

IS280GR / IS280-4GR



DESCRIPTION

The IS280GR single channel and IS280-4GR quad channel optocouplers each channel consist of two infrared emitting diodes in reverse parallel connection optically coupled to an NPN silicon photo transistor.

These devices belong to Isocom Compact Range of Optocouplers.

FEATURES

- Half Pitch 1.27mm
- High AC Isolation voltage 3750V_{RMS}
- Wide Operating Temperature Range -55°C to 110°C
- Pb Free and RoHS Compliant
- UL Approval E91231
IS280GR : Model "AHPGR"
IS280-4GR : Model "AHP4GR"

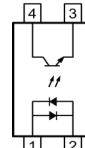
APPLICATIONS

- Hybrid Substrates with High Density Mounting
- Industrial System Controllers
- Measuring Instruments
- System Appliances

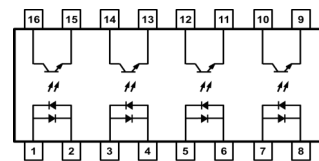
ORDER INFORMATION

- Available in Tape and Reel
IS280GR : 3000pcs per reel
IS280-4GR : 2000pcs per reel

IS280GR



IS280-4GR



IS280GR	1	Anode / Cathode	3	Emitter
	2	Cathode / Anode	4	Collector
IS280-4GR	1, 3, 5, 7	Anode / Cathode	9, 11, 13, 15	Emitter
	2, 4, 6, 8	Cathode / Anode	10, 12, 14, 16	Collector

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Stresses exceeding the absolute maximum ratings can cause permanent damage to the device. Exposure to absolute maximum ratings for long periods of time can adversely affect reliability.

Input

Forward Current	±50mA
Power dissipation	65mW

Output

Collector to Emitter Voltage BV _{CEO}	80V
Emitter to Collector Voltage BV _{ECO}	7V
Collector Current	50mA
Junction Temperature	125°C
Power Dissipation	IS280GR 150mW IS280-4GR 100mW

Total Package

Isolation Voltage	3750V _{RMS}
Total Power Dissipation	IS280GR 200mW IS280-4GR 170mW
Operating Temperature	-55 to 110 °C
Storage Temperature	-55 to 150 °C
Lead Soldering Temperature (10s)	260°C

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IS280GR / IS280-4GR

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

INPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward Voltage	V_F	$I_F = \pm 20\text{mA}$		1.2	1.4	V
Terminal Capacitance	C_{IN}	$V = 0\text{V}, f = 1\text{KHz}$		60		pF

OUTPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector-Emitter Breakdown Voltage	BV_{CEO}	$I_C = 0.1\text{mA}, I_F = 0\text{mA}$	80			V
Emitter-Collector Breakdown Voltage	BV_{ECO}	$I_E = 10\mu\text{A}, I_F = 0\text{mA}$	7			V
Collector-Emitter Dark Current	I_{CEO}	$V_{CE} = 20\text{V}, I_F = 0\text{mA}$			100	nA

COUPLED

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Current transfer ratio	CTR	IS280GR $I_F = \pm 5\text{mA}, V_{CE} = 5\text{V}$ IS280-4GR $I_F = \pm 1\text{mA}, V_{CE} = 5\text{V}$	100		300	%
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_F = \pm 8\text{mA}, I_C = 2.4\text{mA}$			0.4	V
Floating Capacitance	C_f	$V_F = 0\text{V}, f = 1\text{MHz}$		0.8	1	pF
Output Rise Time	t_r	$V_{CE} = 2\text{V}$ $I_C = \pm 2\text{mA}$ $R_L = 100\Omega$		3	18	μs
Output Fall Time	t_f			4	18	

ISOLATION

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Isolation Voltage	V_{ISO}	R.H. = 40% to 60%, $t = 1\text{min}$ Note 1	3750			V_{RMS}
Input - Output Resistance	R_{I-O}	$V_{I-O} = 500\text{VDC}$ R.H. = 40% to 60% Note 1	5×10^{10}	1×10^{11}		Ω

Note 1 : Measured with input leads shorted together and output leads shorted together.

IS280GR / IS280-4GR

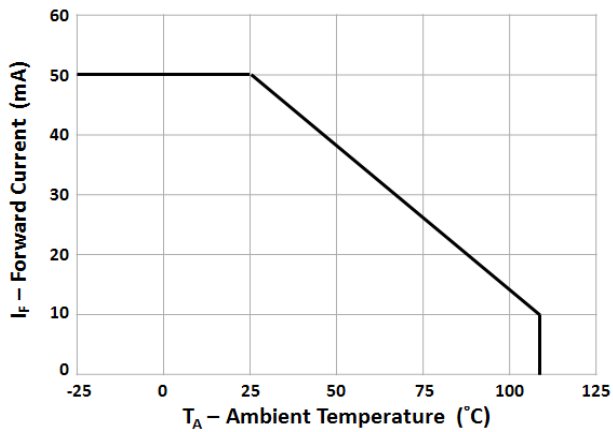


Fig 1 Forward Current vs Ambient Temperature

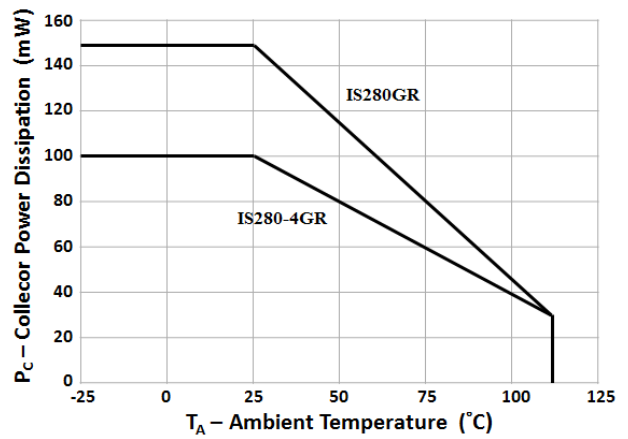


Fig 2 Output Power Dissipation vs Ambient Temperature

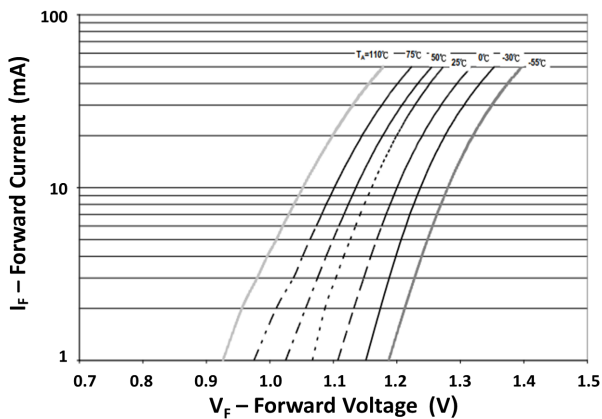


Fig 3 Forward Current vs Forward Voltage

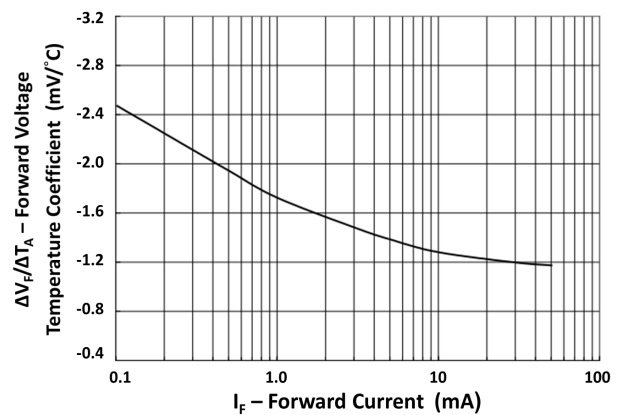


Fig 4 Forward Voltage Temperature Coefficient vs Forward Current

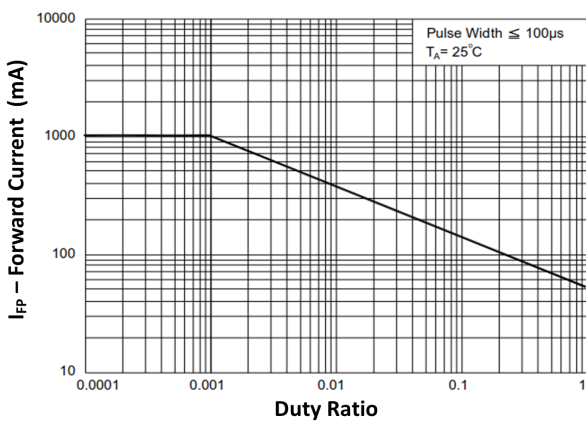


Fig 5 Pulsed Forward Current vs Duty Ratio

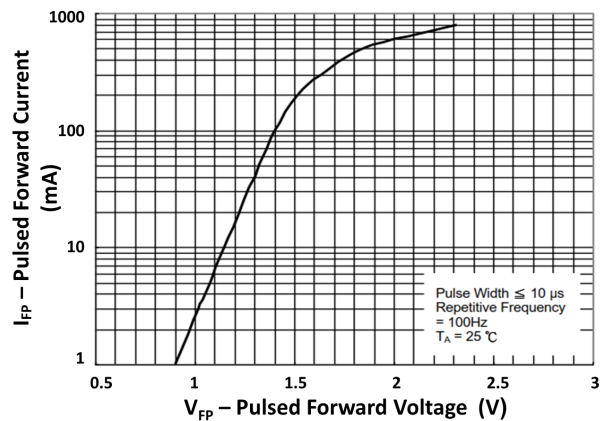


Fig 6 Pulsed Forward Current vs Pulsed Forward Voltage

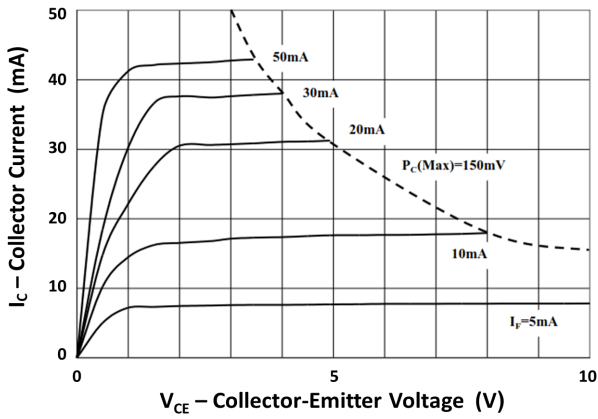


Fig 7 Collector Current vs Collector-Emitter Voltage (1)

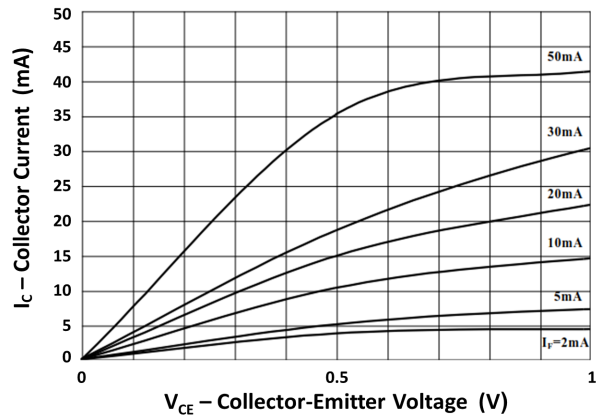


Fig 8 Collector Current vs Collector-Emitter Voltage (2)

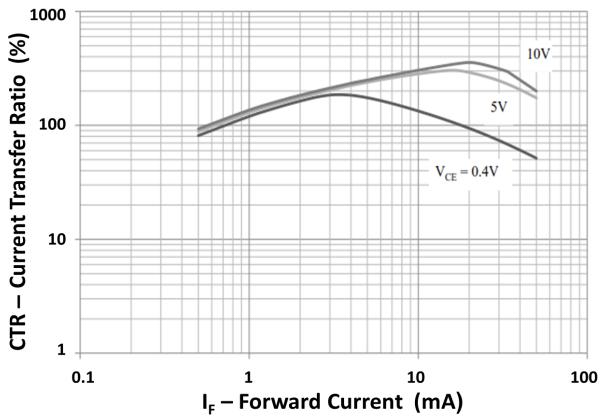


Fig 9 Current Transfer Ratio vs Forward Current

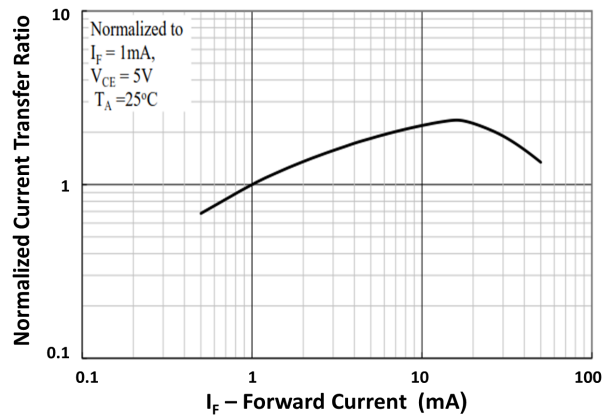


Fig 10 Normalized Current Transfer Ratio vs Forward Current

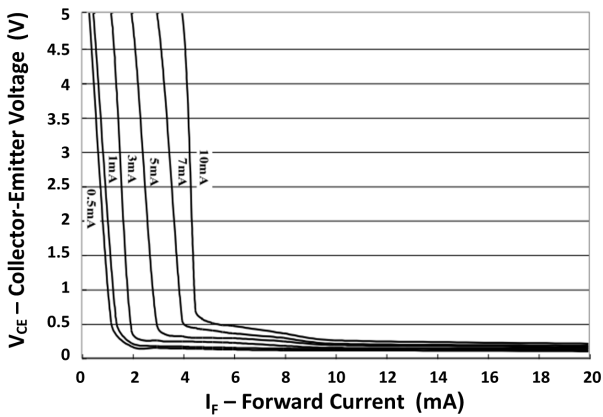


Fig 11 Collector-Emitter Voltage vs Forward Current

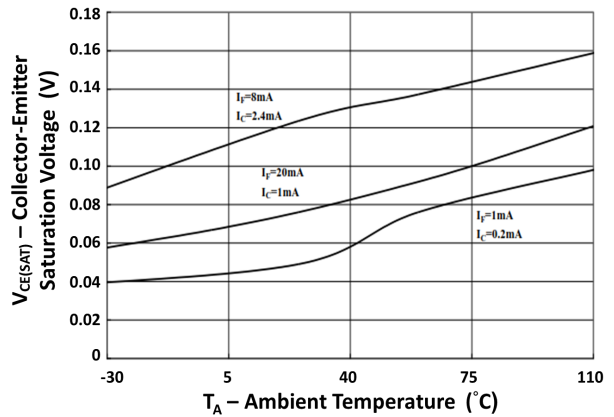


Fig 12 Collector-Emitter Saturation Voltage vs Ambient Temperature

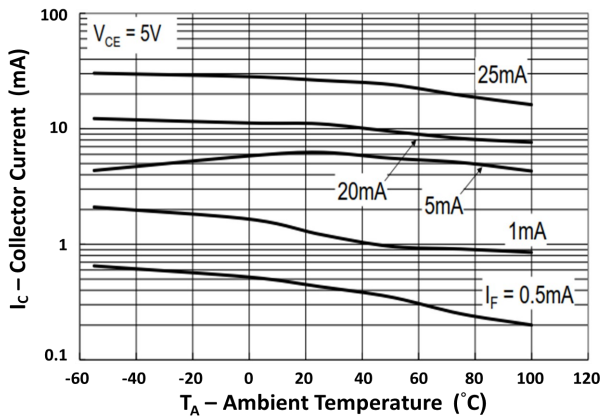


Fig 13 Collector Current vs Ambient Temperature

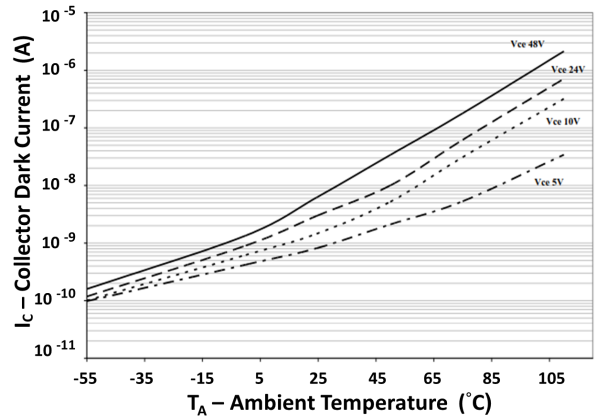


Fig 14 Collector Dark Current vs Ambient Temperature

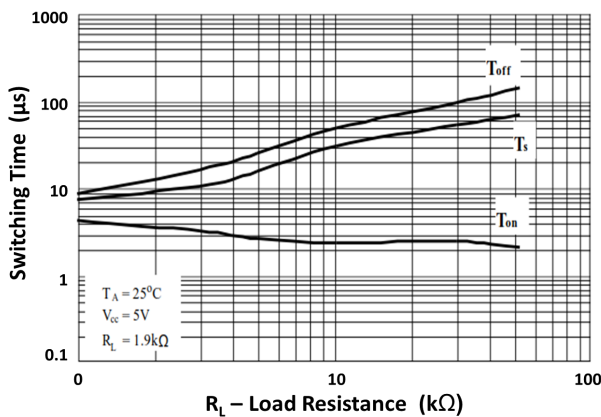


Fig 15 Switching Time vs Load Resistance

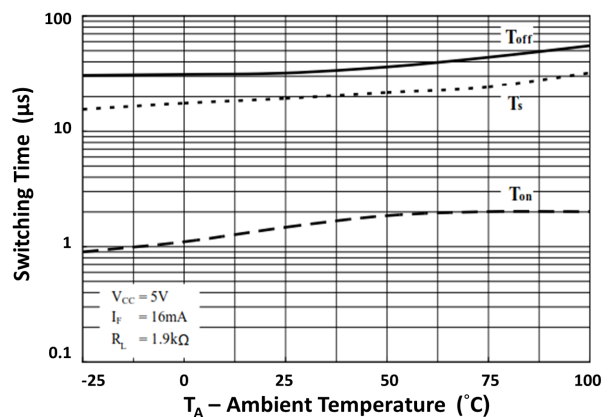


Fig 16 Switching Time vs Ambient Temperature

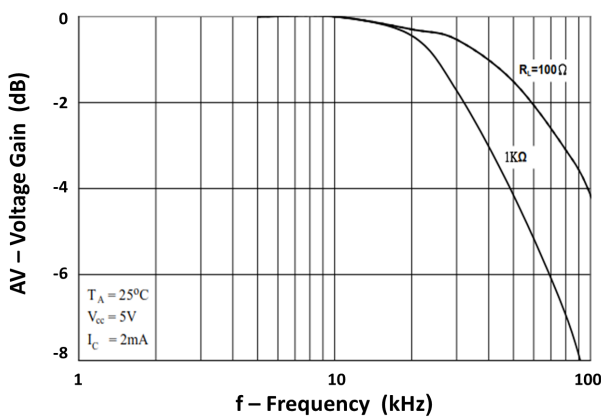
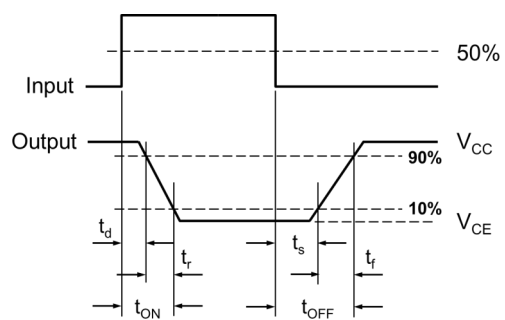
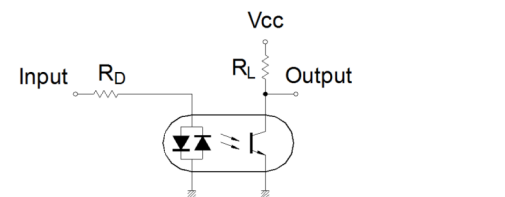


Fig 17 Frequency Response



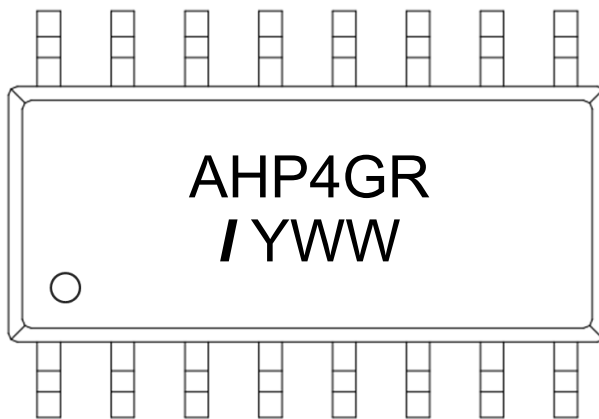
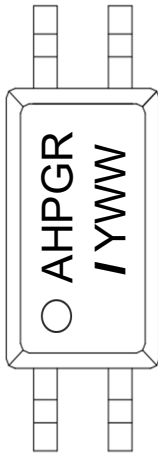
Switching Time Test Circuit

IS280GR / IS280-4GR

ORDER INFORMATION

IS280GR, IS280-4GR			
After PN	PN	Description	Packing quantity
CTR Grade	IS280GR	Surface Mount Tape & Reel	3000 pcs per reel
CTR Grade	IS280-4GR	Surface Mount Tape & Reel	2000 pcs per reel

DEVICE MARKING

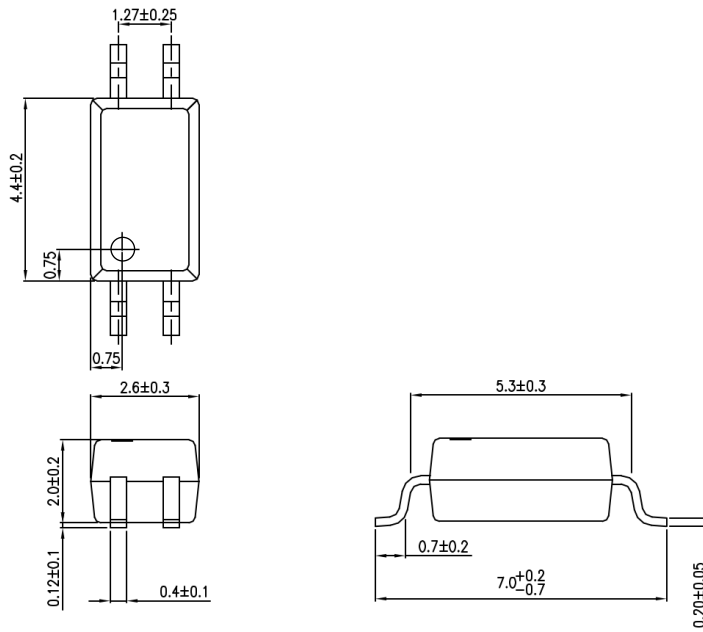


AHPGR	IS280GR
AHP4GR	IS280-4GR
/	Isocom
Y	Year Code (A = 2010, B = 2011, etc.)
WW	2 digit Week Code

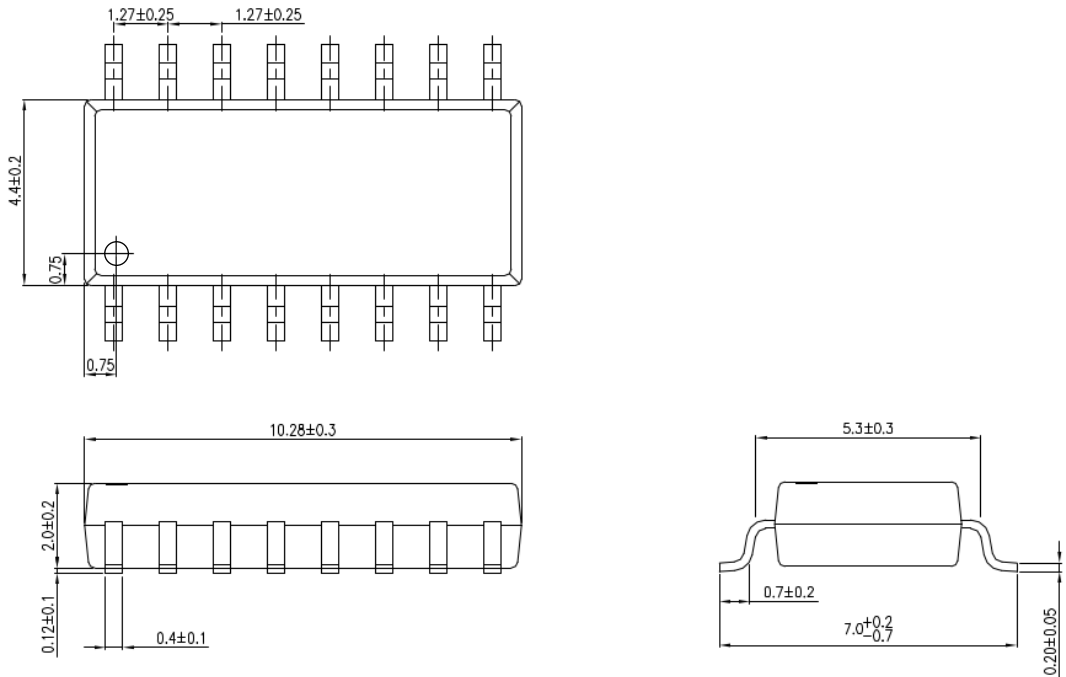
IS280GR / IS280-4GR

PACKAGE DIMENSIONS (mm)

IS280GR



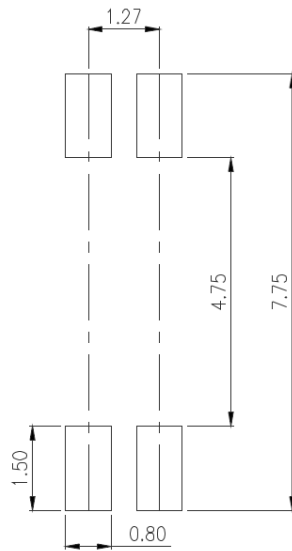
IS280-4GR



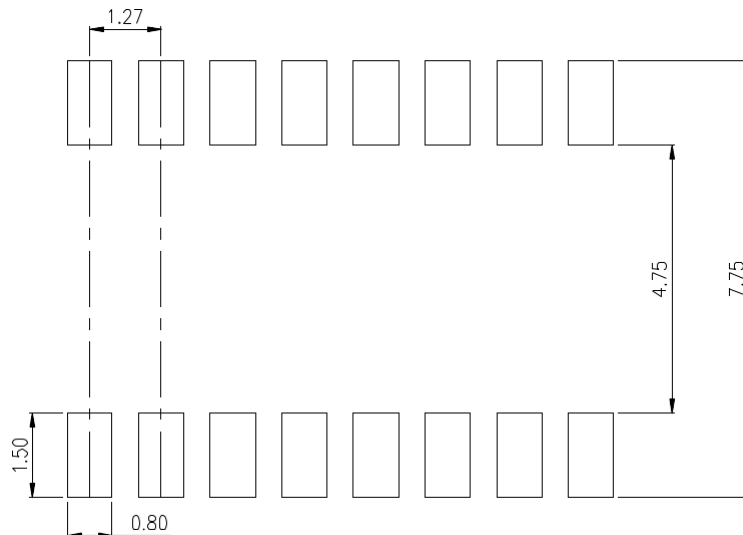
IS280GR / IS280-4GR

RECOMMENDED SOLDER PAD LAYOUT (mm)

IS280GR



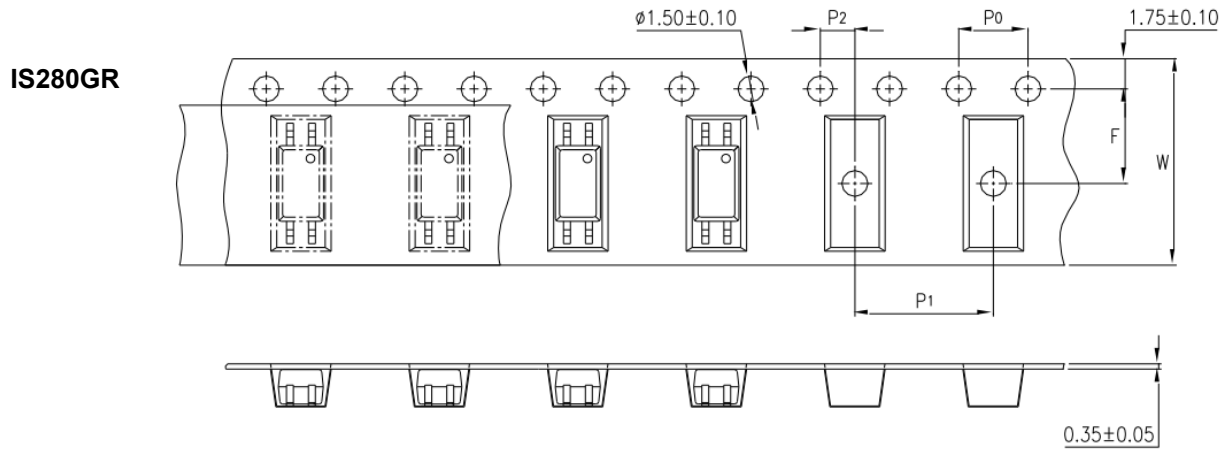
IS280-4GR





IS280GR / IS280-4GR

TAPE AND REEL PACKAGING

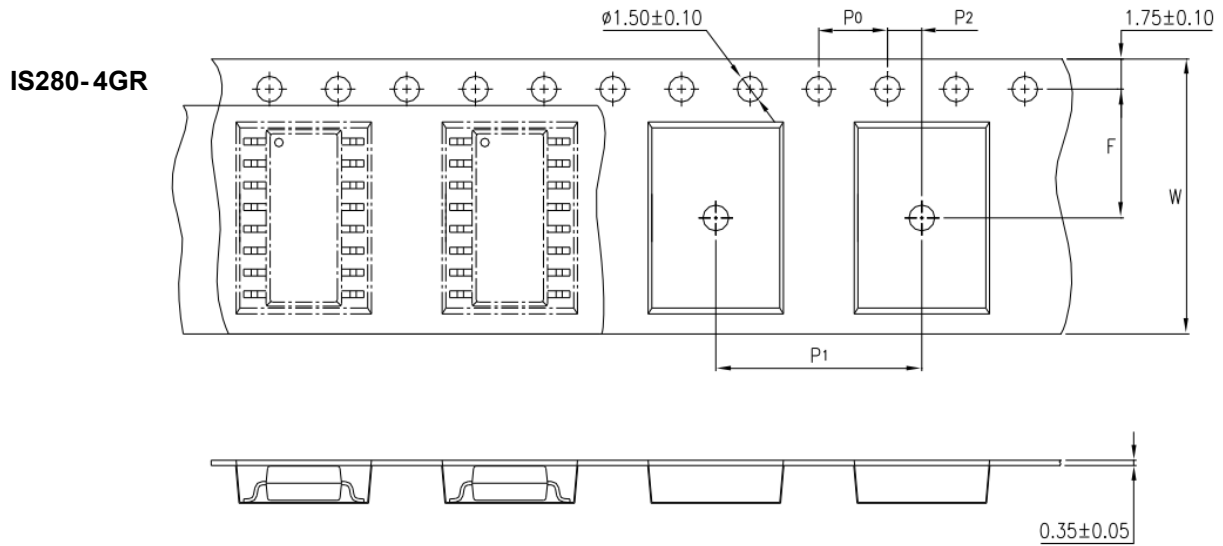


Description	Dimension	mm (inch)
Tape Width	W	12 ± 0.3 (0.47)
Pitch of Sprocket Holes	P0	4 ± 0.1 (0.15)
Distance of Compartment	F	5.5 ± 0.1 (0.217)
	P2	2 ± 0.1 (0.079)
Distance of Compartment to Compartment	P1	8 ± 0.1 (0.315)



IS280GR / IS280-4GR

TAPE AND REEL PACKAGING

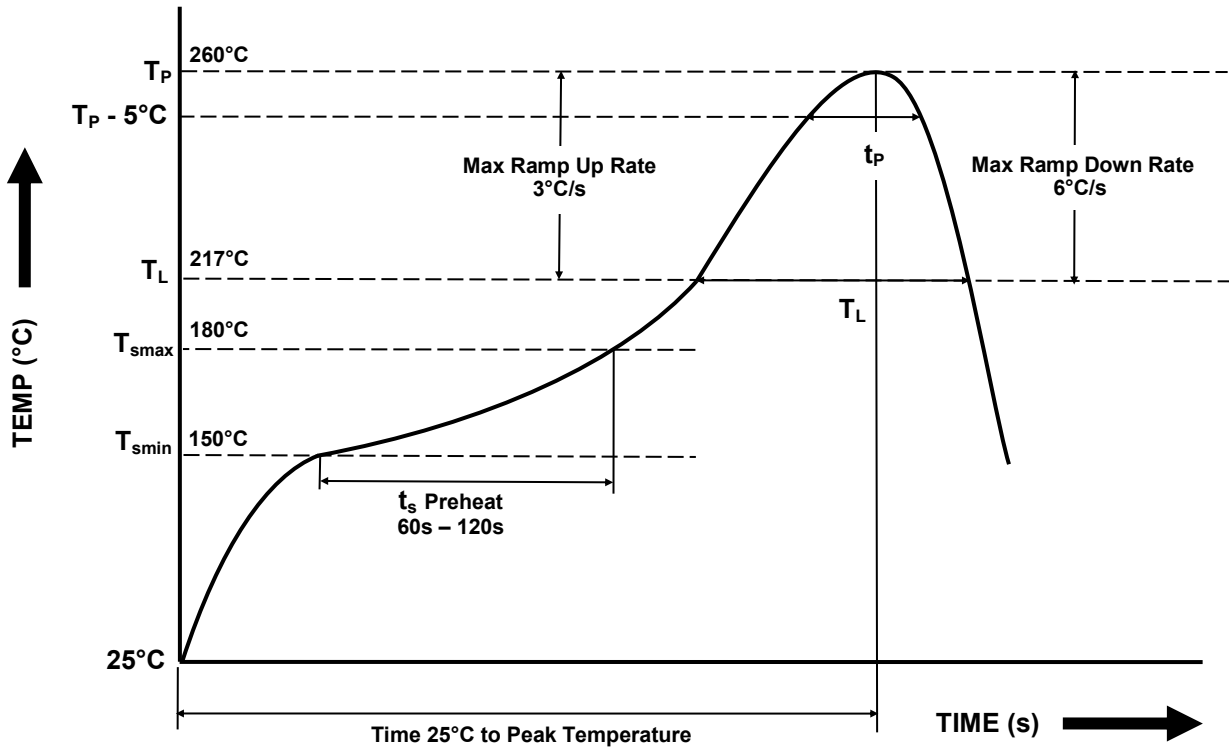


Description	Dimension	mm (inch)
Tape Width	W	16 ± 0.3 (0.63)
Pitch of Sprocket Holes	P0	4 ± 0.1 (0.15)
Distance of Compartment	F	7.5 ± 0.1 (0.295)
	P2	2 ± 0.1 (0.079)
Distance of Compartment to Compartment	P1	12 ± 0.1 (0.472)

IS280GR / IS280-4GR

IR REFLOW SOLDERING TEMPERATURE PROFILE

One Time Reflow Soldering is Recommended.
Do not immerse device body in solder paste.



Profile Details	Conditions
Preheat - Min Temperature (T _{SMIN}) - Max Temperature (T _{SMAX}) - Time T _{SMIN} to T _{SMAX} (t _s)	150°C 180°C 60s - 120s
Soldering Zone - Peak Temperature (T _P) - Liquidous Temperature (T _L) - Time within 5°C of Actual Peak Temperature (T _P - 5°C) - Time maintained above T _L (t _L) - Ramp Up Rate (T _L to T _P) - Ramp Down Rate (T _P to T _L)	260°C 217°C 20s 60s 3°C/s max 3 - 6°C/s
Average Ramp Up Rate (T _{smax} to T _P)	3°C/s max
Time 25°C to Peak Temperature	8 minutes max



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