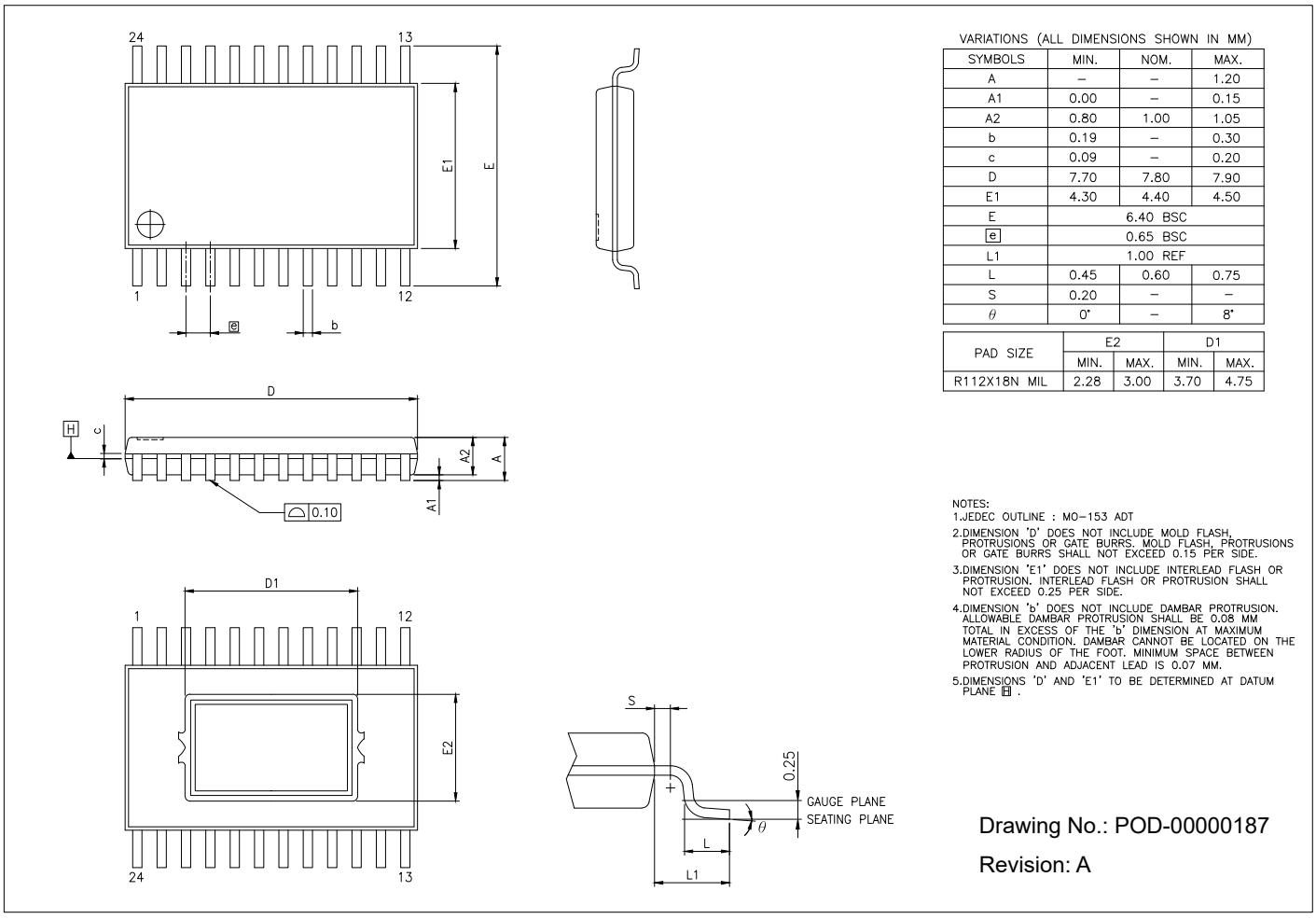
By default, the input filters are enabled (IFR = 0xFF). When the input filters are enabled, any pulse that is greater than 1075ns generates an interrupt (if enabled). Pulses that are less than 190ns are filtered and do not generate an interrupt. Pulses in between this range may or may not generate an interrupt. Writing a *0* to these bits disables the input filter for the corresponding inputs. With the input filters disabled, any change on the inputs generates an interrupt (if enabled). For complete details of the interrupt behavior for various register settings, see Table 8 on page 10. The MSB of this register corresponds with P7 and the LSB of this register corresponds with P0.

Input Filter Enable Register 2 (IFR2)—Read/Write

By default, the input filters are enabled (IFR = 0xFF). When the input filters are enabled, any pulse that is greater than 1075ns generates an interrupt (if enabled). Pulses that are less than 190ns are filtered and do not generate an interrupt. Pulses in between this range may or may not generate an interrupt. Writing a *0* to these bits disables the input filter for the corresponding inputs. With the input filters disabled, any change on the inputs generates an interrupt (if enabled). For complete details of the interrupt behavior for various register settings, see Table 8 on page 10. The MSB of this register corresponds with P15 and the LSB of this register corresponds with P8.

Mechanical Dimensions

TSSOP-24



VARIATIONS (ALL DIMENSIONS SHOWN IN MM)

SYMBOLS	MIN.	NOM.	MAX.
A	–	–	1.20
A1	0.00	–	0.15
A2	0.80	1.00	1.05
b	0.19	–	0.30
c	0.09	–	0.20
D	7.70	7.80	7.90
E1	4.30	4.40	4.50
E	6.40 BSC		
e	0.65 BSC		
L1	1.00 REF		
L	0.45	0.60	0.75
S	0.20	–	–
θ	0°	–	8°

PAD SIZE	E2		D1	
	MIN.	MAX.	MIN.	MAX.
R112X18N MIL	2.28	3.00	3.70	4.75

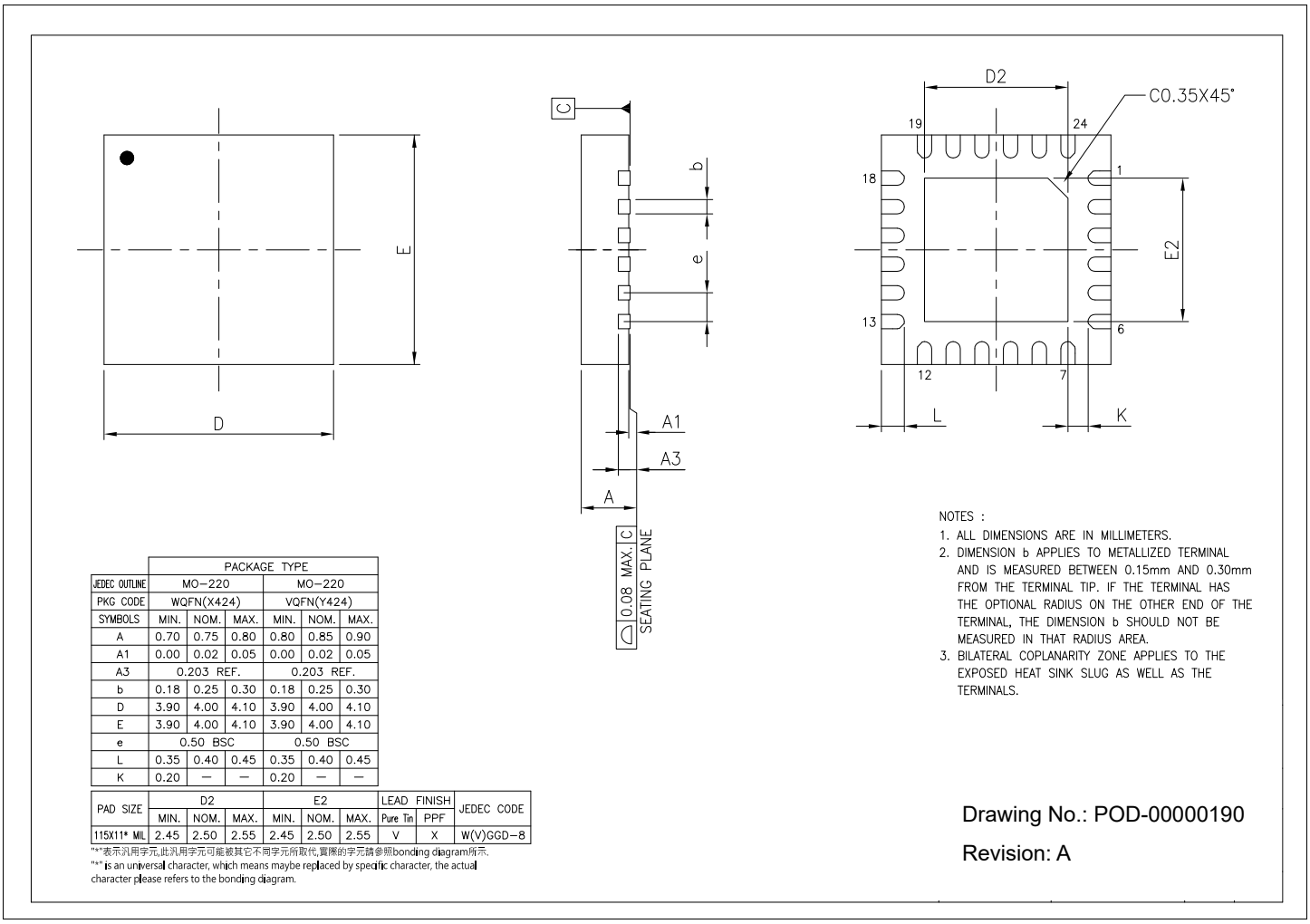
NOTES:
1. JEDEC OUTLINE : MO-153 ADT
2. DIMENSION 'D' DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. MOLD FLASH, PROTRUSIONS OR GATE BURRS SHALL NOT EXCEED 0.15 PER SIDE.
3. DIMENSION 'E1' DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION. INTERLEAD FLASH OR PROTRUSION SHALL NOT EXCEED 0.25 PER SIDE.
4. DIMENSION 'b' DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.08 MM TOTAL IN EXCESS OF THE 'b' DIMENSION AT MAXIMUM MATERIAL CONDITION. DAMBAR CANNOT BE LOCATED ON THE LOWER RADIUS OF THE FOOT. MINIMUM SPACE BETWEEN PROTRUSION AND ADJACENT LEAD IS 0.07 MM.
5. DIMENSIONS 'D' AND 'E1' TO BE DETERMINED AT DATUM PLANE H .

Drawing No.: POD-00000187

Revision: A

Figure 6: TSSOP-24 Mechanical Dimensions

QFN-24



	PACKAGE TYPE					
JEDEC OUTLINE	MO-220			MO-220		
PKG CODE	WQFN(X424)			VQFN(Y424)		
SYMBOLS	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.70	0.75	0.80	0.80	0.85	0.90
A1	0.00	0.02	0.05	0.00	0.02	0.05
A3	0.203 REF.			0.203 REF.		
b	0.18	0.25	0.30	0.18	0.25	0.30
D	3.90	4.00	4.10	3.90	4.00	4.10
E	3.90	4.00	4.10	3.90	4.00	4.10
e	0.50 BSC			0.50 BSC		
L	0.35	0.40	0.45	0.35	0.40	0.45
K	0.20	—	—	0.20	—	—

PAD SIZE	D2			E2			LEAD FINISH		JEDEC CODE
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.	Pure Tin	PPF	
115X11* MIL	2.45	2.50	2.55	2.45	2.50	2.55	V	X	W(V)GGD-8

"*"表示汎用字元,此汎用字元可能被其它不同字元所取代,實際的字元請參照bonding diagram所示.
"*" is an universal character, which means maybe replaced by specific character, the actual character please refers to the bonding diagram.

NOTES :
1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DIMENSION b APPLIES TO METALLIZED TERMINAL AND IS MEASURED BETWEEN 0.15mm AND 0.30mm FROM THE TERMINAL TIP. IF THE TERMINAL HAS THE OPTIONAL RADIUS ON THE OTHER END OF THE TERMINAL, THE DIMENSION b SHOULD NOT BE MEASURED IN THAT RADIUS AREA.
3. BILATERAL COPLANARITY ZONE APPLIES TO THE EXPOSED HEAT SINK SLUG AS WELL AS THE TERMINALS.

Drawing No.: POD-00000190

Revision: A

Figure 7: QFN-24 Mechanical Dimensions

Ordering Information

Table 9: Ordering Information

Ordering Part Number	Package	Number of GPIOs	Operating Temperature Range	Package Method	Lead-Free
MXL82207I-AQB-R	QFN-24	16	–40°C to 85°C	Tape and Reel	Yes
MXL82207I-AGA-R	TSSOP-24	16	–40°C to 85°C	Tape and Reel	Yes
MXL82207I-AGA-EVK-1	MxL82207 Evaluation Kit				

Note:

- For more information about part numbers, as well as the most up-to-date ordering information and additional information on environmental rating, go to www.maxlinear.com/MxL82207.
- For more information about the EVK, refer to the *MxL82206 and MxL82207 User Manual* (045UM00).

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