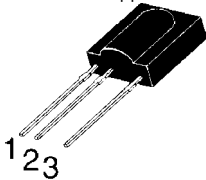
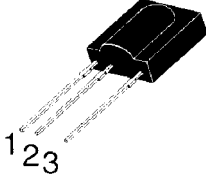
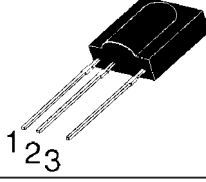
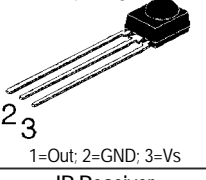
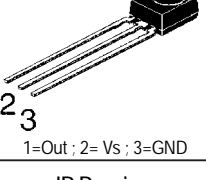
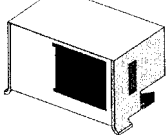
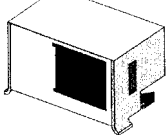


OPTO-DEVICE


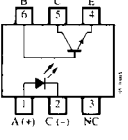

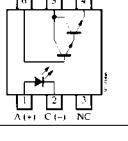

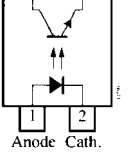

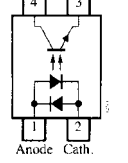

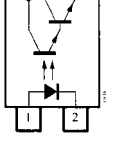
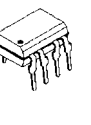
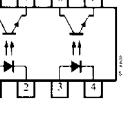
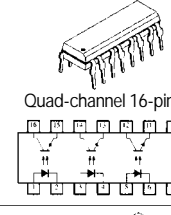
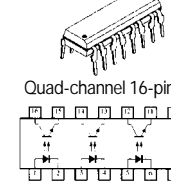


Vishay Receivers for IR-Remote Control

PRODUCT DESCRIPTION	TYPE	DIM. FIG.	FO(KHZ)	FEATURES
IR Receiver for Standard Applications 	TSOP1730 TSOP1733 TSOP1736 TSOP1737 TSOP1738 TSOP1740 TSOP1756	72 72 72 72 72 72 72	30 33 36 36.7 38 40 56	<ul style="list-style-type: none"> • Internal filter for PCM Frequency • Improved shielding against all electrical field disturbances • TTL and CMOS compatibility • Output active low • Continuous data transmissions possible (1200 bit/s) • Suitable burst length = / > 10 cycles/burst • 1 = GND ; 2 = Vs ; 3. = Out.
IR Receiver for use in Disturbed Ambience 	TSOP1230 TSOP1233 TSOP1236 TSOP1237 TSOP1238 TSOP1240 TSOP1256	72 72 72 72 72 72 72	30 33 36 36.7 38 40 56	<ul style="list-style-type: none"> • Enhanced immunity against all kind of disturbance light • No occurrence of disturbance pulses at the output • Continuous data transmission possible (1200 bit/s) • Suitable burst length = / > 10 cycles/burst • $t_p/T = 0.5$ • 1 = GND ; 2 = Vs ; 3. = Out.
IR Receiver for Short Burst Applications 	TSOP1130 TSOP1133 TSOP1136 TSOP1137 TSOP1138 TSOP1140 TSOP1156	72 72 72 72 72 72 72	30 33 36 36.7 38 40 56	<ul style="list-style-type: none"> • Enhanced data rate of 2400 bit/s. • Operation with short bursts possible(= / > 6 cycles/burst) • $t_p/T = 0.5$ • 1 = GND ; 2 = Vs ; 3. = Out.
IR Receiver for Standard Applications in small package 	TSOP1830 TSOP1833 TSOP1836 TSOP1837 TSOP1838 TSOP1840 TSOP1856	73 73 73 73 73 73 73	30 33 36 36.7 38 40 56	<ul style="list-style-type: none"> • Internal filter for PCM frequency • TTL and CMOS compatibility • Output active low • Small size package • Enhanced immunity against all kind of disturbance light. • No occurrence of disturbance pulses at the output • Short setting time after power on(< 200 us)
IR Receiver for Standard Applications in small package 	TSOP1830 TSOP1833 TSOP1836 TSOP1837 TSOP1838 TSOP1840 TSOP1856	73 73 73 73 73 73 73	30 33 36 36.7 38 40 56	<ul style="list-style-type: none"> • Internal filter for PCM frequency • TTL and CMOS compatibility • Output active low • Small size package • Enhanced immunity against all kind of disturbance light. • No occurrence of disturbance pulses at the output • Short setting time after power on(< 200 us)
IR Receiver for Standard Applications in SMD package 	TFMM5300 TFMM5330 TFMM5360 TFMM5370 TFMM5380 TFMM5400 TFMM5560	75 75 75 75 75 75 75	30 33 36 36.7 38 40 56	<ul style="list-style-type: none"> • Internal filter for PCM frequency • Enhanced immunity against all electrical field disturbances • TTL and CMOS compatibility • Output active low • Continuous data transmission possible(1200 bit/s) • Suitable burst length = / > 10 cycles/burst • $t_p/T = 0.5$ • Top-view package
IR Receiver for Standard Applications in SMD package 	TFMM5300 TFMM5330 TFMM5360 TFMM5370 TFMM5380 TFMM5400 TFMM5560	75 75 75 75 75 75 75	30 33 36 36.7 38 40 56	<ul style="list-style-type: none"> • Internal filter for PCM frequency • Enhanced immunity against all electrical field disturbances • TTL and CMOS compatibility • Output active low • Continuous data transmission possible(1200 bit/s) • Suitable burst length = / > 10 cycles/burst • $t_p/T = 0.5$ • Top-view package

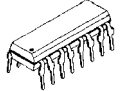
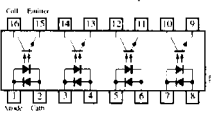

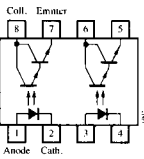
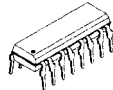
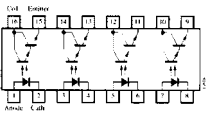

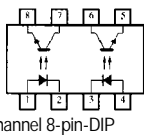

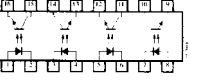

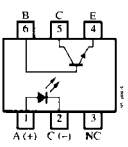




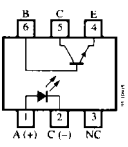
OPTO-Coupler



PRODUCT DESCRIPTION	TYPE	V _{IO} Fig. V _{RMS}	CTR I _F =10mA %	V _{CEO} V	V _{CEsat} ¹⁾ V	I _{F and} mA	I _C mA	t _{on} / t _{off} @ I _C R _L = 100 Ω μs / mA	Dim.	
Opto Couplers Opto Isolators for Standard Applications  	4N25 4N26 4N27 4N28 4N35 4N36 4N37	6-Pin Opto Isolators - with Transistor Output								
 	4N32 4N33	6-Pin Opto Isolators - with Darlington Output								
 	K817P K817P1 K817P2 K817P3 K817P4 K817P5 K817P6 K817P7 K817P8 K817P9	4-Pin Opto Isolators - with Transistor Output								
 	K814P	4-Pin Opto Isolators - with AC Input								
 	K815p	4-Pin Opto Isolators - with Darlington Output								
 	K827PH	Multi-Channel Opto Isolators - with Transistor Output								
	K847PH									
	K824p	Multi-Channel Opto Isolators - with AC Input								

¹⁾I_F=5mA, ²⁾I_F=1mA



PRODUCT DESCRIPTION	TYPE	V_{IO} V_{RMS}	CTR $I_F=10mA$ %	V_{CEO} V	V_{CESat} V	$I_{F\ and}$ mA	I_C mA	t_{on} / t_{off} $R_L = 100 \Omega$ $\mu s / mA$	Dim.
 Quad-channel 16-pin-DIP 	K844P	5000	> 20 ¹⁾	>70	< 0.3	10	1	6 / 2	86
<i>Multi-Channel Opto Isolators - with Transistor Output</i>									
 	K825P	5000	> 600 ³⁾	>70	< 0.3	10	1	60 / 10	84
<i>Multi-Channel Opto Isolators - with Darlington Output</i>									
 Quad-channel 16-pin-DIP 	K845P	5000	> 600 ³⁾	>70	< 0.3	10	1	60 / 10	86
¹⁾ $I_F=5mA$, ³⁾ $I_F=1mA$									
 Quad-channel 8-pin-DIP 	MCT6H CNY74-2H MCT62H	5000 ²⁾	> 60	>70	< 0.3	10	1	6 / 2	88
<i>Multi-Channel Opto Isolators - with Transistor Input</i>									
 Quad-Channel 16-pin-DIP 	CNY74-4H	5000	50 to 600 ¹⁾	>70	< 0.3	10	1	6 / 2	89
¹⁾ $I_F=5mA$, ²⁾ $I_F=V_{DC}$									
Opto Isolators For Power Supplies  6-pin-DIP 	4N25(G)V ⁴⁾ 4N35(G)V ⁴⁾	6000	100 (> 20)	>50	< 0.5	50	2	4 / 10	80/81
 0884  									
<i>6 Pin Opto Isolators - with Transistor Input</i>									
<i>No Base Connection</i>									
	TCDT1110(G) ⁴⁾	6000	150 (>100)	>70	< 0.3	10	0.5	10 / 2	80/81
 6-pin-DIP 	CQY80N(G) ⁴⁾ CNY17(G)-1 ⁴⁾ CNY17(G)-2 ⁴⁾ CNY17(G)-3 ⁴⁾ CNY17(G)-3 ⁴⁾	6000	90(> 50)	>50	< 0.3	10	1	9 / 5	80/81
⁴⁾ Order "G" devices e.g. K3011PG with wide-spaced 0.4" lead form, for 8 mm pcb spacing safety requirements									

Sharp Photo-Coupler

Type.	Model No.	Internal Connection Diagram	Features	Approved by safety standards				Package	Absolute maximum ratings			Electrical characteristics					
				UL	TUV (VDE 0884)	VDE 0884	Others		Forward Current I _F (mA)	Isolation Voltage (AC) V _{ios} (Vrms)	V _{CEO} (V)	Current transfer Ratio		Response Time			
												CTR (%) MIN.	I _F (mA)	t _r (μs) TYP.	R _L (Ω)		
Single photo transistor output	PC810		High isolation voltage, high speed at high load resistance	○	-	-	-	4-pin DIP	50	5,000	35	60	1	10	1,000		
	PC812		High isolation voltage, high resistance to noise	-	-	-	-		50	5,000	35	90	5	4	100		
	PC816		High isolation voltage, high collector-emitter voltage	○	-	-	-		50	5,000	70	50	5	4	100		
	PC817		High isolation voltage	○	○	-	-		50	5,000	35	50	5	4	100		
	PC818		High isolation voltage, high speed at high load resistance	○	○	-	-		50	5,000	35	10	1	7	1,000		
	PC851		High isolation voltage, high collector-emitter voltage	○	-	-	-		50	5,000	300	40	5	4	100		
	PC866		High isolation voltage, low current drive type, high collector-emitter voltage	○	-	-	-		50	5,000	80	100	1	8	100		
	PC813		High isolation voltage, AC input response high resistance to noise	○	-	-	-		±50	5,000	35	20	±1	4	100		
	PC814		High isolation voltage, AC input response	○	-	○	-		±50	5,000	35	20	±1	4	100		
	PC823		High isolation voltage, AC input response, high resistance to noise (2-ch)	○	-	-	-		8-pin DIP	±50	5,000	35	20	±1	4	100	
	PC824		High isolation voltage, AC input response (2-ch)	○	○	-	-										
	PC826		High isolation voltage, high collector-emitter voltage (2-ch)	○	-	-	-			50	5,000	70	50	5	4	100	
	PC8D66		High isolation voltage, low current type, high collector-emitter voltage	○	-	-	-			50	5,000	80	100	1	8	100	
	PC827		High isolation voltage (2-ch)	○	○	-	-			50	5,000	35	50	5	4	100	
	PC829		High isolation voltage, symmetrical terminal configuration	○	○	-	-			50	5,000	35	50	5	4	100	
	PC837		High isolation voltage (3-ch)	○	○	-	-			12-pin DIP	50	5,000	35	50	5	4	100
	PC846		High isolation voltage, high collector-emitter voltage (4-ch)	○	-	-	-			16-pin DIP	50	5,000	70	50	5	4	100
	PC8Q66		High isolation voltage, low current drive type, high collector-emitter voltage (4-ch)	○	-	-	-				50	5,000	80	100	1	8	100
	PC847		High isolation voltage (4-ch)	○	○	-	-				50	5,000	35	50	5	4	100
	PC849		High isolation voltage, symmetrical terminal configuration	○	○	-	-				50	5,000	35	50	5	4	100

○: Approved

(Ta=25 °C)



Agilent Optocoupler

<p>* NOTE: FOR 4502/3, 0452/3, PIN 7 IS NOT CONNECTED.</p> <p>TRUTH TABLE (POSITIVE LOGIC)</p> <table border="1"> <tr><td>LED</td><td>V_O</td></tr> <tr><td>ON</td><td>LOW</td></tr> <tr><td>OFF</td><td>HIGH</td></tr> </table>	LED	V _O	ON	LOW	OFF	HIGH	Minimum CMR		Current Transfer Ratio(%)	8-Pin DIP(300Mil)		Small-Outline SO-8		Widebody (400 Mil)	Hermetic
	LED	V _O													
	ON	LOW													
	OFF	HIGH													
	dV/dt (V/ μ s)	V _{CM} (V)	Single Channel Package	Dual Channel Package*	Single Channel Package	Dual Channel Package*	Single Channel Package	Dual Channel Package*							
1,000	10	7	6N135	HCPL-2530	HCPL-0500	0530	HCNW135								
		19	6N136 HCPL-4502**	HCPL-2531	HCPL-0501 HCPL-0452**	HCPL-0531	HCNW136 HCNW4502**								
		15	HCPL-2502												
15,000	1500	19	HCPL-4503**	HCPL-4534	HCPL-0453**	HCPL-0534	HCNW4503**								
1,000	10	9						HCPL-55XX HCPL-65XX 4N55							

Note :

* Technical data for these products are on separate Agilent publications

** Pin 7, transistor base, is not connected.

<p>TRUTH TABLE (POSITIVE LOGIC)</p> <table border="1"> <tr><td>LED</td><td>V_O</td></tr> <tr><td>ON</td><td>LOW</td></tr> <tr><td>OFF</td><td>HIGH</td></tr> </table>	LED	V _O	ON	LOW	OFF	HIGH	8-Pin DIP (300(Mil))		Small Outline SO-8		Widebody Package (400mil)	Minimum Input ON Current (I _e)	Minimum CTR	Absolute Maximum V _{CC}	Hermetic
	LED	V _O													
	ON	LOW													
	OFF	HIGH													
	Single Channel Package	Dual Channel Package HCPL-	Single Channel Package	Dual Channel Package HCPL-	Single Channel Package	Single and Dual Channel Packages HCPL-									
6N139	2731 ^[1]	0701	0731	HCNW139	0.4 mA	400%	18 V								
6N138	2730 ^[1]	0700	0730	HCNW138	1.6 mA	300%	7 V								
HCPL-4701 ^[1]	4731 ^[1]	070A ^[1]	073A ^[1]		40 μ A	800%	18 V								
					0.5 mA	300%	20 V	5701 ^[1] 5700 ^[1] 5731 ^[1] 5730 ^[1]							

Note :

^[1] Technical data are on separate Agilent Publications.

<p>6N137, HCPL-2601/2611 HCPL-0600/0601/0611 HCNW137/2601/2611</p> <p>TRUTH TABLE (POSITIVE LOGIC)</p> <table border="1"> <tr><td>LED</td><td>ENABLE</td><td>OUTPUT</td></tr> <tr><td>ON</td><td>H</td><td>L</td></tr> <tr><td>OFF</td><td>H</td><td>H</td></tr> <tr><td>ON</td><td>L</td><td>H</td></tr> <tr><td>OFF</td><td>L</td><td>H</td></tr> <tr><td>ON</td><td>NC</td><td>L</td></tr> <tr><td>OFF</td><td>NC</td><td>H</td></tr> </table> <p>HCPL-2630/2631/4661 HCPL-0630/0631/0661</p> <p>TRUTH TABLE (POSITIVE LOGIC)</p> <table border="1"> <tr><td>LED</td><td>OUTPUT</td></tr> <tr><td>ON</td><td>L</td></tr> <tr><td>OFF</td><td>H</td></tr> </table>	LED	ENABLE	OUTPUT	ON	H	L	OFF	H	H	ON	L	H	OFF	L	H	ON	NC	L	OFF	NC	H	LED	OUTPUT	ON	L	OFF	H	Minimum CMR		Input On-Current (mA)	Output Enable	8-Pin DIP(300 Mil)		Small-Outline SO-8		Widebody (400 Mil)	Hermetic
	LED	ENABLE	OUTPUT																																		
	ON	H	L																																		
	OFF	H	H																																		
	ON	L	H																																		
	OFF	L	H																																		
	ON	NC	L																																		
	OFF	NC	H																																		
	LED	OUTPUT																																			
	ON	L																																			
OFF	H																																				
dV/dt (V/ μ s)	V _{CM} (V)	Single Channel Package	Dual Channel Package	Single Channel Package	Dual Channel Package	Single Channel Package	Dual Channel Package																														
NA	NA	5	YES	6N137		HCPL-0600		HCNW137																													
5,000	50		NO		HCPL-2630		HCPL-0630																														
			YES	HCPL-2601		HCPL-0601		HCNW2601																													
10,000	1,000		YES	HCPL-2611		HCPL-0611		HCNW2611																													
			NO		HCPL-4661		HCPL-0661																														
1,000	50		YES	HCPL-2602 ^[1]																																	
3,500	300	YES	HCPL-2612 ^[1]																																		
1,000	50	3	YES	HCPL-261A ^[1]		HCPL-061A ^[1]																															
			NO		HCPL-263A ^[1]		HCPL-063A ^[1]																														
			YES	HCPL-261N ^[1]		HCPL-061N ^[1]																															
1,000 ^[2]	1,000		NO		HCPL-263N ^[1]		HCPL-063N ^[1]																														
1,000	50	12.5	^[3]					HCPL-193X ^[1] HCPL-56XX ^[1] HCPL-66XX ^[1]																													

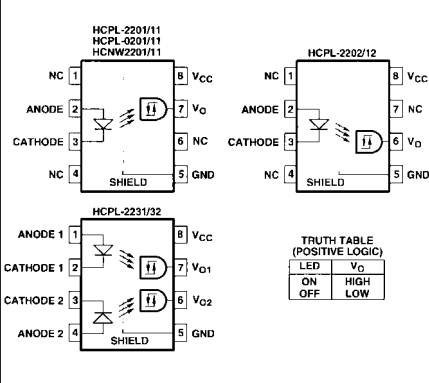
Notes:

^[1] Technical data are on separate Agilent publications.

^[2] 15 kV/ μ s with VCM=1 kV can be achieved using Agilent application circuit.

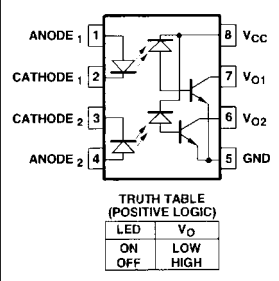
^[3] Enable is available for single channel products only, except for HCPL-193X devices.

Optocoupler(cont.)

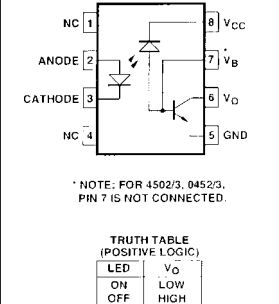
	Minimum CMR		Input On-Current (mA)	8-Pin DIP(300 Mil)		Small-Outline SO-8	Widebody (400 Mil)	Hermetic
	dV/dt (V/ μ s)	V _{CM} (V)		Single Channel Package	Dual Channel Package	Single Channel Package	Single Channel Package	Single and Dual Channel Package
	1,000	50	1.6	HCPL-2200 ^[1] , HCPL-2201, HCPL-2202		HCPL-0201	HCNW2201	
			1.8		HCPL-2231			
	2,500	400	1.6	HCPL-2219 ^[2]				
			1.8	HCPL-2211, HCPL-2212		HCPL-0211	HCNW2211	
	1,000	50	2.0					HCPL-52XX ^[2] , HCPL-62XX ^[2]

Notes:

- ^[1] HCPL-2200/2219 devices include output enable/disable function.
- ^[2] Technical data for the HCPL-2200/2219, HCPL-52XX and HCPL-62XX are on separate Agilent publications.
- ^[3] Minimum CMR of 10 kV/ μ s with V_{CM}=1000 V can be achieved with input current, I_F of 5 mA.

	Minimum CMR		Current Transfer Ratio(%)	8-Pin DIP(300Mil)		Small-Outline SO-8		Widebody (400 Mil)	Hermetic
	dV/dt (V/ μ s)	V _{CM} (V)		Dual Channel Package	Single Channel Package*	Dual Channel Package	Single Channel Package*	Dual Channel Package	Single and Dual Channel Package*
	1,000	10	7	HCPL-2530	6N135	HCPL-0530	HCPL-0500	HCNW135	
			19	HCPL-2531	6N136, HCPL-4502	HCPL-0531	HCPL-0501, HCPL-0452	HCNW136, HCNW4502	
	15,000	1500	19	HCPL-4534	HCPL-4503	HCPL-0534	HCPL-0453	HCNW4503	
	1,000	10	9						HCPL-55XX, HCPL-65XX, 4N55

* Technical data for these products are on separate Agilent publications.

	Minimum CMR		Current Transfer Ratio(%)	8-Pin DIP(300Mil)		Small-Outline SO-8		Widebody (400 Mil)	Hermetic
	dV/dt (V/ μ s)	V _{CM} (V)		Single Channel Package	Dual Channel Package*	Single Channel Package	Dual Channel Package*	Single Channel Package	Single and Dual Channel Package*
<p><small>* NOTE: FOR 4502/3, 0452/3, PIN 7 IS NOT CONNECTED.</small></p>	1,000	10	7	6N135	HCPL-2530	HCPL-0500	HCPL-0530	HCNW135	
			19	6N136, HCPL-4502**	HCPL-2531	HCPL-0501, HCPL-0452**	HCPL-0531	HCNW136, HCNW4502**	
			15	HCPL-2502					
	15,000	1500	19	HCPL-4503**	HCPL-4534	HCPL-0453**	HCPL-0534	HCNW4503**	
	1,000	10	9						HCPL-55XX, HCPL-65XX, 4N55

* Technical data for these products are on separate Agilent publications.
** Pin 7, transistor base, is not connected.

Infrared Products

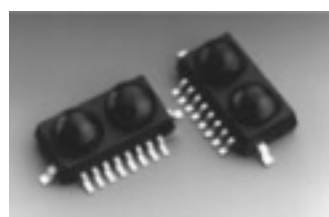
Infrared

Agilent's infrared components have already been designed into a wide range of end products including notebook PC's cellular phone, PDA's, printers, digital cameras and industrial handheld devices.

- IrDA Compliant Transceivers : 115Kb/s, 4.0Mb/s
- Discrete Emitters, Detectors



Part Number	Absolute Maximum Ratings							Electrical & Optical Specifications					
	Ts	Ta	I _{LED(DC)} (m)	I _{LED(PK)} (mA)	I _{LED(RP)} (mA)	V _{LEDA} (v)	V _{LEDC} (v)	V _{OL} (v)	V _{OH} (v)	I _{EL} (μW/SR)	I _{EH} (mW/SR)	nm	r
HSDL-1000	-20~75	0~75	100	500	1000	-0.5~7.0	-0.5~V _{LEDC}	0.4	V _{CC} -0.5	0.3	44~250	875	30~60
HSDL-1001	-20~85	0~75	100	500	1000	-0.5~7.0	V _{LEDC}	0.4	V _{CC} -0.6	0.3	44~250	875	30~60
HSDL-1100	-20~85	0~75	165	660	1000	-0.5~7.0	-0.5~7.0	0.5	V _{CC} -0.6	0.3	324	875	30~60
HSDL-2100	-20~85	0~75	165	750	350~660	-0.5~7.0	-0.5~7.0	0.5	V _{CC} -0.6	0.3	500	875	30~60
HSDL-2300	-20~85	70	165	750	650	-0.5~7.0	-0.5~7.0	0.4	V _{CC} -0.2	0.3	100~177	875	30~60
HSDL-3201	-40~100	-20~85	-20~70	750	-	-0.5~7.0	-	-	-	-	-	875	30~60
HSDL-3600	-40~100	-20~70	-20~70	750	-	-0.5~7.0	-	-	-	-	100~400	875	30~60
HSDL-3601	-40~100	-20~70	-20~70	750	-	-0.5~7.0	-	-	-	-	100~400	875	30~60
HSDL-3610	-40~100	-20~70	-20~70	750	-	-0.5~7.0	-	-	-	-	100~400	875	30~60



HSDL-1100 Series



HSDL-1100



HSDL-2100



HSDL-2300



HSDL-3201



HSDL-3601#007, HSDL-3601#008



HSDL-3610#007, HSDL-3610#008

Motion Control Products

Motion Control Technical Data

Agilent Technologies motion sensing products include the industry's smallest, most cost-effective surface-mount reflective optical encoder; as well as a range of other optical encoders and optical encoder modules for closed-loop servo applications, and rotary link converting mechanical shaft rotation or linear movement into TTL level signal. Motion control ICs complement the optical products and greatly simplify the design of motion control systems.

HCTL-1100 Series	General Purpose Motion Control ICs
HCTL-2000/HCTL-2016/HCTL-2020	Quadrature Decoder / Counter Interface ICs
HCTL-2016#PLC/HCTL-2020#PLC	Surface Mount Quadrature Decoder / Counter Interface ICs
HEDL-550X/554X/556X/557X/560X/9000/9100/9200	Encoder Line Drivers
HEDL-65XX, HEDM-65XX, HEDS-65XX Series	Large Diameter(56mm), Housed Two and Three Channel Optical Encoders
HEDM-550X/560X, HEDS-550X/554X/560X/564X	Quick Assembly Two and Three Channel Optical Encoders
HEDR-5300 Series	Quick Assembly Small diameter Two Channel Optical Encoders
HEDR-8000/8100 Series	Reflective Optical Surface Mount Encoders
HEDS-51X0/61X0 Series HEDG-512X/612X Series HEDM-512X/61XX Series	Two and Three Channel Codewheels for use with HP Optical Encoder Modules
HEDS-5700 Series	Panel Mount Optical Encoder
HEDS-9000 Series, HEDS-9100	Two Channel Optical Incremental Encoder Modules
HEDS-9040/9140	Three Channel Optical Incremental Encoder Modules
HEDS-9000/9100/9200 Extended Optical Encoder Modules	Two Channel High Resolution Optical Incremental Encoder Modules
HEDS-9200 Series	Linear Optical Encoder Modules
HEDS-973X Series	Small Optical Encoder Modules
HEDT-9000/9100	High Temperature 125°C Two Channel Optical Incremental Modules
HEDT-9040/9140	High Temperature 140°C Three Channel Optical Incremental Modules
HPRG Series	Miniature Panel Mount Optical Encoders

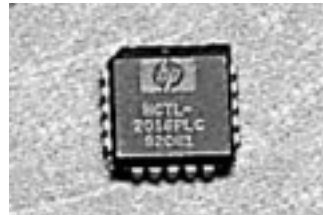
Motion Control Technical Data (cont.)



HCTL-1100 Series



HCTL-2000/HCTL-2016/HCTL-2020



HCTL-2016, HCTL-2020#PLC



HEDL-550X/554X/556X/557X/560X/564X
HEDL-9000/9100/9200/9140/9060/9160/9161



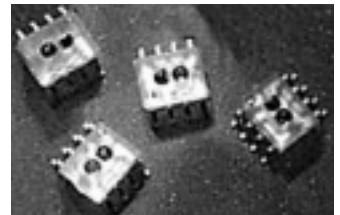
HEDL-65XX, HEDS-65XX Series



HEDM-550X HEDS-550X/554X/560X/564X



HEDR-5300 Series



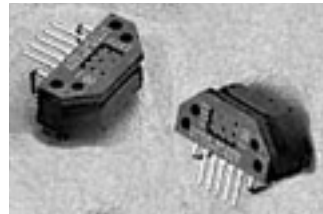
HEDR-8000/8100 Series



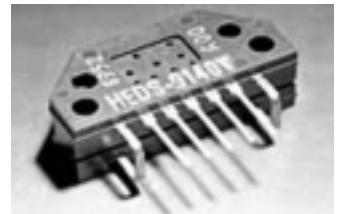
HEDS-51X0/61X0, HEDG-512X/612X
HEDM-512X/61XX Series



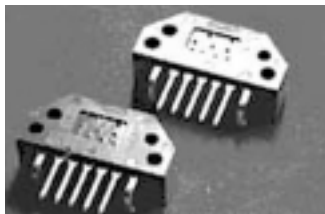
HEDS-5700 Series



HEDS-9000, HEDS-9100



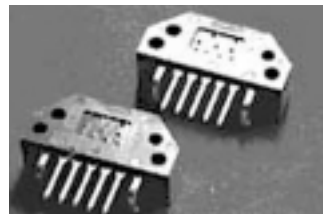
HEDS-9040/9140



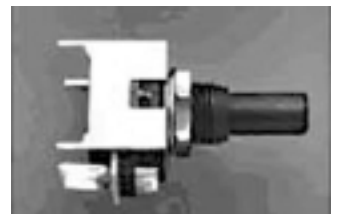
HEDS-9000/9100/9200 Series



HEDS-9700 Series






HEDT-9000/9100



HRPG Series

Toshiba Photo-Transistor

Type No.	Pin Connection	Features	CTR (%)				V _{CEO} (V)	BVs (Vrms)	Safety Standard			
			Rank	Min.	Max.	@I _c (mA)			UL	TUV	VDE	BSI
TLP320		4-pin small package, AC input, 150mA I _f Rating	-	20	80	±100	55	5,000	○			
TLP320-2		Two channels of TLP320	-	20	80	±100	55	5,000	○			
TLP320-4		Four channels of TLP320	-	20	80	±100	55	5000	○			

Type No.	Pin Connection	Features	CTR (%)				V _{CEO} (V)	BVs (Vrms)	Safety Standard			
			Rank	Min.	Max.	@I _F (mA)			UL	TUV	VDE	BSI
TLP321		4-pin pin small package, High V _{CEO}	-	50	600	5	80	5000	○			
			GB	100								
TLP321-2		Two channels of TLP 321	-	50	600	5	80	5000	○			
			GB									
TLP321-4		Four channels of TLP 321	-	50	600	5	80	5000	○			
			GB	100								
TLP330		150mA I _F Rating, AC input	-	20	80	±100	55	5000	○			
TLP331		Low input Current	-	100	1200	1	55	5000	○			
			BV	200								
TLP332		Low input Current, No internal base Connection	-	100	1200	1	55	5000	○			
			BV	200								
TLP504A		Standard	-	50	600	5	55	2500	○			
			GB	100								
TLP540A-2		Two channels of TLP504A	-	50	600	5	55	2500	△			
			GB	100								
TLP521-1		4pin small package Standard	A	50	600	5	55	2,500	○			
			GB	100								
			BL	200	300	5	55	2,500	○			
			YG	50								
			GR	100	200	5	55	2,500	○			
			GRL	100								
			GRH	150	300	5	55	2,500	○			
			Y	50								
				150								
TLP521-2		Two channels of TLP521-1	A	50	600	5	55	2,500	○			
			GB	100								
			BL	200	300	5	55	2,500	○			
			GR	100								
TLP521-4		Four channels of TLP521-1	A	50	600	5	55	2,500	○			
			GB	100								
TLP631		Standard High isolation	A	50	600	5	55	5,000	○			
			GB	100								
			BL	200	300	5	55	5,000	○			
			YG	50								
			GR	100	150	5	55	5,000	○			
			Y	50								
TLP632		Standard No internal base connection	A	50	600	5	55	5,000	○			
			GB	100								
			BL	200	300	5	55	5,000	○			
			YG	50								
			GR	100	150	5	55	5,000	○			
			Y	50								
TLP620		AC input 4pin small package VDE0884 approved with option (D4)	-	50	600	±5	55	5,000	○	△	○	○
			GB	100								
			GR	100	300	±5	55	5,000	○	△	○	○
			GB	100								
TLP620-2		Two channels of TLP620	-	50	600	±5	55	5,000	○	△	○	○
			GB	100								

○ : Approved, △ : Design which meets safety standards

Toshiba Photo-IC

Type No.	Pin Connection	Features	Data Rate (NRZ) Typ.	CTR	@I _r (mA)	BV _s (Vrms)	Safety Standard			
							UL	TUV	VDE	BSI
6N135		Standard	1Mbit/s	7% Min	16	2,500	○			
6N136				19% Min						
6N137		High speed	10Mbit/s	700% Min	5		○			
6N138		High CTR	300kbit/s	300% Min	1.6		○			
6N139				400% Min	0.5					
TLP215		Logic-in/Logic-out Buffer Type	I/O logic 5 μs (Max)	Logic Output	-		○			
TLP216		Logic-in/Logic-out Inverter Type	I/O logic 5 μs (Max)	Logic Output	-		○			
TLP250		Medium power IGBT/MOSFET direct drive	0.2us	±0.5A peak Min	5		○	△	○ VDE 0884 (Option D4)	
TLP251		Low Power IGBT/ MOSFET direct drive	0.3us	±0.1A peak Min	5		○	△	○	
TLP550		High speed No base connection	1Mbit/s	10% Min (19% Min for rank o)	16		2,500	○		
TLP557		G-TR direct drive	1us	0.25A Constant current output	5	○				
TLP558		3-state output Low input Inverter logic	5Mbit/s	3 state output	1.6	○				
TLP559		No base connection with internal shield	1Mbit/s	20% Min	16	○				
TLP759		V _{cc} =30V Max				5,000		○	△ VDE 0884	△ VDE 0884
TLP582		Fiber coupled	5Mbit/s	Totem pole output	5	○				
TLP750		IEC950 satisfied	1Mbit/s	10% Min	16	5,000	○	△ VDE 0884	○ VDE 0884	○ 415
TLP651		High isolation Internal base connection	1Mbit/s				4% Min	16	○	
TLP751		IEC65 satisfied		○	△ VDE 0884				○ VDE 0884	○ 415
TLP2200		3-state output Low input Buffer logic	5Mbit/s	3state Output	1.6		2,500	○		

Type No.	Pin Connection	Features	Data Rate (NRZ) Typ.	CTR	@I _f (mA)	BVs (Vrms)	Safety Standard			
							UL	TUV	VDE	BSI
TLP2530		Dual channel of 6N135	1Mbit/s	7% Min	16	2,500	○			
TLP2531		Dual channel of 6N136		19% Min			○			
TLP2601		High CMR High speed	10Mbit/s	Open collector	5		○			
TLP2630		Dual channel of 6N137	10Mbit/s	Open collector	5		○			
TLP2631		High CMR Dual channel of TLP2601	10Mbit/s	Open collector	5		○			

SENSOR



National Semiconductor Temperature Sensor

Part	Temp. Range	*Accuracy	Output Scale	Comments
LM34A	-50° F to +300° F	±2.0° F	10mV/° F	
LM34	-50° F to +300° F	±3.0° F	10mV/° F	
LM34CA	-40° F to +230° F	±2.0° F	10mV/° F	
LM34C	-40° F to +230° F	±3.0° F	10mV/° F	
LM34D	+32° F to +212° F	±4.0° F	10mV/° F	
LM35A	-55° C to +150° C	±1.0° C	10mV/° C	
LM35	-55° C to +150° C	±1.5° C	10mV/° C	
LM35CA	-40° C to +110° C	±1.0° C	10mV/° C	
LM35C	-40° C to +110° C	±1.5° C	10mV/° C	
LM35D	0° C to +100° C	±2.0° C	10mV/° C	
LM45B	-20° C to +100° C	±2.0° C	10mV/° C	SOT-23 Package
LM45C	-20° C to +100° C	±3.0° C	10mV/° C	SOT-23 Package
LM50	-40° C to +125° C	±2.0° C	10mV/° C	SOT-23 Package
LM60	-40° C to +125° C	±2.0° C	10mV/° C	SOT-23 Package, 2.7V Supply
LM75	-25° C to +100° C	±2.0° C	9 bits resolution	Digital (I ² C) Temperature Sensor
LM134-3	-55° C to +125° C	±3.0° C	I _{SET} ∞° K	
LM134-6	-55° C to +125° C	±6.0° C	I _{SET} ∞° K	
LM234-3	-25° C to +100° C	±3.0° C	I _{SET} ∞° K	
LM234-6	-25° C to +100° C	±6.0° C	I _{SET} ∞° K	
LM334	0° C to +70° C	±6.0° C	I _{SET} ∞° K	
LM135A	-55° C to +150° C	±1.3° C	10mV/° K	
LM135 †	-55° C to +150° C	±2.0° C	10mV/° K	
LM235A	-40° C to +125° C	±1.3° C	10mV/° K	
LM235	-40° C to +125° C	±2.0° C	10mV/° K	
LM335A	-40° C to +100° C	±2.0° C	10mV/° K	
LM335	-40° C to +100° C	±4.0° C	10mV/° K	

★ Note : Accuracy is measured over T (Min) to T (Max) uncalibrated.
 † Note : Military screening available.



Allegro Hall-Effect Sensor

Partial Part Number	Avail. Oper Temp.	Characteristics at T _A = +25 °C				Features	Notes
		B _{OP} max	B _{RP} min	B _{hys} typ			
HALL-EFFECT UNIPOLAR & OMNIPOLAR SWITCHES in order of B _{OP} and B _{hys}							
3240	E/L	+50	+5.0	10	chopper stabilized	1	
3209	E	±60	±5.0	7.7	400 μW, chopper stabilized		
3210	E	±60	±5.0	7.7	25 μW, chopper stabilized		
3361	E	+125	+40	5.0*	2-wire, chopper stabilized, inverted output		
3362	E	+125	+40	5.0*	2-wire, chopper stabilized		
3161	E	+160	+30	20	2-wire		
3141	E/L	+160	+10	55			
3235	S	+175	+25	15*	output 1	2	
		-25	-175	15*	output 2	2	
3140	E	+200	+50	55	300 mA power driver output	1	
3142	E/L	+230	+75	55			
3143	E/L	+340	+165	55			
3144	E/L	+350	+50	55			
3122	E/L	+400	+140	105			
3123	E/L	+440	+180	105			
3121	E/L	+450	+125	105			
GEARLESS UNIPOLAR & BIPOLAR SWITCHES in order of B _{OP} and B _{hys}							
3260	E/L	+30	-30	20	bipolar switch, chopper stabilized		
3280	E/L	+40	-40	45	chopper stabilized		
3134	E/L	+50	-50	27	bipolar switch		
3133	K/L/S	+75	-75	52	bipolar switch		
3281	E/L	+90	-90	100	chopper stabilized		
3132	K/L/S	+95	-95	52	bipolar switch		
3187	E/L	+150	-150	100*			
3177	S	+150	-150	200			
3625	S	+150	-150	200	900 mA power driver output	1, 3	
3626	S	+150	-150	200	400 mA power driver output	1, 3	
3195	E/L	+160	-160	220	active pulldown	1	
3197	L	+160	-160	230		1	
3175	S	+170	-170	200			
3188	E/L	+180	-180	200*			
3283	E/L	+180	-180	300	chopper stabilized		
3189	E/L	+230	-230	100*			
3275	S	+250	-250	100*		3	
3185	E/L	+270	-270	340*			

Operating Temperature Ranges: S= -20 °C to +85 °C, E= -40 °C to +85 °C, J= -40 °C to +115 °C, K= -40 °C to +125 °C, L= -40 °C to +150 °C

Notes 1. Protected

2. Output 1 switch on south pole, output 2 switches on north pole for 2-phase, bifilar-wound, unipolar-driven brushless dc motor control. Outputs may be tied together for omnipolar operation.

3. Complementary outputs for 2-phase bifilar-wound, unipolar-driven brushless dc motor control.

* Minimum † Maximum

† Latches will not switch on removal of magnetic field; bipolar switches may switch on removal of field but require field reversal for reliable operation over operating temperature range.

Partial Part Number	Avail. Oper Temp.	Characteristics at T _A = +25 °C				Features	Notes
		B _{OP} max	B _{RP} min	B _{hys} typ			
RATIOMETRIC, LINEAR HALL-EFFECT SENSORS							
3503	S			typ. 1.3 mV/G			
3507	E/L			typ. 2.5 mV/G			
3508	S			typ. 2.5 mV/G			
3515	E/L			typ. 5.0 mV/G	chopper stabilized		
3516	E/L			typ. 2.5 mV/G	chopper stabilized		
3517	L/S			typ. 5.0 mV/G	chopper stabilized		
3518	L/S			typ. 2.5 mV/G	chopper stabilized		
GEARTOOTH/RING MAGNET (DUAL ELEMENT) HALL-EFFECT SENSORS in order of B _{OP}							
3060	K/S	+35	-35	30	ac coupled		
3422	E/L	+75	-75	46	direction detection		
3059	K/S	+100	-100	130	ac coupled		
3056	E/L	+150	-150	50	zero-speed		
3058	E/L	+250	-250	200	zero-speed		
3421	E/L	+280	-280	335	direction detection		
SPECIAL-PURPOSE HALL-EFFECT SENSORS							
3054	K/S	+300	+5.0	50	unipolar switch, multiplexed	4	
3209	E	±60	±5.0	7.7	400 μW, chopper stabilized		
3210	E	±60	±5.0	7.7	25 μW, chopper stabilized		
3421	E/L	+280	-280	335	direction detection		
3422	E/L	+85	-85	46	direction detection		
3425	L	+24	-24	19	dual, chopper stabilized	1	

Operating Temperature Ranges: S= -20 °C to +85 °C, E= -40 °C to +85 °C, J= -40 °C to +115 °C, K= -40 °C to +125 °C, L= -40 °C to +150 °C

Notes 1. Protected

4. Multiplexed two-wire sensor; after proper address, power/signal bus current indicates magnetic field condition.