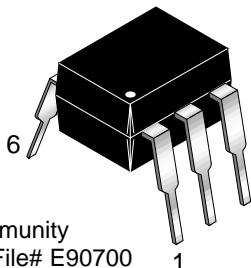


DESCRIPTION

The MOC8020 and MOC8021 are photodarlington-type optically coupled optocouplers. The devices have a gallium arsenide infrared emitting diode coupled with a silicon darlington phototransistor.

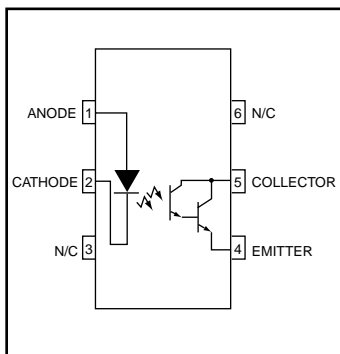
FEATURES

- High current transfer ratio
-500% (MOC8020)
-1000% (MOC8021)
- No base connection for improved noise immunity
- Underwriters Laboratory (UL) recognized File# E90700

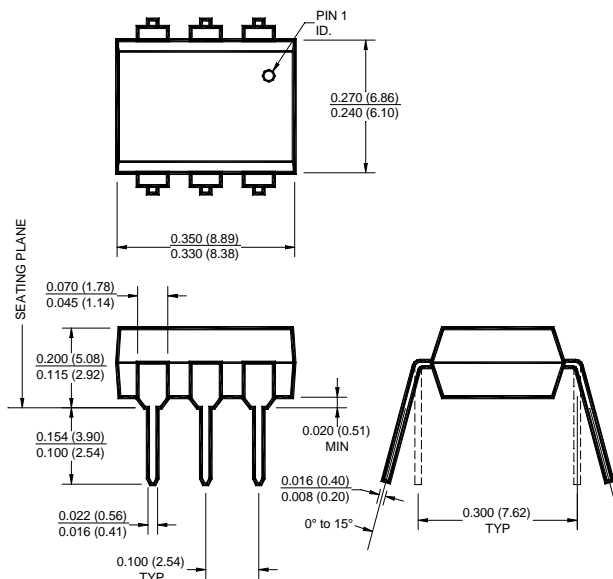


APPLICATIONS

- Appliances, measuring instruments
- I/O interface for computers
- Programmable controllers
- Portable electronics
- Interfacing and coupling systems of different potentials and impedance
- Solid state relays



PACKAGE DIMENSIONS



NOTE
All dimensions are in inches (millimeters)

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ Unless otherwise specified.)

Parameter	Symbol	Value	Units
TOTAL DEVICE			
Storage Temperature	T_{STG}	-55 to +150	$^\circ\text{C}$
Operating Temperature	T_{OPR}	-55 to +100	$^\circ\text{C}$
Lead Solder Temperature	T_{SOL}	260 for 10 sec	$^\circ\text{C}$
Total Device Power Dissipation @ $T_A = 25^\circ\text{C}$	P_D	250	mW
Derate above 25°C		2.94	mW/ $^\circ\text{C}$
Input-Output Isolation Voltage	V_{ISO}	5300	Vac(rms)
EMITTER			
DC/Average Forward Input Current	I_F	60	mA
Reverse Input Voltage	V_R	3	V
LED Power Dissipation @ $T_A = 25^\circ\text{C}$	P_D	120	mW
Derate above 25°C		1.41	mW/ $^\circ\text{C}$
DETECTOR			
Collector-Emitter Voltage	V_{CEO}	50	V
Detector Power Dissipation @ $T_A = 25^\circ\text{C}$	P_D	150	mW
Derate above 25°C		1.76	mW/ $^\circ\text{C}$
Continuous Collector Current	I_C	150	mA

MOC8020

MOC8021

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

INDIVIDUAL COMPONENT CHARACTERISTICS

Parameter	Test Conditions	Symbol	Min	Typ**	Max	Unit
EMITTER						
Input Forward Voltage	($I_F = 10\text{ mA}$)	V_F		1.15	2	V
Input Capacitance	($V_F = 0, f = 1\text{ MHz}$)	C_{IN}		18		pF
Reverse Leakage Current	($V_R = 3.0\text{ V}$)	I_R		0.05	10	μA
DETECTOR						
Collector-Emitter Breakdown Voltage	($I_C = 1.0\text{ mA}$)	BV_{CEO}	50			V
Emitter-Collector Breakdown Voltage	($I_E = 100\text{ }\mu\text{A}$)	BV_{ECO}	5			V
Collector-Emitter Dark Current	($V_{CE} = 10\text{ V}$)	I_{CEO}			100	nA

TRANSFER CHARACTERISTICS

DC Characteristic	Test Conditions	Symbol	Min	Typ**	Max	Units
Current Transfer Ratio,	MOC8020 ($I_F = 10\text{ mA}, V_{CE} = 5\text{ V}$)	CTR	500			%
Collector-Emitter	MOC8021 ($I_F = 10\text{ mA}, V_{CE} = 5\text{ V}$)		1000			
Collector-Emitter Saturation Voltage	($I_F = 10\text{ mA}, I_C = 25\text{ mA}$)	$V_{CE(SAT)}$			2	V

TRANSFER CHARACTERISTICS

Characteristic	Test Conditions	Symbol	Min	Typ**	Max	Units
SWITCHING TIMES						
Turn-on Time	($V_{CC} = 10\text{ V}, R_L = 100\Omega, I_F = 5\text{ mA}$)	t_{on}		3.5		μs
Turn-off Time		t_{off}		95		μs

ISOLATION CHARACTERISTICS

Characteristic	Test Conditions	Symbol	Min	Typ**	Max	Units
Input-Output Isolation Voltage	($I_{I-O} \leq 1\text{ }\mu\text{A}, 1\text{ min.}$)	V_{ISO}	7500			Vac(pk)
	($I_{I-O} \leq 1\text{ }\mu\text{A}, 1\text{ min.}$)		5300			Vac(rms)
Isolation Resistance	($V_{I-O} = 500\text{ VDC}$)	R_{ISO}	10^{11}			Ω
Isolation Capacitance	($f = 1\text{ MHz}$)	C_{ISO}		0.5		pf

Note
** Typical values at $T_A = 25^\circ\text{C}$

Fig. 1 Output Current vs. Input Current

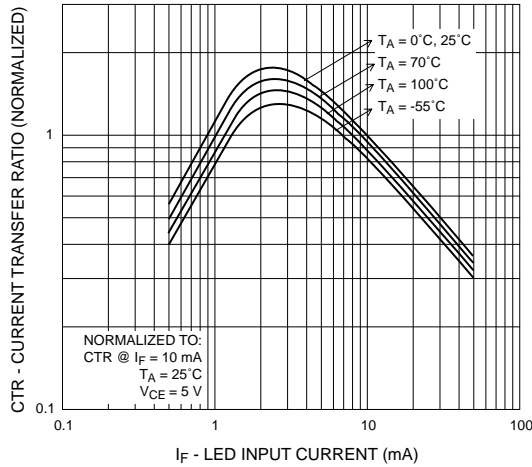


Fig. 2 Current Transfer Ratio vs. Ambient Temperature

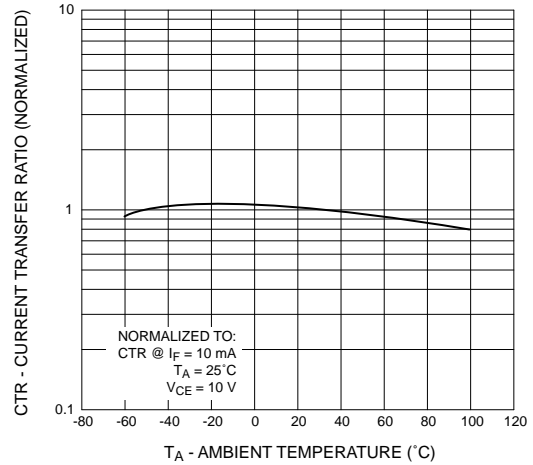


Fig. 3 Collector Current vs. Collector-Emitter Voltage

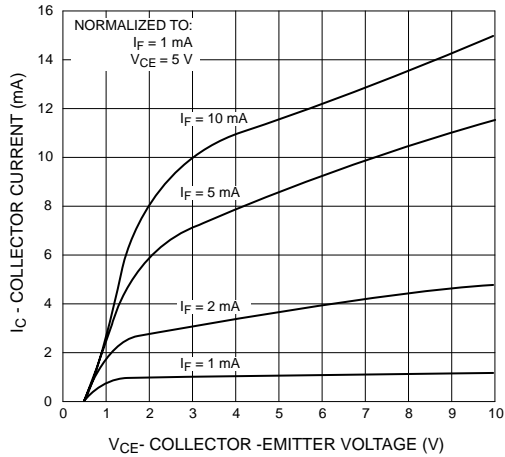


Fig. 4 Dark Current vs. Ambient Temperature

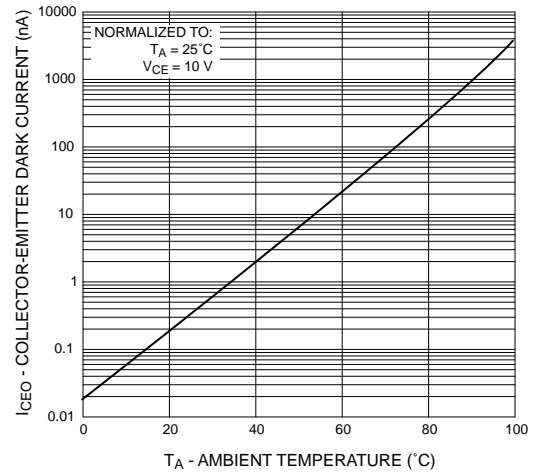


Fig. 5 Turn-On Time vs. Input Current

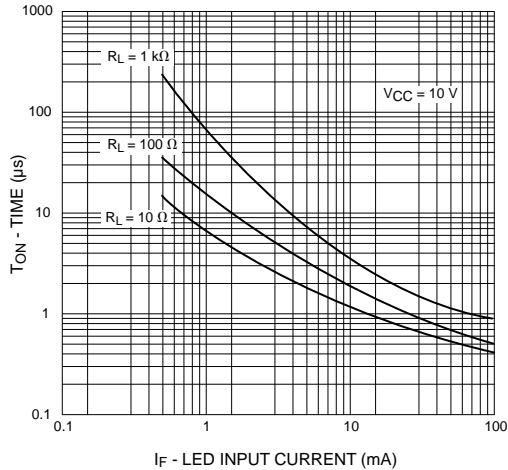
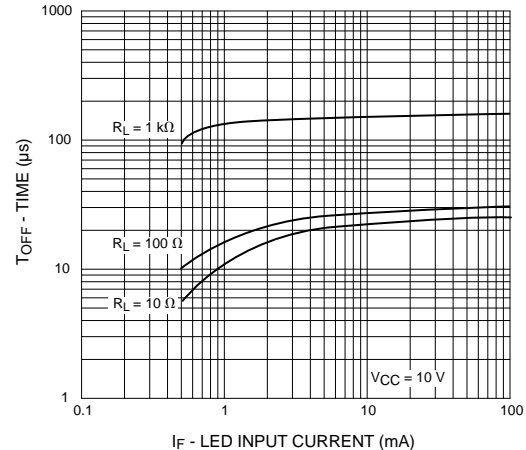


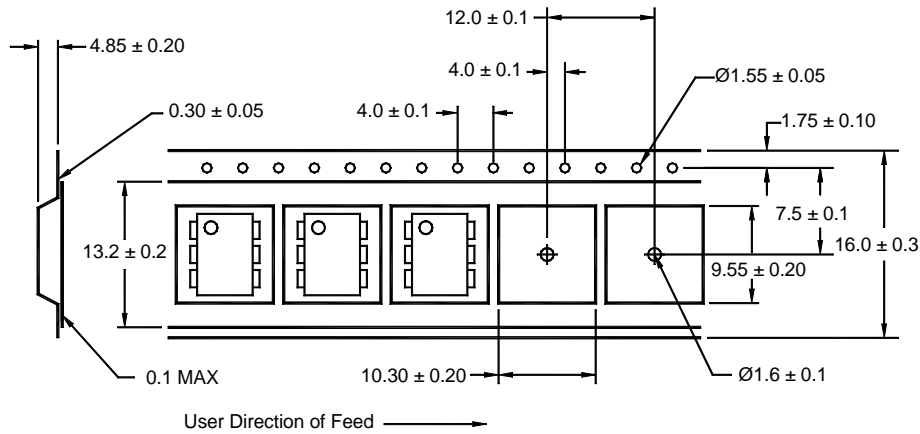
Fig. 6 Turn-Off Time vs. Input Current

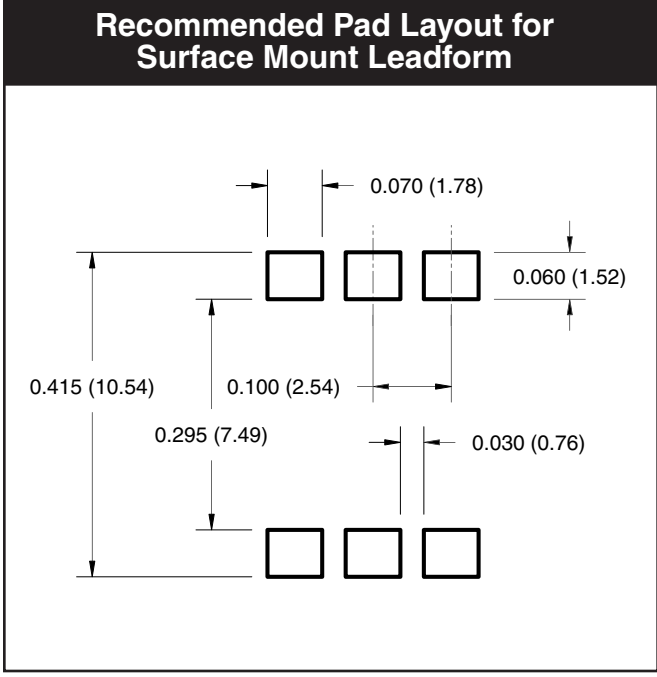


ORDERING INFORMATION

Option	Order Entry Identifier	Description
S	.S	Surface Mount Lead Bend
SD	.SD	Surface Mount; Tape and reel
W	.W	0.4" Lead Spacing
300	.300	VDE 0884
300W	.300W	VDE 0884, 0.4" Lead Spacing
3S	.3S	VDE 0884, Surface Mount
3SD	.3SD	VDE 0884, Surface Mount, Tape & Reel

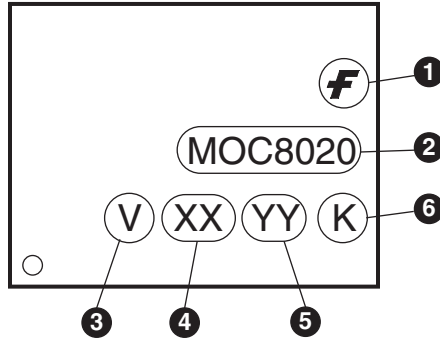
QT Carrier Tape Specifications ("D" Taping Orientation)





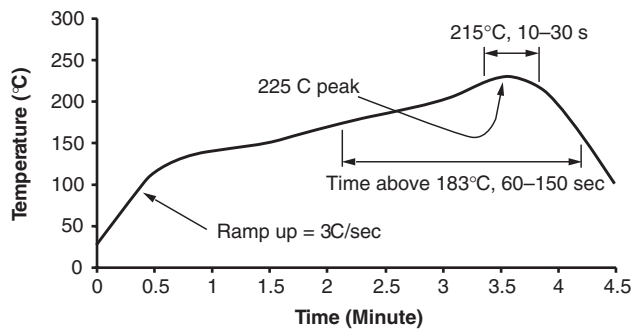
Note
All dimensions are in inches (millimeters)

MARKING INFORMATION



Definitions	
1	Fairchild logo
2	Device number
3	VDE mark (Note: Only appears on parts ordered with VDE option – See order entry table)
4	Two digit year code, e.g., '03'
5	Two digit work week ranging from '01' to '53'
6	Assembly package code

Reflow Profile (Black Package, No Suffix)



- Peak reflow temperature: 225°C (package surface temperature)
- Time of temperature higher than 183°C for 60–150 seconds
- One time soldering reflow is recommended

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CoolFET™	FRFET™	MicroFET™	PowerTrench®	SuperSOT™-6
CROSSVOLT™	GlobalOptoisolator™	MicroPak™	QFET®	SuperSOT™-8
DOMET™	GTO™	MICROWIRE™	QS™	SyncFET™
EcoSPARK™	HiSeC™	MSX™	QT Optoelectronics™	TinyLogic®
E ² CMOS™	μC™	MSXPro™	Quiet Series™	TINYOPTO™
EnSigna™	i-Lo™	OCX™	RapidConfigure™	TruTranslation™
FACT™	ImpliedDisconnect™	OCXPro™	RapidConnect™	UHC™
FACT Quiet Series™		OPTOLOGIC®	μSerDes™	UltraFET®
Across the board. Around the world.™		OPTOPLANAR™	SILENT SWITCHER®	VCX™
The Power Franchise®		PACMAN™	SMART START™	
Programmable Active Droop™		POP™	SPM™	

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PRODUCT STATUS DEFINITIONS

Definition of Terms

Datasheet Identification	Product Status	Definition
Advance Information	Formative or In Design	This datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
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No Identification Needed	Full Production	This datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design.
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