Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Collector-emitter voltage	V_{CEO}	50	V
Output withstand voltage	$V_{CE\ (SUS)}$	50	V
Output current	I_{OUT}	500	mA
Input voltage	V_{IN}	−0.5~30	V
Clamp diode reverse voltage	V_R	50	V
Clamp diode forward current	I_F	500	mA
Power dissipation	P_D (Note 4)	0.78	W
Saturated thermal resistance	$R_{th\ (j\text{-}a)}$ (Note 4)	160	°C/W
	$R_{th\ (j\text{-}c)}$ (Note 5)	25	
Operating temperature	T_{opr}	−40~85	°C
Storage temperature	T_{stg}	−55~150	°C

Note 4: 114.3 × 76.2 × 1.6 mm glass epoxy film substrate Cu heat dissipation pattern 100 mm^2

Note 5: When an infinite heat sink is mounted.

Recommended Operating Condition (Ta = −40~85°C)

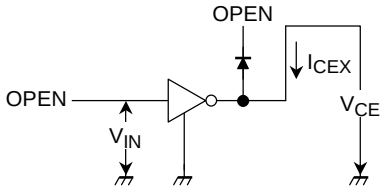
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Output withstand voltage		V_{CEO}	—	0	—	50	V
Output current		I_{OUT}	Ta = 60°C, T_j = 105°C	—	—	220	mA
Input voltage		V_{IN}	—	0	—	24	V
Input voltage	Output ON	$V_{IN\ (ON)}$	I_{OUT} = 400 mA, h_{FE} = 800	2.8	—	24	V
	Output OFF	$V_{IN\ (OFF)}$	—	0	—	0.7	
Clamp diode reverse voltage		V_R	—	—	—	50	V
Clamp diode forward current		I_F	—	—	—	350	mA

Electrical Characteristics (Ta = 25°C)

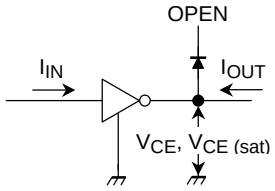
Characteristics		Symbol	Test Circuit	Test Condition		Min	Typ.	Max	Unit
Output leakage current		I_{CEX}	1	V_{CE} = 50 V, V_{IN} = OPEN		—	—	10	μA
Output saturation voltage		$V_{CE\ (sat)}$	2	I_{OUT} = 300 mA, I_{IN} = 500 μA		—	1.1	1.3	V
				I_{OUT} = 200 mA, I_{IN} = 350 μA		—	1.0	1.2	
DC current amplification ratio		h_{FE}	2	V_{CE} = 2.0 V, I_{OUT} = 350 mA		1000	—	—	
Input current	Output ON	$I_{IN\ (ON)}$	3	V_{IN} = 2.4 V, I_{OUT} = 350 mA		—	0.4	0.7	mA
Input voltage	Output ON	$V_{IN\ (ON)}$	4	V_{CE} = 2 V, h_{FE} = 800	I_{OUT} = 350 mA	—	—	2.6	V
	Output ON				I_{OUT} = 200 mA	—	—	2.2	
Clamp diode leakage current		I_R	5	V_R = 50 V		—	—	10	μA
Clamp diode forward voltage		V_F	6	I_F = 350 mA		—	1.6	2.0	V
Turn-on delay		t_{ON}	7	V_{OUT} = 50 V, R_L = 125 Ω, C_L = 15 pF		—	0.02	—	μs
Turn-off delay		t_{OFF}				—	1.0	—	

Test Circuit

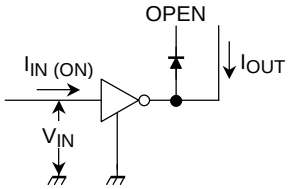
1. I_{CEX}



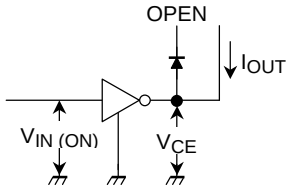
2. $V_{CE\ (sat)}$、h_{FE}



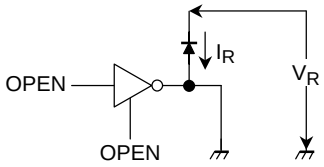
3. $I_{IN\ (ON)}$



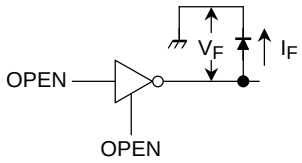
4. $V_{IN\ (ON)}$



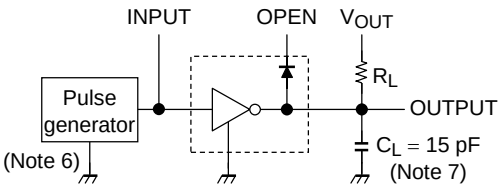
5. I_R

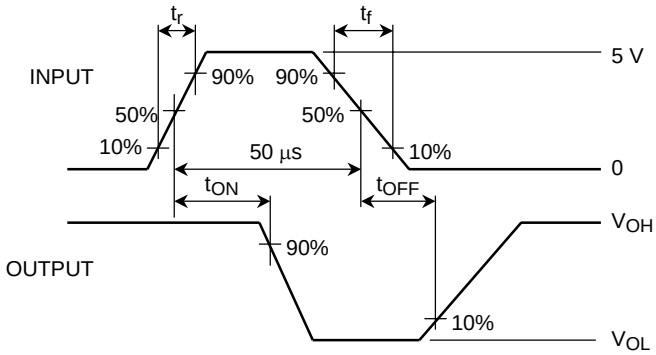


6. V_F



7. t_{ON}, t_{OFF}





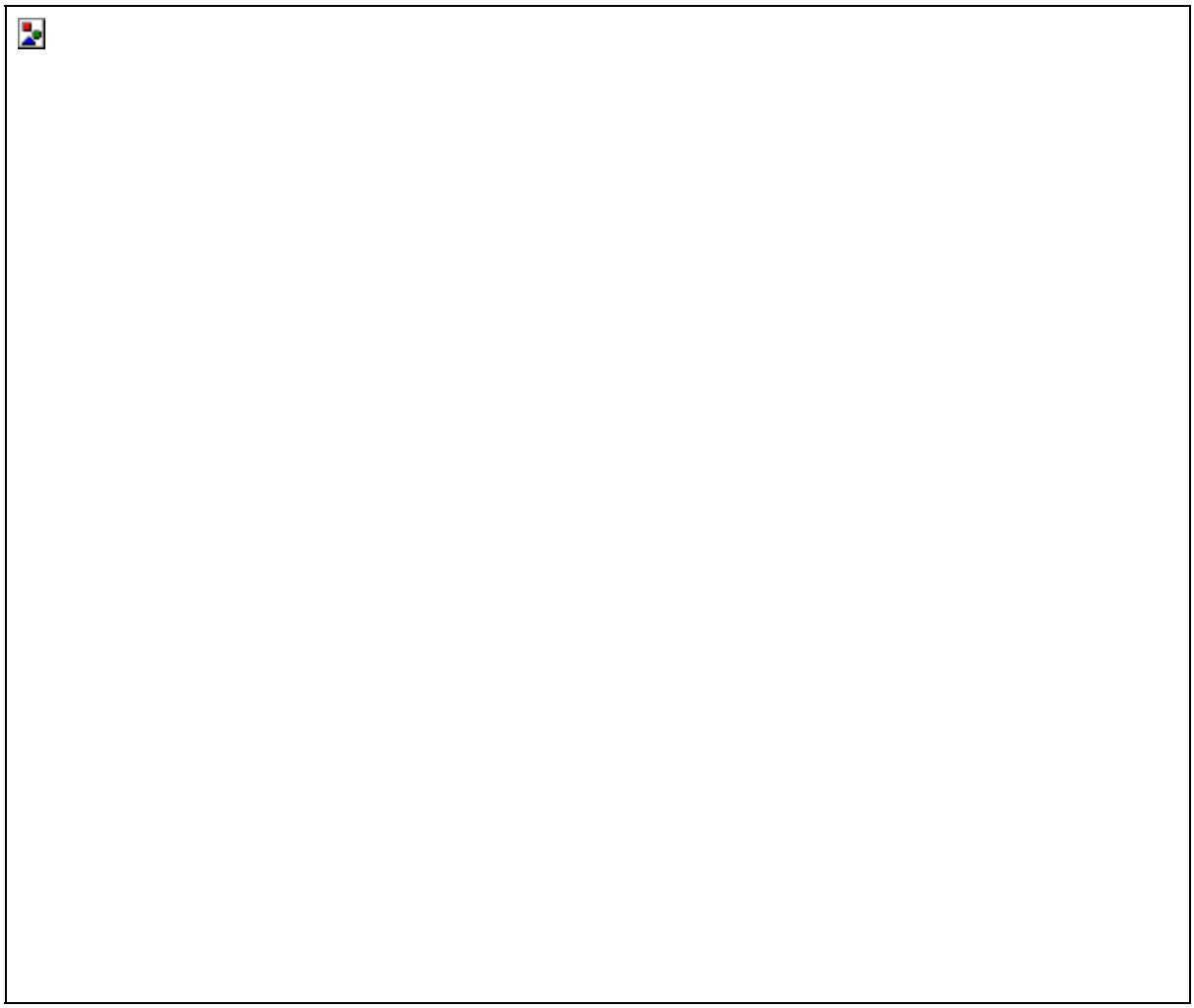
Note 6: Pulse width 50 μs, Duty cycle 10%
Output impedance 50 Ω, $t_r \leqq 5$ ns, $t_f \leqq 10$ ns

Note 7: C_L includes probe and jig capacitance.

Caution on Application

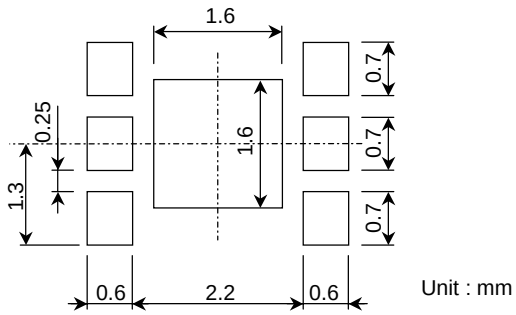
1. The device does not include protectors such as an overcurrent protector and an overvoltage protector. Applying excessive current or voltage may damage the device.
   Thus, design with great care to prevent excessive current or voltage from being applied to the device. The device may also be damaged by short-circuits between outputs and power supply/ground.
   Take care when designing output, V_{CC} and GND line.
2. Be sure to mount the device in the correct orientation. Make sure that the positive and negative power supply pins are connected the right way round. Otherwise, the absolute maximum current and power dissipation ratings may be exceeded and the device may break down or undergo performance degradation, causing it to catch fire or explode, and resulting in injury.

Package Dimensions

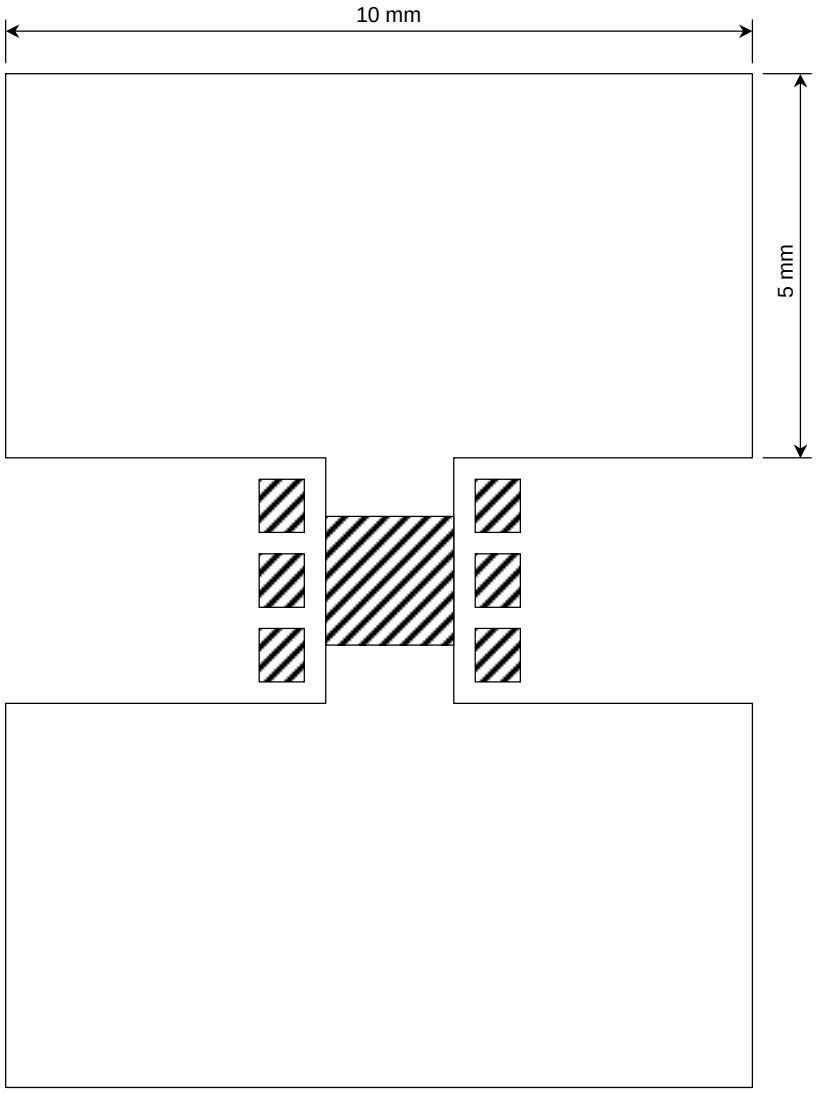


Weight: 0.017 g (typ.)

Preliminary land pattern



Preliminary PCB trace dimension



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