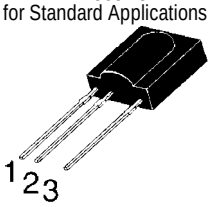
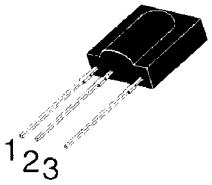
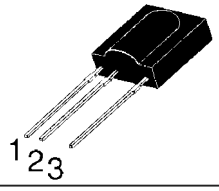
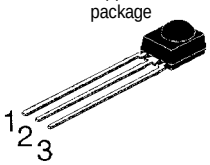
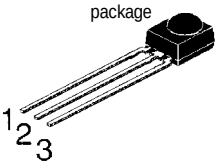
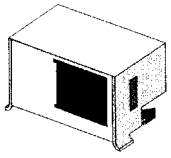
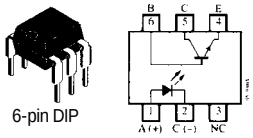
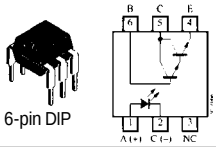
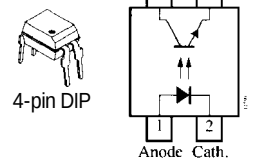
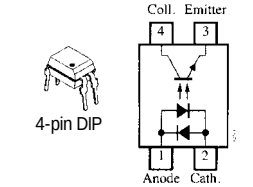
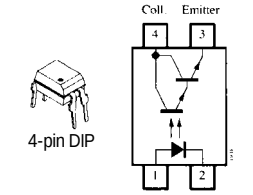
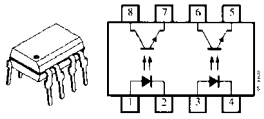
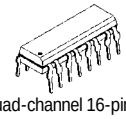
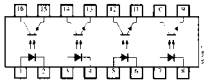
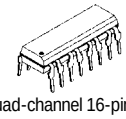
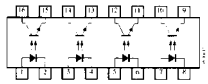
OPTO - DEVICE

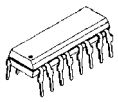
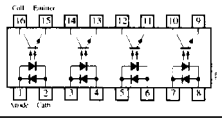
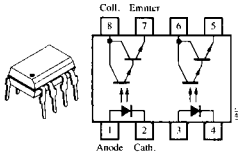
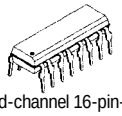
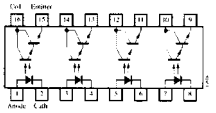
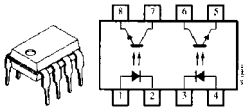
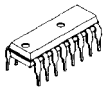
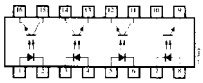
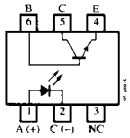
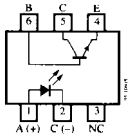
Vishay Receivers for IR-Remote Control

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	• Internal filter for PCM Frequency • Improved shieding 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	• Enhanced immunity against all kind of disturbance light • No occurance of disturbance pulses at the output • Continuous data transmission possible (1200 bit/s) • Suitable burst length = / > 10 cycles/burst • tp/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	• Enhanced data rate of 2400 bit/s. • Operation with short bursts possible(= / > 6 cycles/burst) • tp/T = 0.5 • 1 = GND ; 2 = Vs ; 3. = Out.
IR Receiver for Standard Applications in small package  1=Out; 2=GND; 3=Vs	TSOP1830 TSOP1833 TSOP1836 TSOP1837 TSOP1838 TSOP1840 TSOP1856	73 73 73 73 73 73 73	30 33 36 36.7 38 40 56	• Internal filter for PCM frequency • TTL and CMOS compatibility • Output active low • Small size package • Enhanced immunity against all kind of disturbance light. • No occurance of disturbance pulses at the output • Short setting time after power on(< 200 us)
IR Receiver for Standard Applications in small package  1=Out ; 2= Vs ; 3=GND	TSOP1830 TSOP1833 TSOP1836 TSOP1837 TSOP1838 TSOP1840 TSOP1856	73 73 73 73 73 73 73	30 33 36 36.7 38 40 56	• Internal filter for PCM frequency • TTL and CMOS compatibility • Output active low • Small size package • Enhanced immunity against all kind of disturbance light. • No occurance 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	• 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 • tp/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	• 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 • tp/T = 0.5 • Top-view package

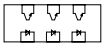
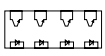
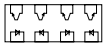
OPTO-Coupler

PRODUCT DESCRIPTION	TYPE	V_{IO} Fig. V_{RMS}	CTR I_F=10mA %	V_{CEO} V	$V_{CEsat@}$ 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  6-pin DIP										
			6-Pin Opto Isolators - with Transistor Output							
	4N25	3750	100(>20)	>32	< 0.5	50	2	4	10	80
	4N26	3750	100(>20)	>32	< 0.5	50	2	4	10	80
	4N27	3750	100(>20)	>32	< 0.5	50	2	4	10	80
	4N28	3750	100(>20)	>32	< 0.5	50	2	4	10	80
	4N35	3750	150(>100)	>32	< 0.3	10	0.5	< 10	2	80
	4N36	3750	150(>100)	>32	< 0.3	10	0.5	< 10	2	80
	4N37	3750	150(>100)	>32	< 0.3	10	0.5	< 10	2	80
 6-pin DIP			*6-Pin Opto Isolators - with Darlington Output*							
	4N32	3750	> 500	>55	< 1	8	2	50	50	80
	4N33	3750	> 500	>55	< 1	8	2	50	50	80
 4-pin DIP			*4-Pin Opto Isolators - with Transistor Output*							
	K817P	5000	50 to 600[1]	>70	< 0.3	10	1	6	2	82
	K817P1	5000	40 to 80	>70	< 0.3	10	1	6	2	82
	K817P2	5000	63 to 125	>70	< 0.3	10	1	6	2	82
	K817P3	5000	100 to 200	>70	< 0.3	10	1	6	2	82
	K817P4	5000	160 to 320	>70	< 0.3	10	1	6	2	82
	K817P5	5000	50 to 150[1]	>70	< 0.3	10	1	6	2	82
	K817P6	5000	100 to 300[1]	>70	< 0.3	10	1	6	2	82
	K817P7	5000	80 to 160[1]	>70	< 0.3	10	1	6	2	82
	K817P8	5000	130 to 260[1]	>70	< 0.3	10	1	6	2	82
	K817P9	5000	200 to 400[1]	>70	< 0.3	10	1	6	2	82
 4-pin DIP			*4-Pin Opto Isolators - with AC Input*							
	K814P	5000	> 20[1]	>70	< 0.3	10	1	6	2	82
 4-pin DIP			*4-Pin Opto Isolators - with Darlington Output*							
	K815p	5000	> 600[3]	>70	< 0.3	10	1	60	2	82
			*Multi-Channel Opto Isolators - with Transistor Output*							
	K827PH	5000	50 to 600[1]	>70	< 0.3	10	1	6	2	84
 Quad-channel 16-pin-DIP 	K847PH	5000	50 to 600[1]	>70	< 0.3	10	1	6	2	86
 Quad-channel 16-pin-DIP 	K824p	5000	> 20[1]	>70	< 0.3	10	1	6	2	84

[1] I_F=5mA, [3] 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} / $t_{off\ @}$ I_C R_L = 100 Ω µs	mA	Dim.
 Quad-channel 16-pin-DIP 	K844P	*Multi-Channel Opto Isolators - with Transistor Output*								
		5000	> 20[1]	>70	< 0.3	10	1	6	2	86
	K825P	*Multi-Channel Opto Isolators - with Darlington Output*								
		5000	> 600[3]	>70	< 0.3	10	1	60	10	84
 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	*Multi-Channel Opto Isolators - with Transistor Input*								
		5000[2]	> 60	>70	< 0.3	10	1	6	2	88
	CNY74-2H	5000[2]	50 to 600[1]	>70	< 0.3	10	1	6	2	88
	MCT62H	5000[2]	> 100[1]	>70	< 0.3	10	1	6	2	88
 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 		0884								
		6 Pin Opto Isolators - with Transistor Input								
	4N25(G)V [4]	6000	100 (> 20)	>50	< 0.5	50	2	4	10	80/81
	4N35(G)V [4]	6000	150 (> 100)	>70	< 0.3	10	0.5	10	2	80/81
		No Base Connection								
	TCDT1110(G) [4]	6000	150 (>100)	>70	< 0.3	10	0.5	10	2	80/81
 6-pin-DIP 		*With CTR Ranking*								
	CQY80N(G) [4]	6000	90(> 50)	>50	< 0.3	10	1	9	5	80/81
	CNY17(G)-1 [4]	6000	40 to 80	>50	< 0.3	10	1	9	5	80/81
	CNY17(G)-2 [4]	6000	63 to 125	>50	< 0.3	10	1	9	5	80/81
	CNY17(G)-3 [4]	6000	100 to 200	>50	< 0.3	10	1	9	5	80/81
	CNY17(G)-3 [4]	6000	160 to 320	>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 requirments								

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 IF (mA)	Isolation Voltage (AC) Vios (Vrms)	VCEO (V)	Current transfer Ratio		Response Time	
												CTR (%) MIN.	IF (mA)	tr (μs) TYP.	RL (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℃)

Agilent Optocoupler

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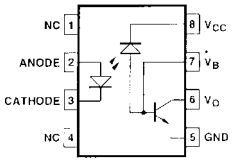
Innovating the HP Way



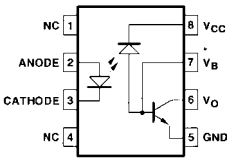
* NOTE: FOR 4502/3, 0452/3, PIN 7 IS NOT CONNECTED.

TRUTH TABLE (POSITIVE LOGIC)

LED	VO
ON	LOW
OFF	HIGH

Minimum CMR		Current Transfer Ratio(%)	8-Pin DIP(300Mil)		Small-Outline SO-8		Widebody (400 Mil)	Hermetic
dV/dt (V/μs)	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.

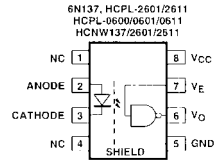


TRUTH TABLE

LED	VO
ON	LOW
OFF	HIGH

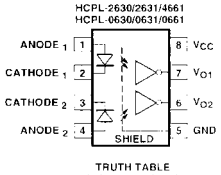
8-Pin DIP (300(Mil)		Small Outline SO-8		Widebody Package (400mil)	Minimum Input ON Current (I_F)	Minimum CTR	Absolute Maximum V_{CC}	Hermetic
Single Channel Package	Dual Channel Package HCPL-	Single Channel Package	Dual Channel Package HCPL-	Single Channel Package				Single and Dual Channel Packages 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 μA	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.



TRUTH TABLE (POSITIVE LOGIC)

LED	ENABLE	OUTPUT
ON	H	L
OFF	H	H
ON	L	H
OFF	L	H
ON	NC	L
OFF	NC	H



TRUTH TABLE (POSITIVE LOGIC)

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
dV/dt (V/μs)	V_{CM} (V)			Single Channel Package	Dual Channel Package	Single Channel Package	Dual Channel Package	Single Channel Package	Single and Dual Channel Package
NA	NA	5	YES	6N137		HCPL-0600		HCNW137	
			NO		HCPL-2630		HCPL-0630		
5,000	50		YES	HCPL-2601		HCPL-0601		HCNW2601	
			NO		HCPL-2631		HCPL-0631		
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]		
1,000[2]	1,000		YES	HCPL-261N[1]		HCPL-061N[1]			
			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/μs 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.)

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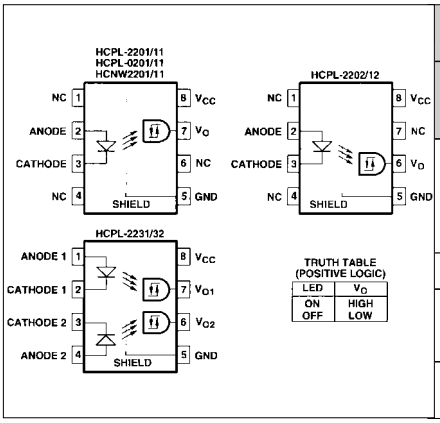
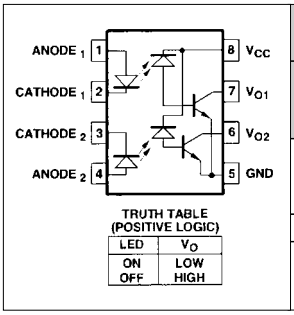


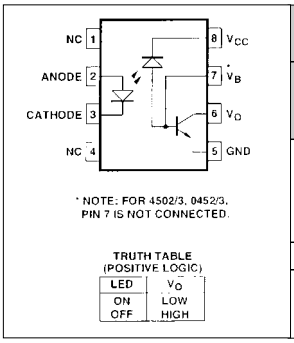
Minimum CMR		Input On-Current (mA)	8-Pin DIP(300 Mil)		Small-Outline SO-8	Widebody (400 Mil)	Hermetic
dV/dt (V/μs)	VC_M(V)		Single Channel Package	Dual Channel Package	Single Channel Package	Single Channel Package	Single and Dual Channel Package
1,000	50	1.6	HCPL-2200[1,2] HCPL-2201 HCPL-2202		HCPL-0201	HCNW2201	
		1.8		HCPL-2231			
2,500	400	1.6	HCPL-2219[1,2]				
5,000[3]	300[3]	1.6	HCPL-2211		HCPL-0211	HCNW2211	
		1.8	HCPL-2211	HCPL-2232			
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/μs 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/μs)	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/μs)	V_{CM} (V)		Single Channel Package	Dual Channel Package*	Single Channel Package	Dual Channel Package*	Single Channel Package	Single and Dual Channel Package*
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.

Infared Products

Infared

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 Transreceivers : 115Kb/s, 4.0Mb/s
- Discrete Emitters, Detectors

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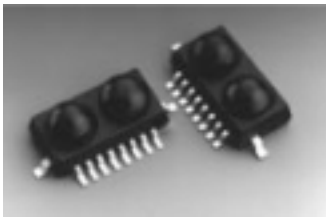
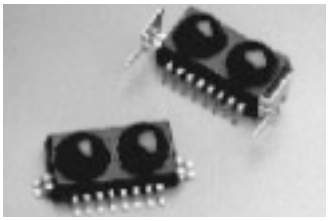
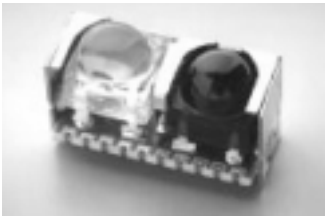
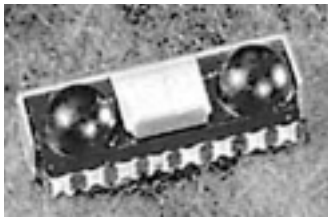
Part Number	Absolute Maximum Ratings							Electrical & Optical Specifications					
	Ts	Ta	I_{LED}(DC) (m)	I_{LED}(PK) (mA)	I_{LED}(RP) (mA)	V_{LEDA}(v)	V_{LEDC}(v)	V_{OL}(v)	V_{OH}(v)	I_{EL} (uW/SR)	I_{EH}(mW/SR)	nm	r
HSDL-1000	-20~75	0~75	100	500	1000	-0.5~7.0	-0.5~V_{LEDC}	0.4	Vcc-0.5	0.3	44~250	875	30~60
HSDL-1001	-20~85	0~75	100	500	1000	-0.5~7.0	V_{LEDC}	0.4	Vcc-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	Vcc-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	Vcc-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	Vcc-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

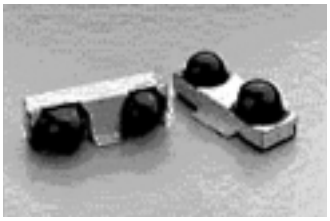

HSDL-1100 Series

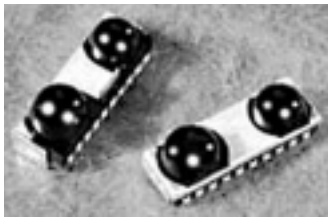

HSDL-1100


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, mostical surface-mount reflective optical encoder ; as well as a range of other optical encoders and optical encoder modules for closed-loop servo applications, and rota link converting mechanical shaft rotation or linear movement into TTL level signal Motion control Ics complement the optical products and greatly simplify the designtal motion control system.

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 Oprical 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	Lineal Oprical 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
HRPG Series	Miniature Pannel Mount Optical Encoders

Motion Control Technical Data (cont.)

Agilent Technologies
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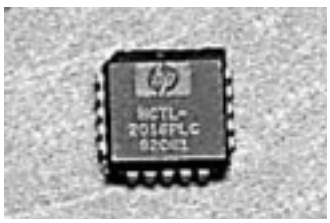
HCTL-1100 Series


HCTL-2000/HCTL-2016/HCTL-2020

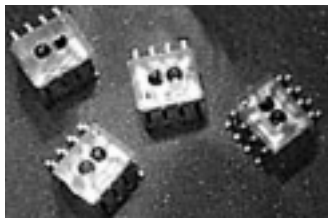

HCTL-2016, HCTL-2020#PLC

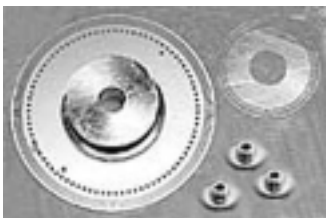

HEDL-550X/554X/556X/557X/560X/564X
HEDL-9000/9100/9200/9140/9060/9160/9161


HEDL-65XX, HEDS-65XX Series

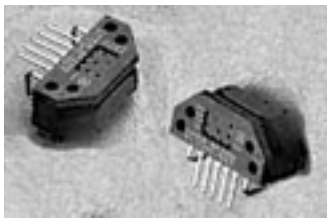

HEDM-550X HEDS-550X/554X/560X/564X

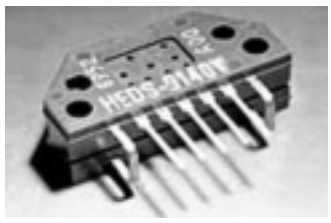

HEDR-5300 Series

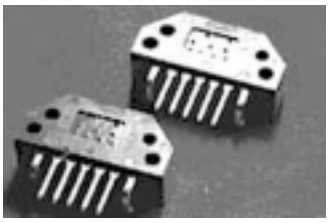

HEDR-8000/8100 Series


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

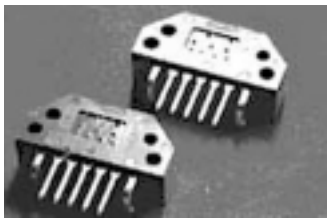

HEDS-5700 Series


HEDS-9000, HEDS-9100


HEDS-9040/9140

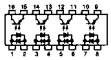

HEDS-9000/9100/9200 Series

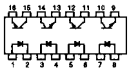

HEDS-9700 Series


HEDT-9000/9100


HRPG Series

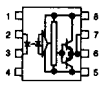
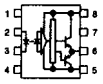
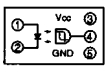
Toshiba Photo-Transistor

Type No.	Pin Connection	Features	CTR (%)				V_{CEO} (V)	BVs (Vrms)	Safety Standard			
			Rank	Min.	Max.	@I_F(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								
			GB									
TLP321-4		Four channels of TLP 321	-	50								
			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							
			BV	200								
TLP504A		Standard	-	50	600	5	55	2500	○			
			GB	100								
TLP540A-2		Two channels of TLP504A	-	50	600				△			
			GB	100								
TLP521-1		4pin small package Standard	A	50	600	5	55	2,500	○			
			GB	100								
			BL	200								
			YG	50	300							
			GR	100								
			GRL	100	200							
			GRH	150	300							
			Y	50	150							
TLP521-2		Two channels of TLP521-1	A	50	600	5	55	2,500	○			
			GB	100								
			BL	200								
			GR	100	300							
TLP521-4		Four channels of TLP521-1	A	50	600							
			GB	100								
TLP631		Standard High isolation	A	50	600	5	55	5,000	○			
			GB	100								
			BL	200								
			YG	50	300							
			GR	100								
			Y	50	150							
TLP632		Standard No internal base connection	A	50	600							
			GB	100								
			BL	200								
			YG	50	300							
			GR	100								
			Y	50	150							
TLP620		AC input 4pin small package VDE0884 approved with option (D4)	-	50	600	±5	55	5,000	○	△ VDE 0884	○ VDE 0884 with option (D4)	○ BSI 415
			GB	100								
			GR	100	300							
TLP620-2		Two channels of TLP620	-	50	600							
			GB	100								

○ : Approved, △ : Design which meets safety standards

Toshiba Photo-IC

Type No.	Pin Connection	Features	Data Rate (NRZ) Typ.	CTR	@I_F(mA)	BVs (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㎲ (Max)	Logic Output	-		○			
TLP216		Logic-in/Logic-out Inverter Type	I/O logic 5㎲ (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		Vcc=30V Max				5,000	○	△ VDE 0884	△ VDE 0884	△ 415
TLP582		Fiber coupled	5Mbit/s	Totempole output	5	5000	○			
TLP750		IEC950 satisfied	1Mbit/s	10% Min	16		○	△ VDE 0884	○ VDE 0884	○ 415
TLP651		High isolation Internal base connection	1Mbit/s				○			
TLP751		IEC65 satisfied		4% Min			○	△ 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^2C) 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 availble.

Allegro Hall-Effect Sensor

Partial Part Number	Avail.Oper Temp.	Characteristics at T_A = +25 ℃				
		B_{OP} max	B_{RP} min	B_{hys} typ	Features	Notes
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 oupput	
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		
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℃ to +85℃, E= -40℃ to +85℃, J= -40℃ to +115℃, K= -40℃ to +125℃, L= -40℃ to +150℃

Notes 1. Protected
2. Output 1 switch on south pole, output 2 switchs 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 ǂ Maximum

† Latches will not switch on removal of magnetic field; bipolar switchs 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 ℃				
		B_{OP} max	B_{RP} min	B_{hys} typ	Features	Notes
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 ℃ to +85℃, E= -40℃ to +85℃, J= -40℃ to +115℃, K= -40℃ to +125℃, L= -40℃ to +150℃

Notes 1. Protected
4. Multiplexed two-wire sensor; after proper address, power/signal bus current indicates magnetic field condition.