



MPCS-330J Series

SOP16, 1.5A Output Smart Gate Driver Optocoupler

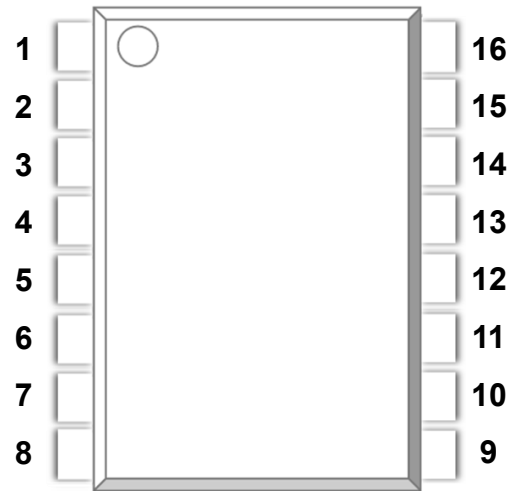
Description

The MPCS-330J is an advanced 1.5 A output current, easy to-use, intelligent gate driver which makes IGBT V_{CE} fault protection compact, affordable, and easy-to implement. Features such as integrated V_{CE} detection, under voltage lockout (UVLO), “soft” IGBT turn-off, isolated open collector fault feedback and active Miller clamping provide maximum design flexibility and circuit protection. The MPCS -330J contains a LED. The LED is optically coupled to an integrated circuit with a power output stage. MPCS -330J is ideally suited for driving power IGBTs and MOSFETs used in motor control inverter applications. The voltage and current supplied by these optocouplers make them ideally suited for directly driving IGBTs with ratings up to 1200 V and 100 A. For IGBTs with higher ratings, the MPCS -330J can be used to drive a discrete power stage which drives the IGBT gate. The MPCS -330J has an insulation voltage of $V_{IORM} = 1414 V_{PEAK}$.

Features

- 1.5 A maximum peak output current
- 1.0 A minimum peak output current
- 250 ns maximum propagation delay over temperature range
- 1.0A Active Miller Clamp. Clamp pin short to V_{EE} if not in used
- Miller Clamping
- Desaturation Detection
- Under Voltage Lock-Out Protection (UVLO) with Hysteresis
- “Soft” IGBT Turn-off

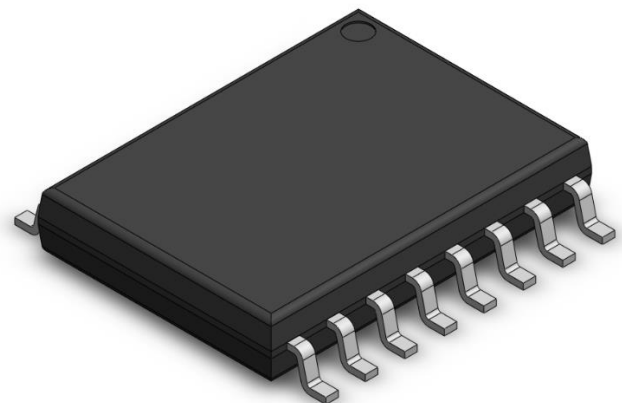
SCHEMATIC



PIN DEFINITION

1. V_S	16. V_E
2. V_{CC1}	15. V_{LED}
3. FAULT	14. DESAT
4. V_S	13. V_{CC2}
5. CATHODE	12. V_{EE}
6. ANODE	11. V_{OUT}
7. ANODE	10. V_{CLAMP}
8. CATHODE	9. V_{EE}

PACKAGE OUTLINE





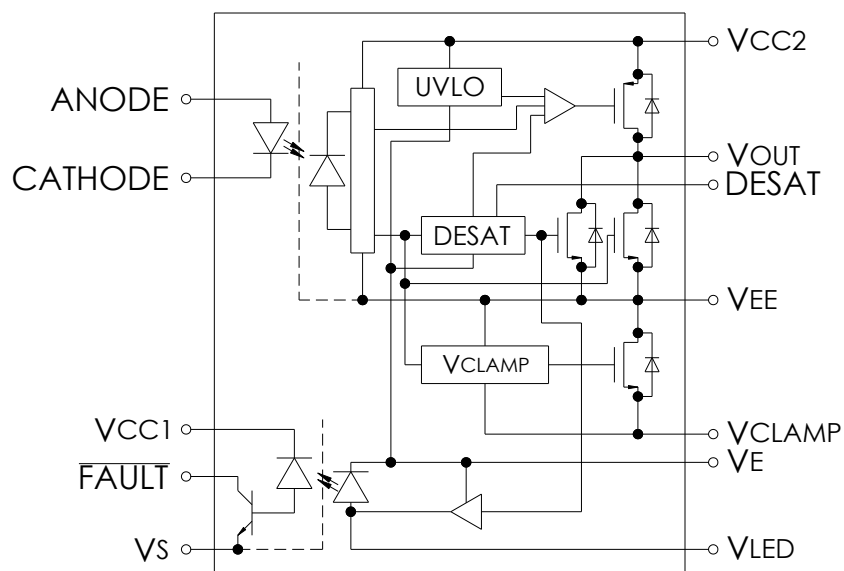
SOP16, 1.5A Output Smart Gate Driver Optocoupler

- Automatic Fault Reset after fixed Mute Time , typically 26 μ s
- Available in SO-16 package
- 100 ns maximum pulse width distortion (PWD)
- 50 kV/ μ s minimum common mode rejection (CMR) at $V_{CM} = 1500$ V
- $I_{CC(max)} < 5$ mA maximum supply current
- Wide V_{CC} operating range: 15 V to 30 V over temperature range
- Wide operating temperature range: -40°C to 110°C
- Regulatory Approvals
 - UL - UL1577
 - VDE - EN60747-5-5(VDE0884-5)
 - CQC – GB4943.1, GB8898

Applications

- Isolated IGBT/Power MOSFET gate drive
- AC and brushless DC motor drives
- Industrial inverters and Uninterruptible Power Supply(UPS)

Internal Circuit





MPCS-330J Series

SOP16, 1.5A Output Smart Gate Driver Optocoupler

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MIN.	MAX.	UNIT	NOTE
Storage Temperature	T_{stg}	-55	125	°C	
Operating Temperature	T_A	-40	110	°C	2
Output IC Junction Temperature	T_J	-	125	°C	2
Average Forward Input Current	I_F	-	20	mA	1
Peak Transient Input Current ($<1 \mu s$ pulse width, 300pps)	$I_{F(TRAN)}$	-	1.0	A	
Reverse Input Voltage	V_R	-	5	V	
“High” Peak Output Current	$I_{OH(PEAK)}$	-	1.5	A	3
“Low” Peak Output Current	$I_{OL(PEAK)}$	-	1.5	A	3
Positive Input Supply Voltage	V_{CC1}	-0.5	7.0	V	
FAULT Output Current	I_{FAULT}	-	8.0	mA	
FAULT Pin Voltage	V_{FAULT}	-0.5	V_{CC1}	V	
Total Output Supply Volta	$(V_{CC2} - V_{EE})$	-0.5	35	V	
Negative Output Supply Voltage	$(V_E - V_{EE})$	-0.5	15	V	6
Positive Output Supply Voltage	$(V_{CC2} - V_E)$	-0.5	$35 - (V_E - V_{EE})$	V	
Gate Drive Output Voltage	$V_{O(PEAK)}$	-0.5	V_{CC2}	V	
Peak Clamping Sinking Current	I_{Clamp}	-	1.0	A	
Miller Clamping Pin Voltage	V_{Clamp}	-0.5	V_{CC2}	V	
DESAT Voltage	V_{DESAT}	V_E	$V_E + 10$	V	
Output IC Power Dissipation	P_O	-	600	mW	2
Input IC Power Dissipation	P_I	-	150	mW	2
Solder Reflow Temperature Profile	See Package Outline Drawings section				

RECOMMENDED OPERATION CONDITIONS

PARAMETER	SYMBOL	MIN.	MAX.	UNIT	Note
Operating Temperature	T_A	-40	110	°C	2
Total Output Supply Voltage	$(V_{CC2} - V_{EE})$	15	30	V	7
Negative Output Supply Voltage	$(V_E - V_{EE})$	0	15	V	4
Positive Output Supply Voltage	$(V_{CC2} - V_E)$	15	$30 - (V_E - V_{EE})$	V	
Input Current (ON)	$I_{F(ON)}$	8	12	mA	
Input Voltage (OFF)	$V_{F(OFF)}$	-3.6	0.8	V	



MPCS-330J Series

SOP16, 1.5A Output Smart Gate Driver Optocoupler

ELECTRICAL OPTICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION	NOTE
INPUT CHARACTERISTICS							
FAULT Logic Low Output Voltage	V_{FAULTL}	-	0.01	0.4	V	$I_{FAULT} = 1.1 \text{ mA}$, $V_{CC1} = 5.5\text{V}$	
		-	0.02	0.4	V	$I_{FAULT} = 1.1 \text{ mA}$, $V_{CC1} = 3.3\text{V}$	
FAULT Logic High Output Current	I_{FAULTH}	-	0.01	0.5	μA	$V_{FAULT} = 5.5 \text{ V}$, $V_{CC1} = 5.5\text{V}$	
		-	0.006	0.3	μA	$V_{FAULT} = 3.3 \text{ V}$, $V_{CC1} = 3.3\text{V}$	
High Level Output Current	I_{OH}	-	-1.0	-0.3	A	$V_O = V_{CC2} - 4$	5
		-	-	-1.0	A	$V_O = V_{CC2} - 15$	3
Low Level Output Current	I_{OL}	0.3	1.0	-	A	$V_O = V_{EE} + 2.5$	5
		1.0	-	-	A	$V_O = V_{EE} + 15$	3
Low Level Output Current During Fault Condition	I_{OLF}	70	110	230	mA	$V_{OUT} - V_{EE} = 14 \text{ V}$	6
High Level Output Voltage	V_{OH}	$V_{CC}-0.5$	$V_{CC}-0.1$	-	V	$I_O = -650 \mu\text{A}$	7,8,9,23
Low Level Output Voltage	V_{OL}	-	0.13	0.5	V	$I_O = 100 \text{ mA}$	
Clamp Pin Threshold Voltage	V_{tClamp}	-	2.2	-	V	-	
Clamp Low Level Sinking Current	I_{CL}	0.21	0.8	-	A	$V_O = V_{EE} + 2.5$	
High Level Supply Current	I_{CC2H}	-	2.16	5	mA	$I_O = 0 \text{ mA}$	9
Low Level Supply Current	I_{CC2L}	-	2.29	5	mA	$I_O = 0 \text{ mA}$	
Blanking Capacitor Charging Current	I_{CHG}	0.13	-0.23	-0.33	mA	$V_{DESAT} = 2 \text{ V}$	9,10
Blanking Capacitor Discharge Current	I_{DSCHG}	10	31	-	mA	$V_{DESAT} = 7.0 \text{ V}$	
DESAT Threshold	V_{DESAT}	6	6.7	7.5	V	$V_{CC2} - V_{E} > V_{UVLO-}$	9
UVLO Threshold	V_{UVLO+}	10.5	11.5	12.5	V	$V_O > 5 \text{ V}$	7,9,11
	V_{UVLO-}	9.2	10.5	11.1	V	$V_O < 5 \text{ V}$	7,9,12
UVLO Hysteresis	$(V_{UVLO+} - V_{UVLO-})$	0.4	1.0	-	V	-	
Threshold Input Current Low to High	I_{FLH}	-	0.33	5	mA	$I_O = 0 \text{ mA}$, $V_O > 5 \text{ V}$	
Threshold Input Voltage High to Low	V_{FHL}	0.8	1.75	-	V	-	
Input Forward Voltage	V_F	1.6	2.0	2.4	V	$I_F = 10 \text{ mA}$	
Input Reverse Breakdown Voltage	BV_R	5	-	-	V	$I_R = 10 \mu\text{A}$	
Input Capacitance	C_{IN}	-	70	-	pF	$f = 1 \text{ MHz}$, $V_F = 0 \text{ V}$	

Unless otherwise noted, all typical values at $T_A = 25^\circ\text{C}$, $V_{CC2} - V_{EE} = 30 \text{ V}$, $V_E - V_{EE} = 0 \text{ V}$;

all Minimum/Maximum specifications are at Recommended Operating Conditions.



MPCS-330J Series

SOP16, 1.5A Output Smart Gate Driver Optocoupler

SWITCHING SPECIFICATION

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION	NOTE
Propagation Delay Time to Output Low Level	t_{PHL}	50	104	250	ns	$R_g = 20\ \Omega$, $C_g = 5\ \text{nF}$, $f = 10\ \text{kHz}$, Duty Cycle = 50%, $I_F = 10\ \text{mA}$, $V_{CC2} = 30\ \text{V}$	
Propagation Delay Time to Output High Level	t_{PLH}	50	77	250	ns		13,15
Pulse Width Distortion	PWD	-100		100	ns		14,17
Propagation Delay Difference Between Any Two Parts	PDD ($t_{PHL} - t_{PLH}$)	-150	-	150	ns		17,16
Rise Time	t_r	-	50	-	ns		
Fall Time	t_f	-	45	-	ns		
DESAT Sense to 90% VO Delay	$t_{DESAT(90\%)}$	-	0.1	0.3	μs	$C_{DESAT} = 100\text{pF}$, $R_F = 2.1\text{k}\Omega$, $R_g = 20\ \Omega$, $C_g = 5\ \text{nF}$, $V_{CC2} = 30\ \text{V}$	19
DESAT Sense to 10% VO Delay	$t_{DESAT(10\%)}$	-	1.1	1.5	μs	$C_{DESAT} = 100\text{pF}$, $R_F = 2.1\text{k}\Omega$, $R_g = 20\ \Omega$, $C_g = 5\ \text{nF}$, $V_{CC2} = 30\ \text{V}$	
DESAT Sense to Low Level FAULT Signal Delay	$t_{DESAT(FAULT)}$	-	0.2	0.5	μs	$C_{DESAT} = 100\ \text{pF}$, $R_F = 2.1\text{k}\Omega$, $C_F = \text{Open}$, $R_g = 20\ \Omega$, $C_g = 5\ \text{nF}$, $V_{CC2} = 30\ \text{V}$	18
		-	0.8	-	μs	$C_{DESAT} = 100\ \text{pF}$, $R_F = 2.1\text{k}\Omega$, $C_F = 1\ \text{nF}$, $R_g = 20\ \Omega$, $C_g = 5\ \text{nF}$, $V_{CC2} = 30\ \text{V}$	
DESAT Sense to DESAT Low Propagation Delay	$t_{DESAT(LOW)}$	-	0.15	-	μs	$C_{DESAT} = 100\text{pF}$, $R_F = 2.1\text{k}\Omega$, $R_g = 20\ \Omega$, $C_g = 5\ \text{nF}$, $V_{CC2} = 30\ \text{V}$	19
DESAT Input Mute	$t_{DESAT(MUTE)}$	15	26	40	μs	$C_{DESAT} = 100\text{pF}$, $R_F = 2.1\text{k}\Omega$, $R_g = 20\ \Omega$, $C_g = 5\ \text{nF}$, $V_{CC1} = 5.5\text{V}$, $V_{CC2} = 30\ \text{V}$	20
Output High Level Common Mode Transient Immunity	$ CMH $	15	-	-	kV/ μs	$T_A = 25^\circ\text{C}$, $I_F = 10\text{mA}$, $V_{CM} = 1500\ \text{V}$, $V_{CC2} = 30\text{V}$, $R_F = 2.1\text{k}\Omega$, $C_F = 15\ \text{pF}$	21
		50	-	-		$T_A = 25^\circ\text{C}$, $I_F = 10\text{mA}$, $V_{CM} = 1500\ \text{V}$, $V_{CC2} = 30\text{V}$, $R_F = 2.1\text{k}\Omega$, $C_F = 1\text{nF}$	21,26
Output Low Level Common Mode Transient Immunity	$ CML $	15	-	-	kV/ μs	$T_A = 25^\circ\text{C}$, $V_F = 0\text{V}$, $V_{CM} = 1500\text{V}$, $V_{CC2} = 30\text{V}$, $R_F = 2.1\text{k}\Omega$, $C_F = 15\ \text{pF}$	22
		50	-	-		$T_A = 25^\circ\text{C}$, $V_F = 0\text{V}$, $V_{CM} = 1500\text{V}$, $V_{CC2} = 30\text{V}$, $R_F = 2.1\text{k}\Omega$, $C_F = 1\text{nF}$	

Unless otherwise noted, all typical values at $T_A = 25^\circ\text{C}$, $V_{CC2} - V_{EE} = 30\ \text{V}$, $V_E - V_{EE} = 0\ \text{V}$; all

Minimum/Maximum specifications are at Recommended Operating Conditions.



MPCS-330J Series

SOP16, 1.5A Output Smart Gate Driver Optocoupler

ISOLATION CHARACTERISTIC

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION	NOTE
Withstand Insulation Test Voltage	V_{ISO}	5000	-	-	V	$RH \leq 40\%-60\%$, $t = 1\text{min}$, $T_A = 25^\circ\text{C}$	24,25
Input-Output Resistance	R_{I-O}	-	10^{12}	-	Ω	$V_{I-O} = 500\text{V DC}$	25

Note1: Derate linearly above 70°C free air temperature at a rate of $0.3\text{ mA}/^\circ\text{C}$.

Note2: In order to achieve the absolute maximum power dissipation specified, pins 4, 9, and 10 require ground plane connections and may require airflow. See the Thermal Model section in the application notes at the end of this data sheet for details on how to estimate junction temperature and power dissipation. In most cases the absolute maximum output IC junction temperature is the limiting factor. The actual power dissipation achievable will depend on the application environment (PCB Layout, air flow, part placement, etc.). See the Recommended PCB Layout section in the application notes for layout considerations. Output IC power dissipation is derated linearly at $10\text{ mW}/^\circ\text{C}$ above 90°C . Input IC power dissipation does not require derating.

Note3: Maximum pulse width = $10\text{ }\mu\text{s}$. This value is intended to allow for component tolerances for designs with IO peak minimum = 1.0 A . Derate linearly from 2.0 A at $+25^\circ\text{C}$ to 1.5 A at $+105^\circ\text{C}$. This compensates for increased I_{OPEAK} due to changes in V_{OL} over temperature.

Note4: This supply is optional. Required only when negative gate drive is implemented.

Note5: Maximum pulse width = $50\text{ }\mu\text{s}$.

Note6: See the Slow IGBT Gate Discharge During Fault Condition section in the applications notes at the end of this data sheet for further details.

Note7: 15 V is the recommended minimum operating positive supply voltage ($V_{CC2} - V_E$) to ensure adequate margin in excess of the maximum V_{UVLO+} threshold of 12.5 V . For High Level Output Voltage testing, V_{OH} is measured with a dc load current. When driving capacitive loads, V_{OH} will approach V_{CC} as I_{OH} approaches zero units.

Note8: Maximum pulse width = 1.0 ms .

Note9: Once V_O of the MPCS-330J is allowed to go high ($V_{CC2} - V_E > V_{UVLO+}$), the DESAT detection feature of the MPCS-330J will be the primary source of IGBT protection. U_{VLO} is needed to ensure DESAT is functional. Once V_{CC2} is increased from 0V to above V_{UVLO+} , DESAT will remain functional until V_{CC2} is decreased below V_{UVLO-} . Thus, the DESAT detection and U_{VLO} features of the MPCS-330J work in conjunction to ensure constant IGBT protection.

Note10: See the DESAT fault detection blanking time section in the applications notes at the end of this data sheet for further details.

Note11: This is the "increasing" (i.e. turn-on or "positive going" direction) of $V_{CC2} - V_E$

Note12: This is the "decreasing" (i.e. turn-off or "negative going" direction) of $V_{CC2} - V_E$



Note13: This load condition approximates the gate load of a 1200 V/75A IGBT.

Note14: Pulse Width Distortion (PWD) is defined as $|t_{PHL} - t_{PLH}|$ for any given unit.

Note15: As measured from I_F to V_O .

Note16: The difference between t_{PHL} and t_{PLH} between any two MPCS-330J parts under the same test conditions.

Note17: As measured from ANODE, CATHODE of LED to V_{OUT} .

Note18: This is the amount of time from when the DESAT threshold is exceeded, until the FAULT output goes low.

Note19: This is the amount of time the DESAT threshold must be exceeded before V_{OUT} begins to go low, and the FAULT output to go low. This is supply voltage dependent.

Note20: Auto Reset: This is the amount of time when V_{OUT} will be asserted low after DESAT threshold is exceeded. See the Description of Operation (Auto Reset) topic in the application information section.

Note21: Common mode transient immunity in the high state is the maximum tolerable dV_{CM}/dt of the common mode pulse, V_{CM} , to assure that the output will remain in the high state (i.e., $V_O > 15\text{ V}$ or FAULT $> 2\text{ V}$).

Note22: Common mode transient immunity in the low state is the maximum tolerable dV_{CM}/dt of the common mode pulse, V_{CM} , to assure that the output will remain in a low state (i.e., $V_O < 1.0\text{ V}$ or FAULT $< 0.8\text{ V}$).

Note23: To clamp the output voltage at $V_{CC} - 3 V_{BE}$, a pull-down resistor between the output and VEE is recommended to sink a static current of 650 μA while the output is high. See the Output Pull-Down Resistor section in the application notes at the end of this data sheet if an output pull-down resistor is not used.

Note24: In accordance with UL 1577, each optocoupler is proof tested by applying an insulation test voltage $\geq 6000\text{ Vrms}$ for 1 second. This test is performed before the 100% production test for partial discharge (method b) shown in IEC/EN/DIN EN 60747-5-5 Insulation Characteristic Table.

Note25: This is a two-terminal measurement: pins 1-8 are shorted together and pins 9-16 are shorted together.

Note26: Split resistors network with a ratio of 1:1 is needed at input LED1.



MPCS-330J Series

SOP16, 1.5A Output Smart Gate Driver Optocoupler

TYPICAL PERFORMANCE CURVES & TEST CIRCUITS

Fig.1 V_{OH} vs. Temperature

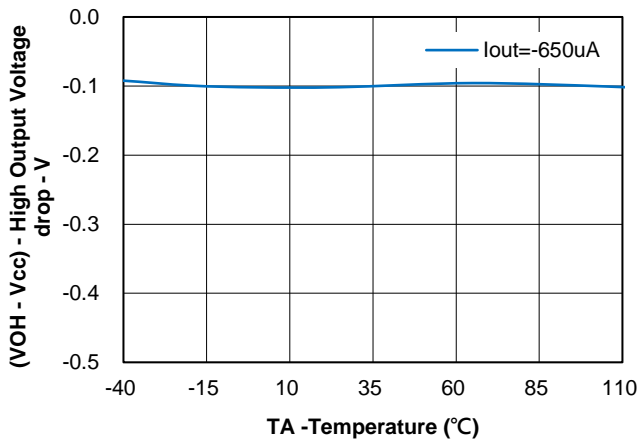


Fig.2 V_{OL} vs. Temperature

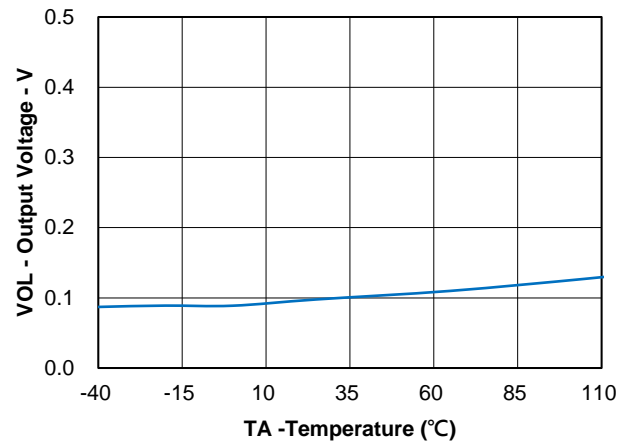


Fig.3 V_{OH} vs. I_{OH}

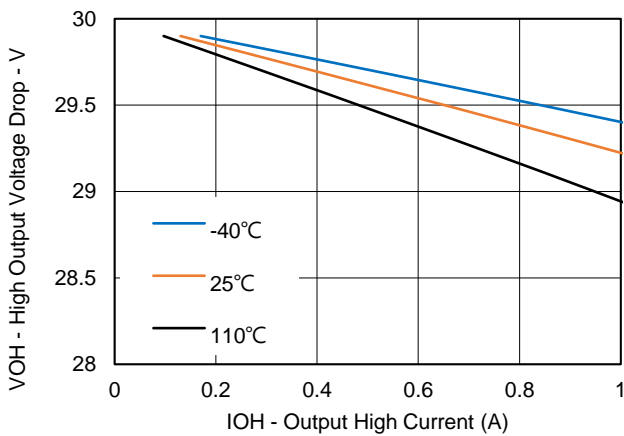


Fig.4 V_{OL} vs. I_{OL}

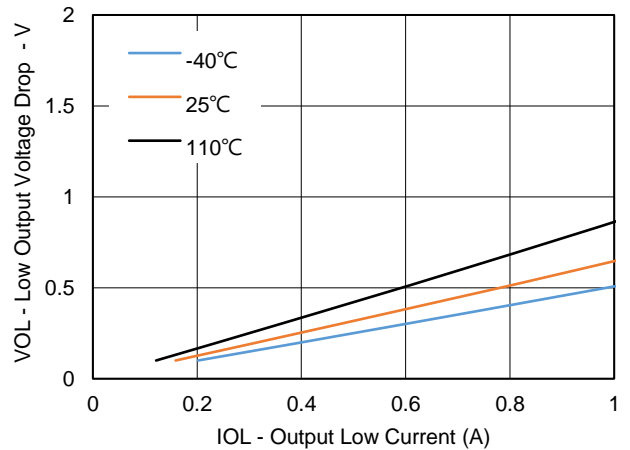


Fig.5 I_{CL} vs. Temperature

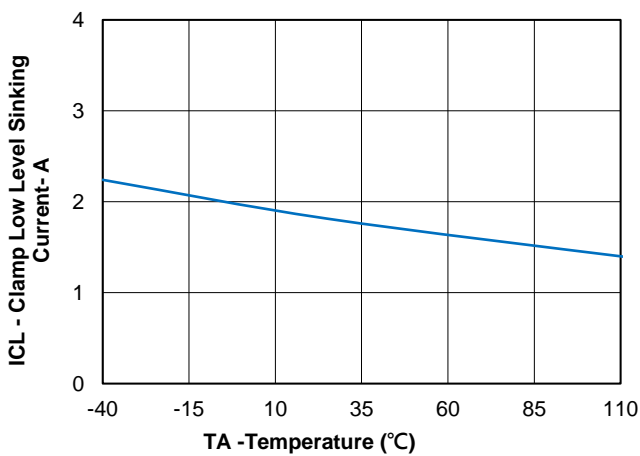
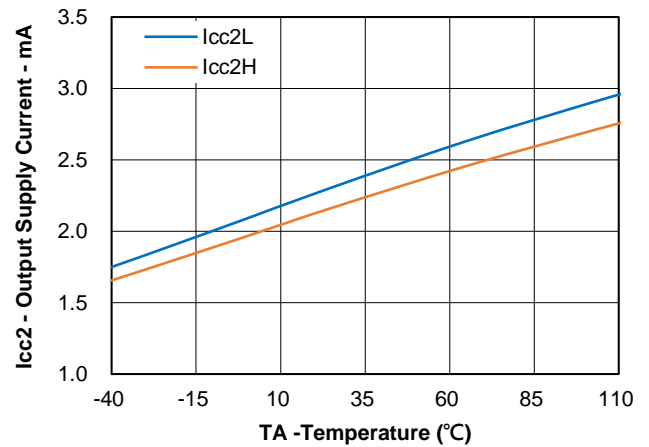


Fig.6 I_{CC2} vs. Temperature





MPCS-330J Series

SOP16, 1.5A Output Smart Gate Driver Optocoupler

Fig.7 I_{CC2} vs. V_{CC2}

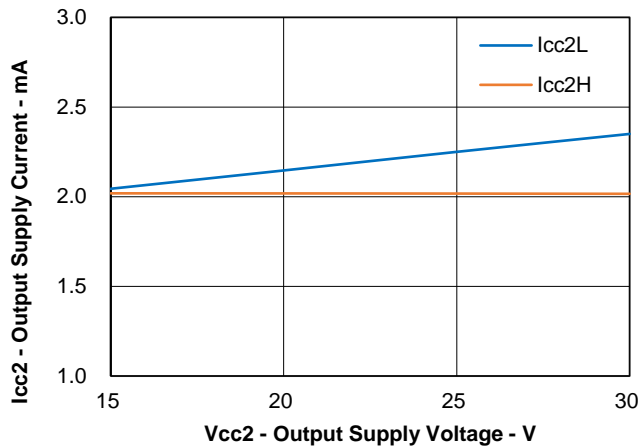


Fig.8 I_{CHG} vs. Temperature

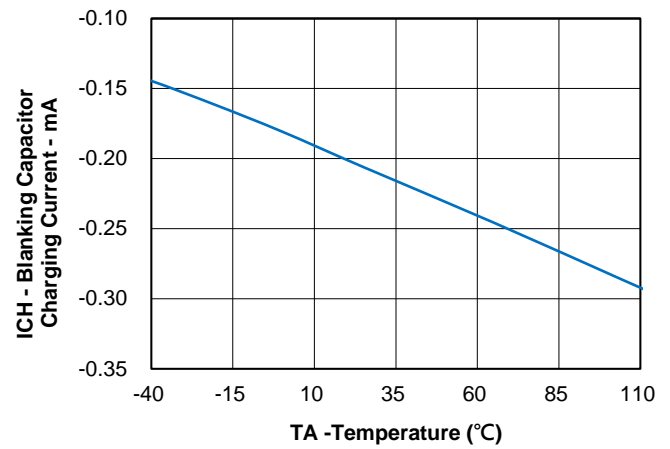


Fig.9 DESAT Threshold vs. Temperature

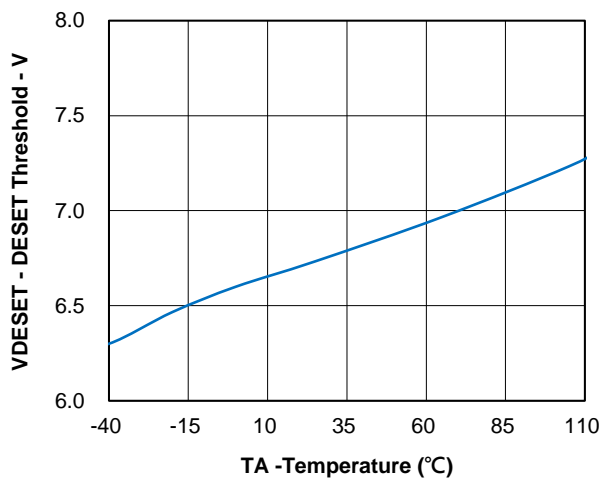


Fig.10 Propagation Delay vs. Temperature

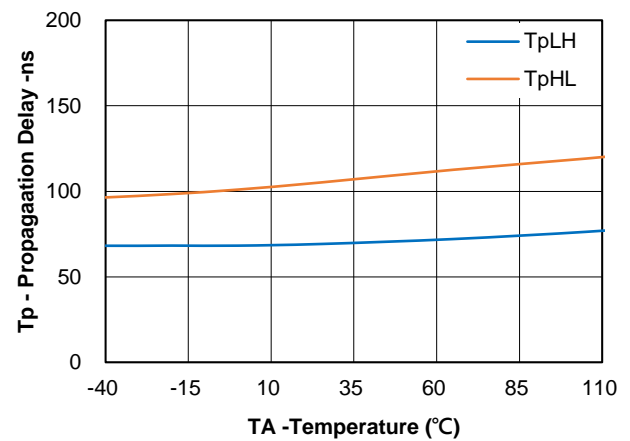


Fig.11 Propagation Delay vs. Supply Voltage

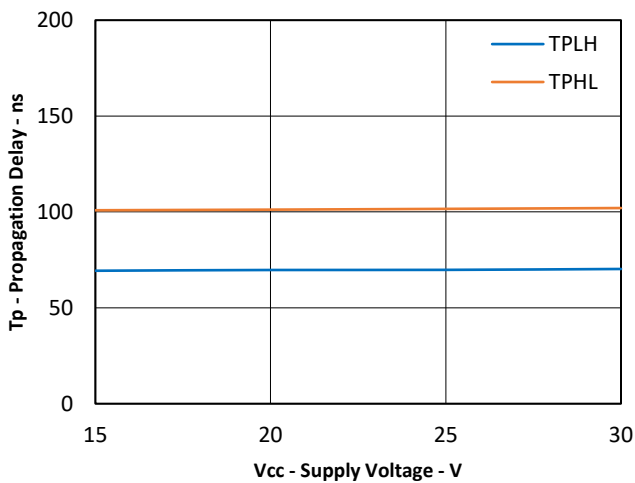
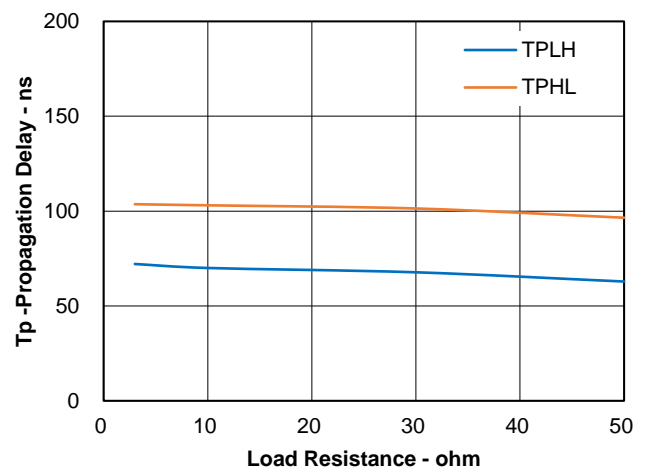


Fig.12 Propagation Delay vs. R_L





MPCS-330J Series

SOP16, 1.5A Output Smart Gate Driver Optocoupler

Fig.13 Propagation Delay vs. C_L

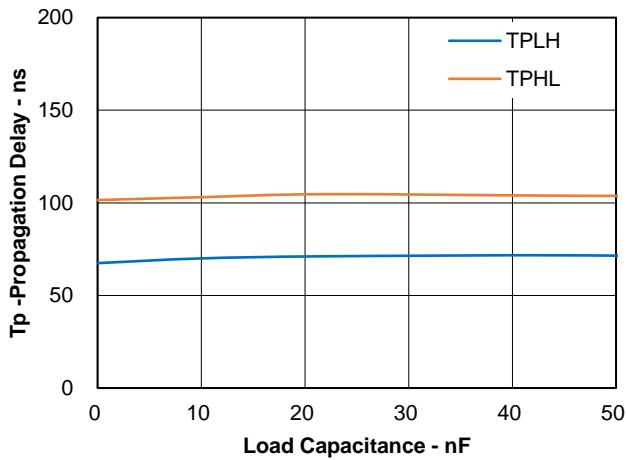


Fig.14 T_{DESAT} 90% vs. Temperature

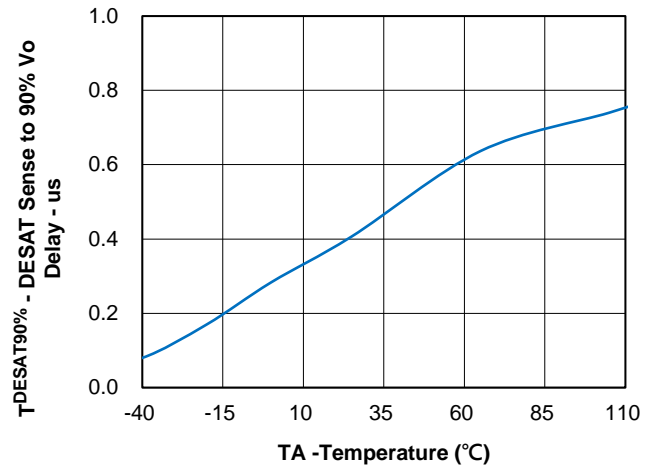


Fig.15 T_{DESAT} 10% vs. Temperature

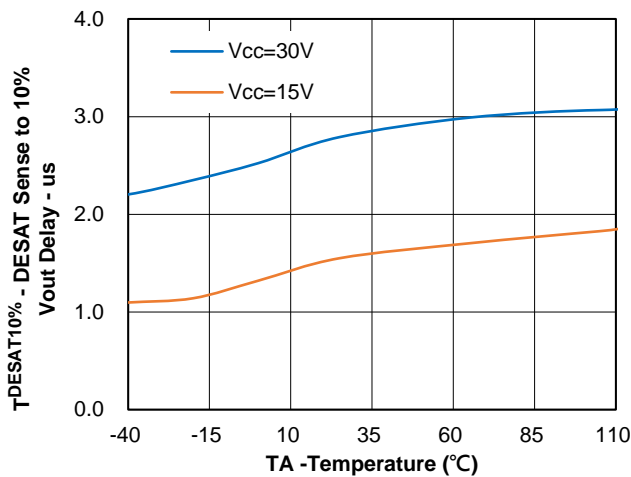


Fig.16 T_{DESAT} 10% vs. R_L

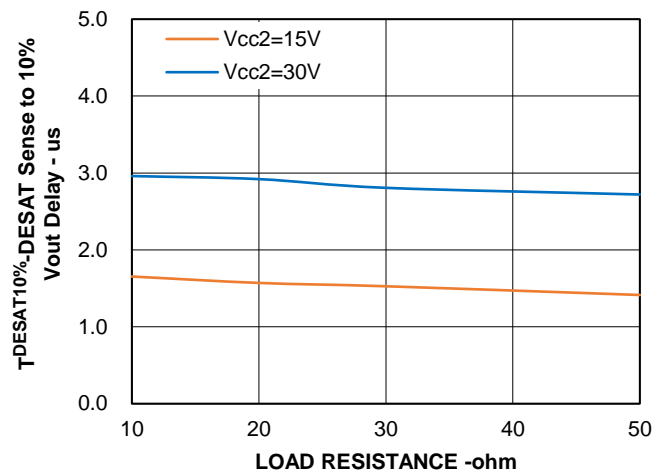


Fig.17 T_{DESAT} 10% vs. C_L

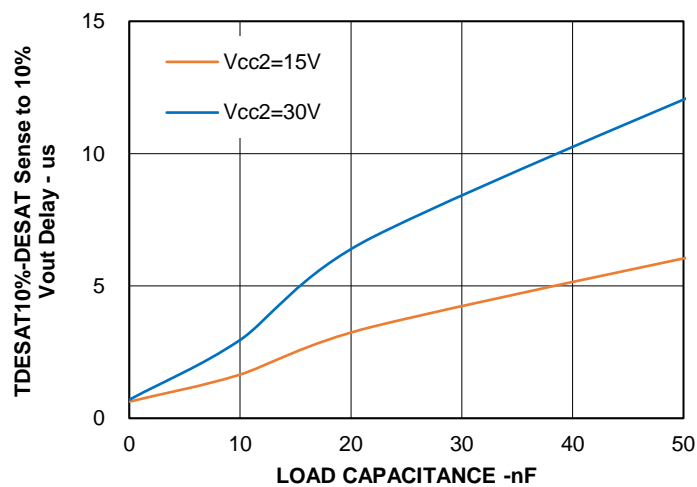


Fig.18 I_{OH} Pulsed Test Circuit

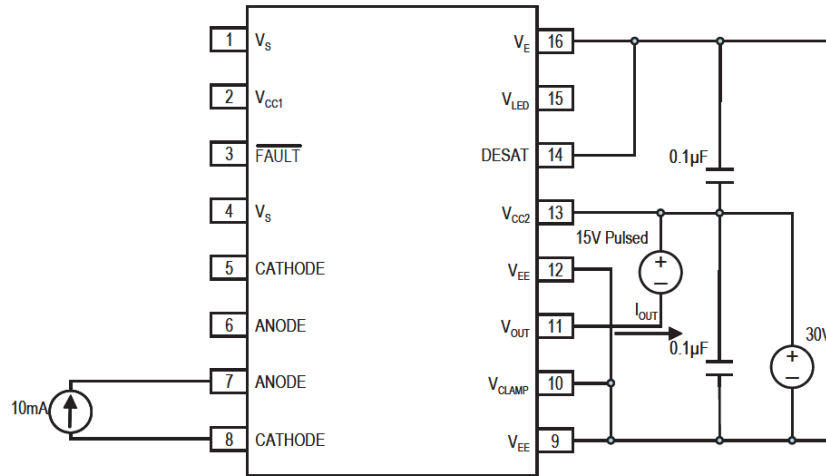


Fig.19 I_{OL} Pulsed Test Circuit

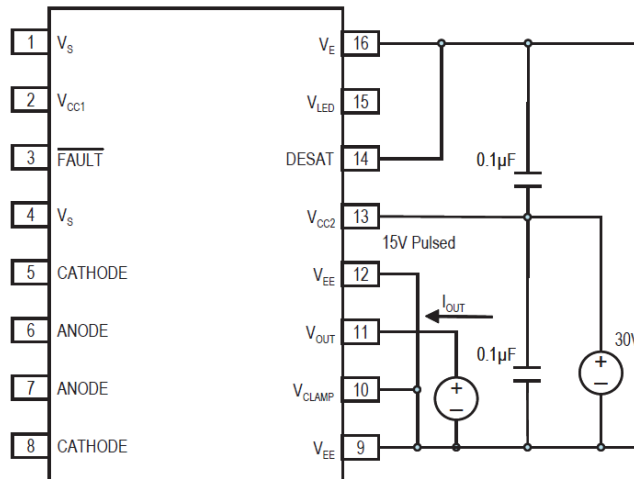


Fig.20 V_{OH} Pulsed Test Circuit

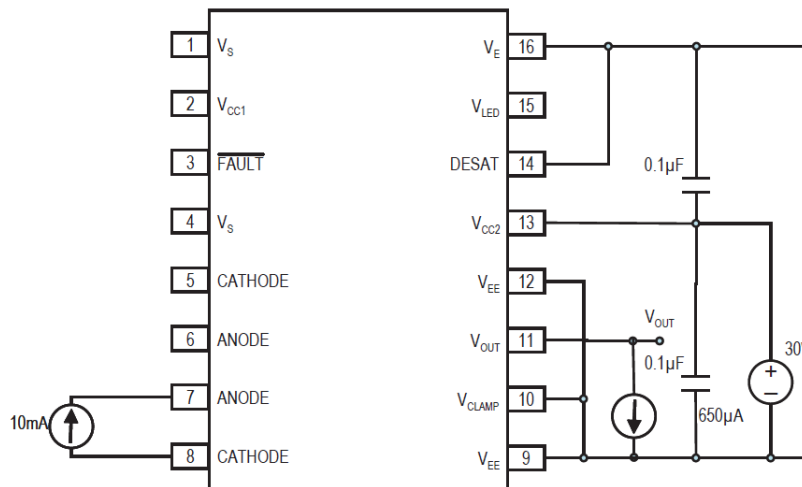


Fig.21 V_{OL} Pulsed Test Circuit

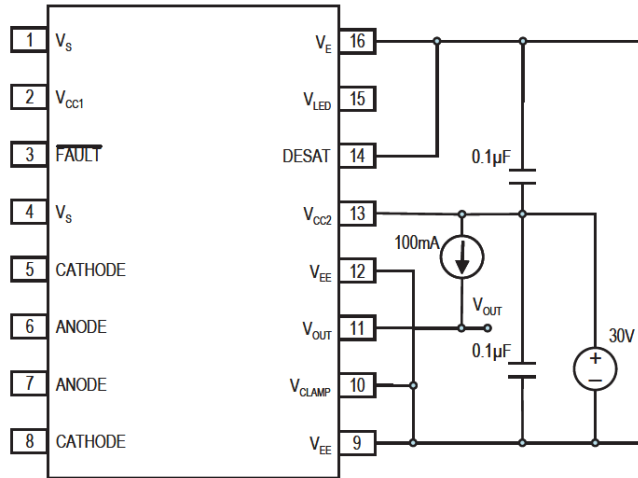


Fig.22 I_{CC2H} Test Circuit

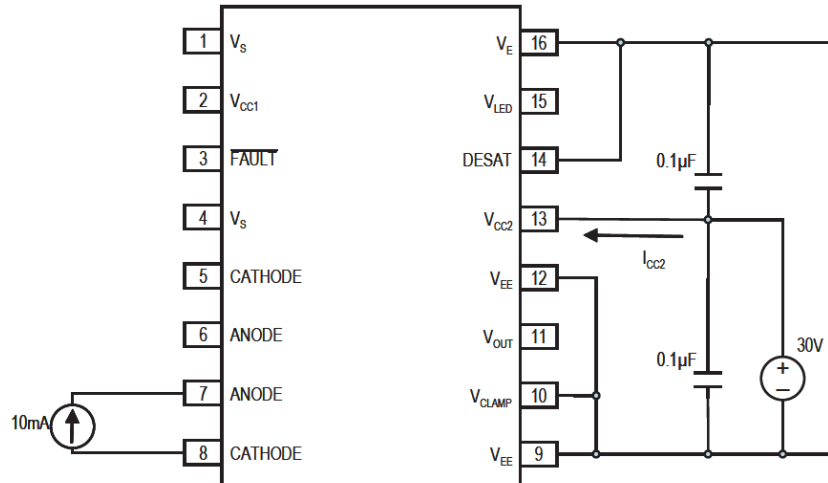


Fig.23 I_{CC2L} Test Circuit

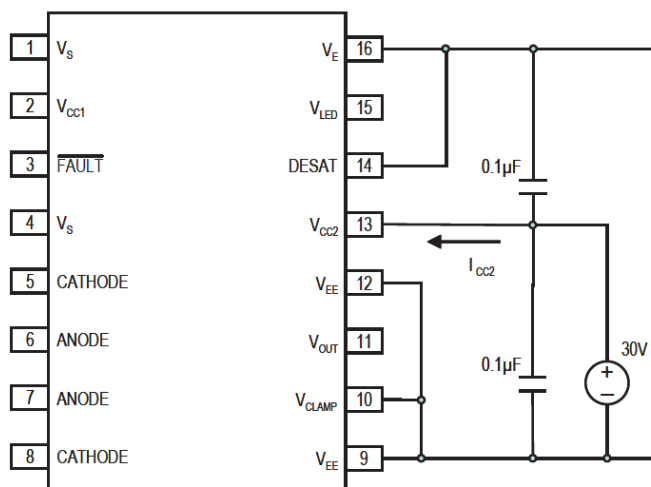


Fig.24 I_{CHG} Pulsed Test Circuit

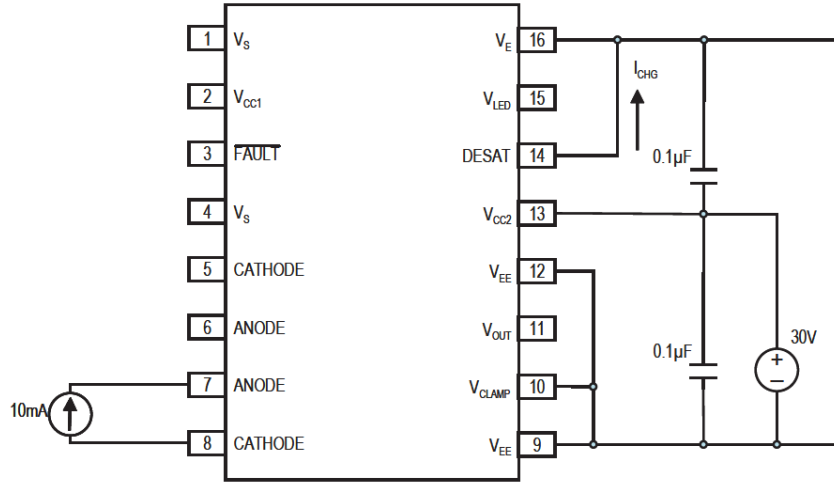


Fig.25 I_{DSCHG} Test Circuit

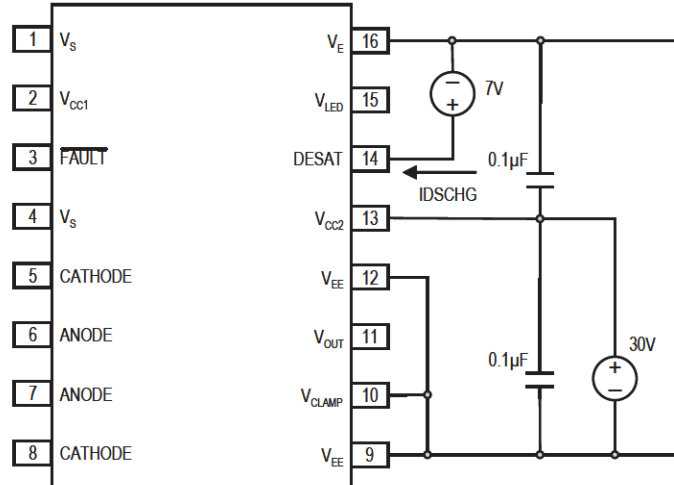


Fig.26 t_{PLH} , t_{PHL} , t_r , t_f Test Circuit

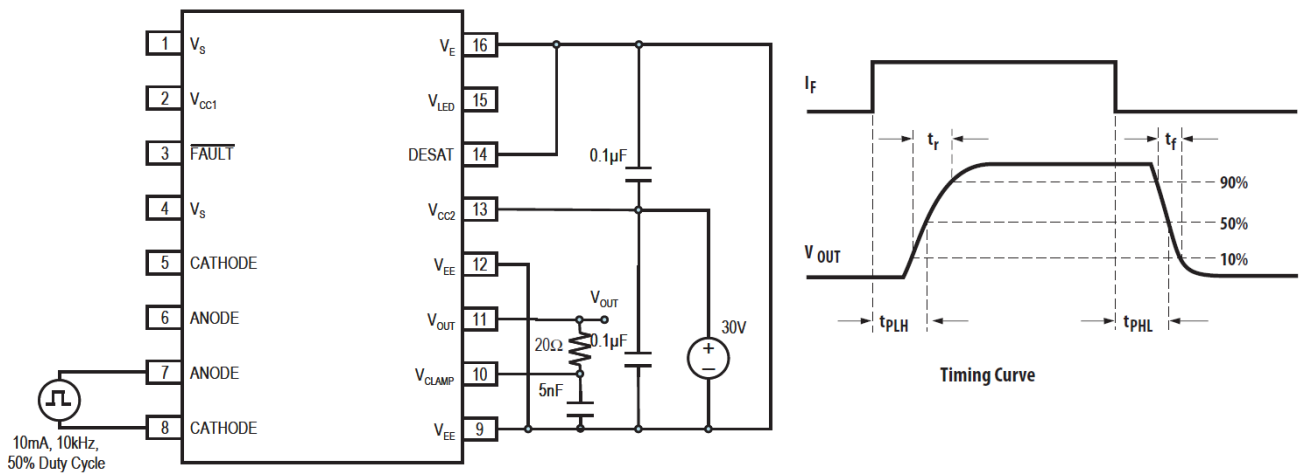
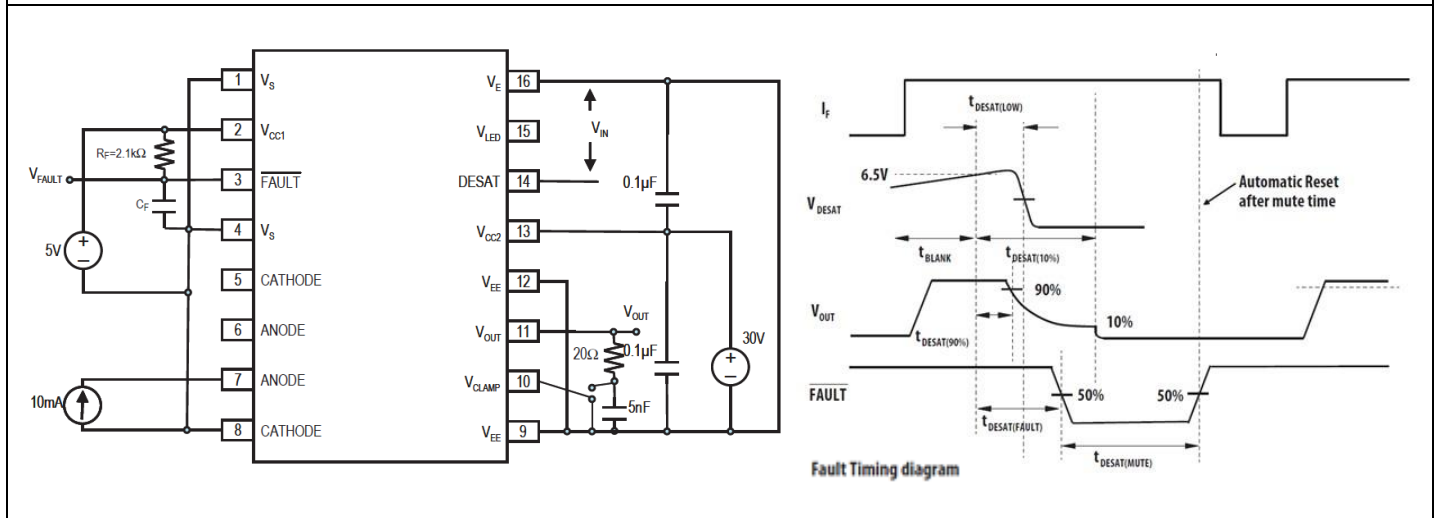


Fig.27 t_{DESAT} Fault Test Circuit

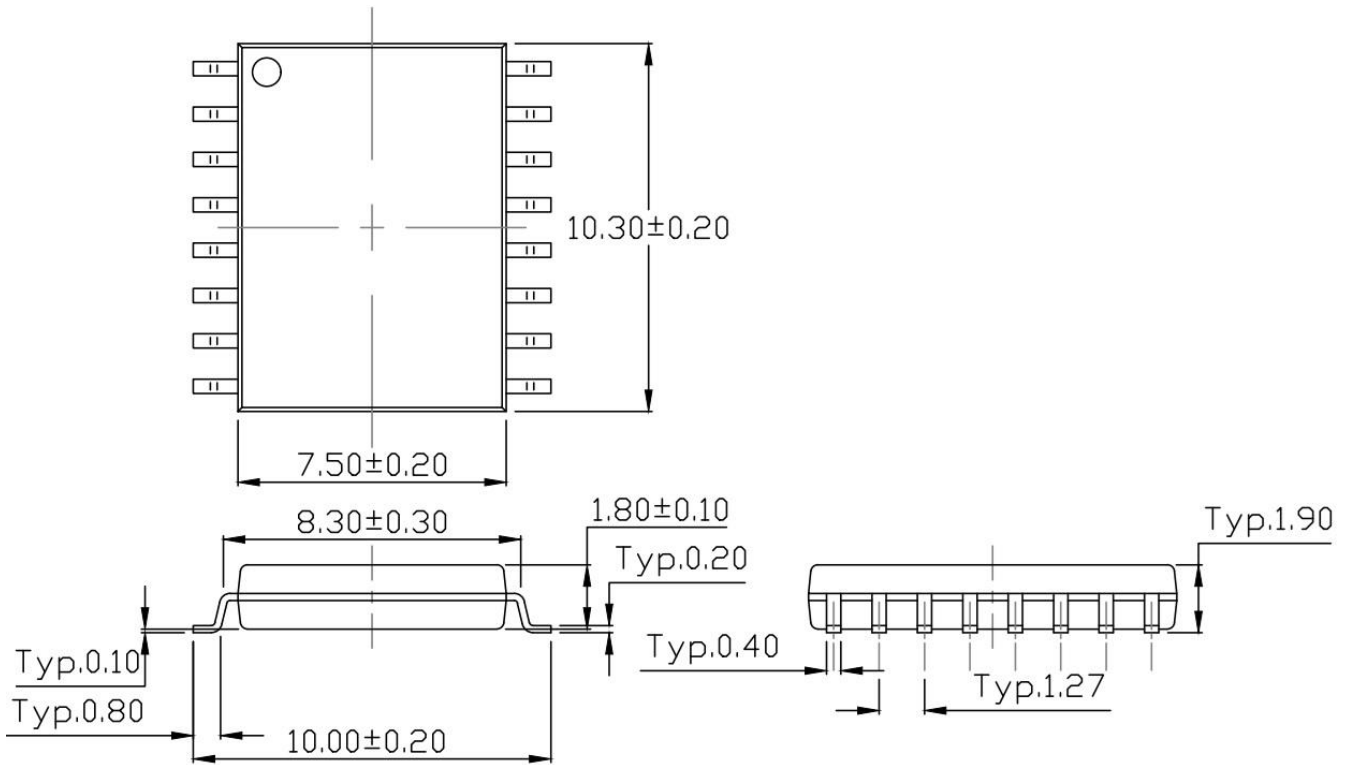




MPCS-330J Series

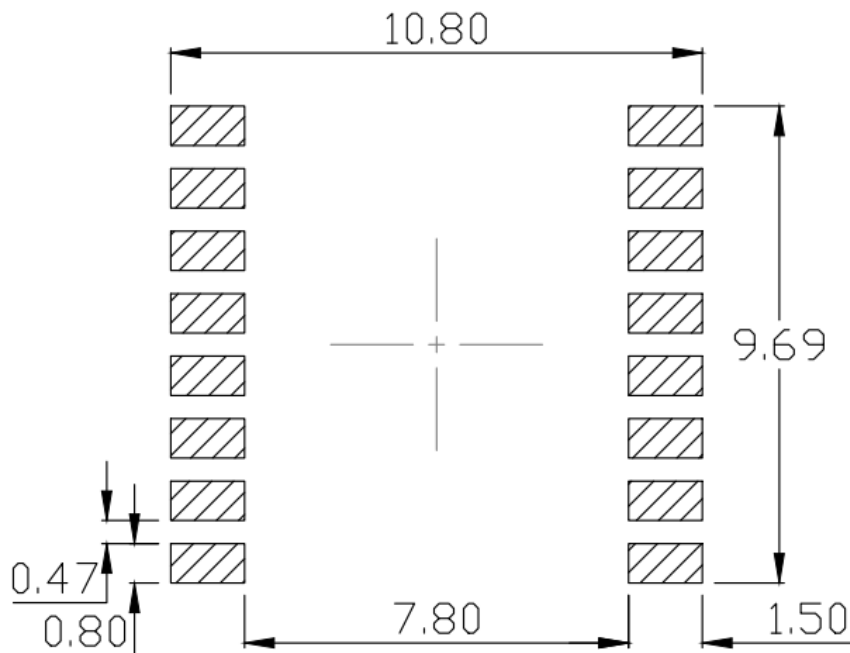
SOP16, 1.5A Output Smart Gate Driver Optocoupler

PACKAGE DIMENSIONS (Dimensions in mm unless otherwise stated)



General Tolerance: ± 0.25 mm

RECOMMENDED SOLDER MASK (Dimensions in mm unless otherwise stated)



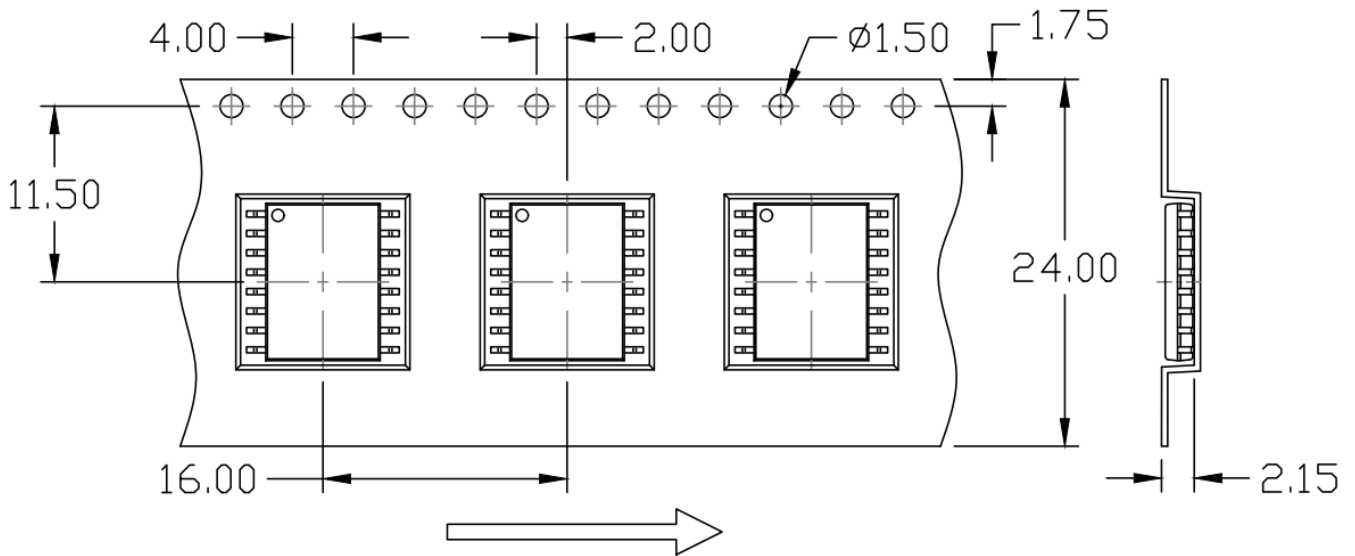


MPCS-330J Series

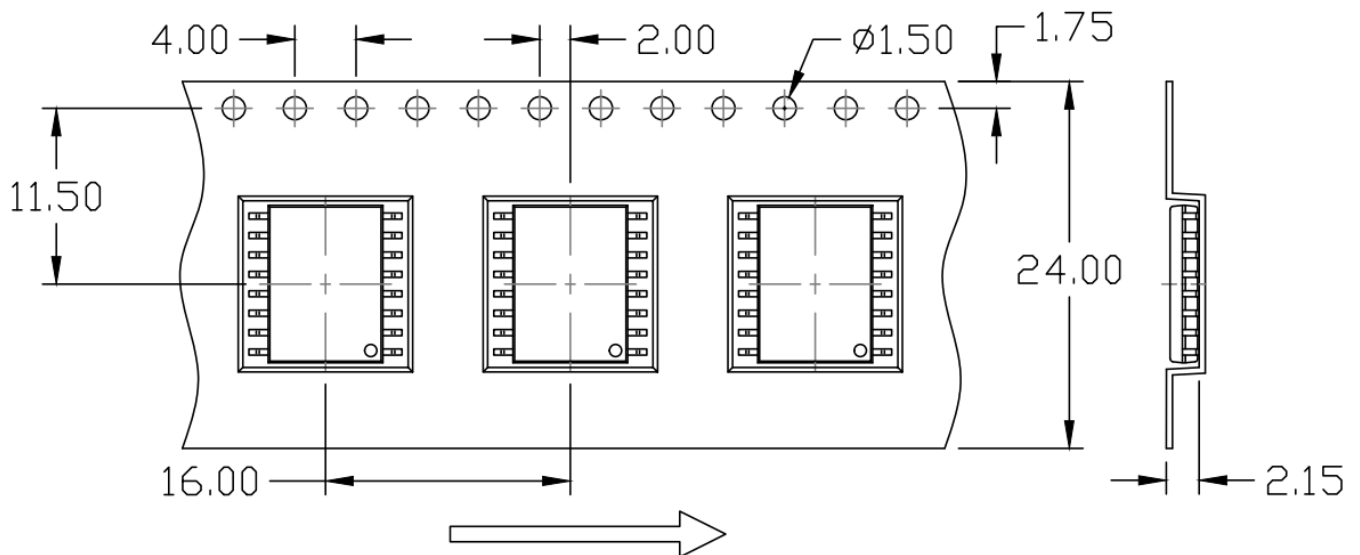
SOP16, 1.5A Output Smart Gate Driver Optocoupler

CARRIER TAPE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Option T1

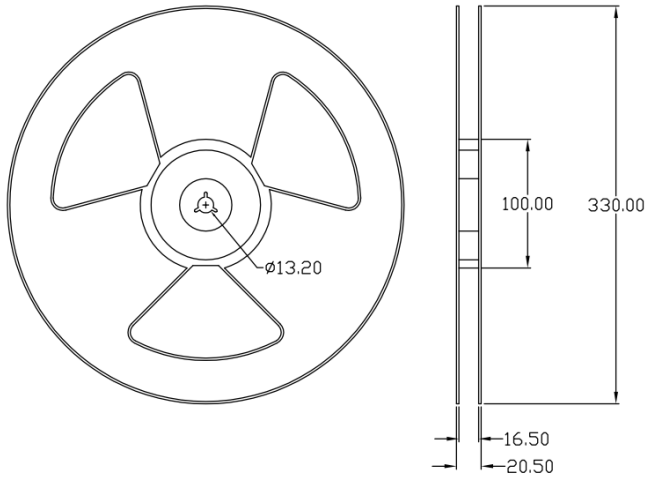


Option T2

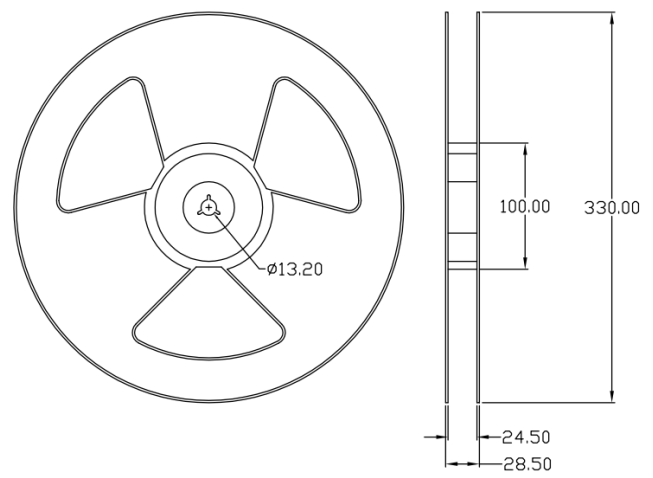


REEL SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Surface Mount Lead Forming (P Type)

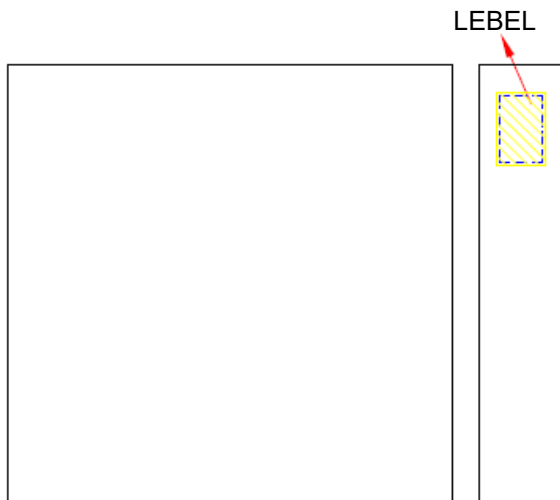


Surface Mount (Gullwing) Lead Forming (W Type)



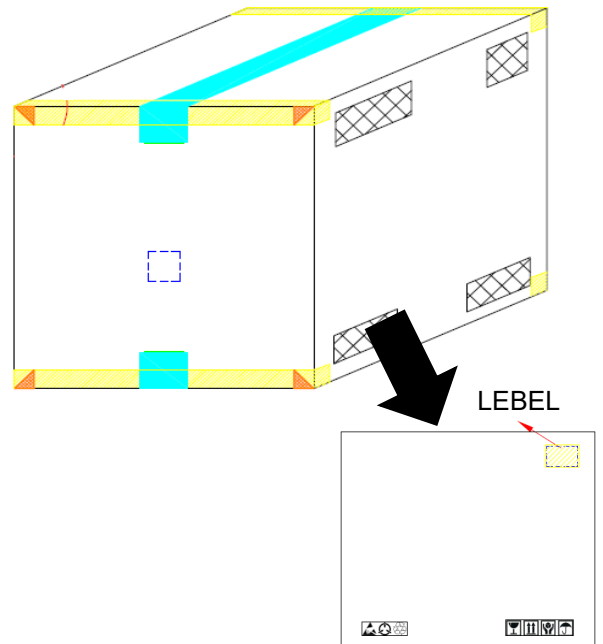
BOX SPECIFICATIONS (Reel Type)

INNER BOX



L x W x H = 36cm x 36cm x 6.9cm

OUTER BOX



L x W x H = 45cm x 38cm x 38cm

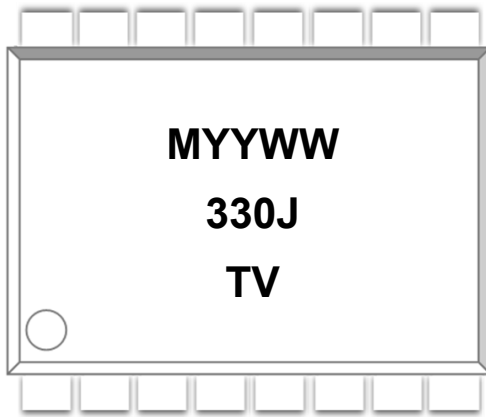


MPCS-330J Series

SOP16, 1.5A Output Smart Gate Driver Optocoupler

ORDERING AND MARKING INFORMATION

MARKING INFORMATION



M : Company Abbr.
YY : Year date code
WW : 2-digit work week
330J : Part Number
T or H : Factory identification mark
V : VDE Identification(Optional)

ORDERING INFORMATION

MPCS-330J-ZV

MPC – Company Abbr.
S – Stack
330J – Part Number
Z – Tape and Reel Option (T1/T2)
V –VDE Option (V or None)

LABEL INFORMATION



喆光照明光電股份有限公司
WISELITE Optronics Co., Ltd

Part No : XXXXXXXXXXXXX

Bin Code : X



Lot No : XXXXXXXXXXXX

Date Code : XXXX

Q'ty : XXXX pcs

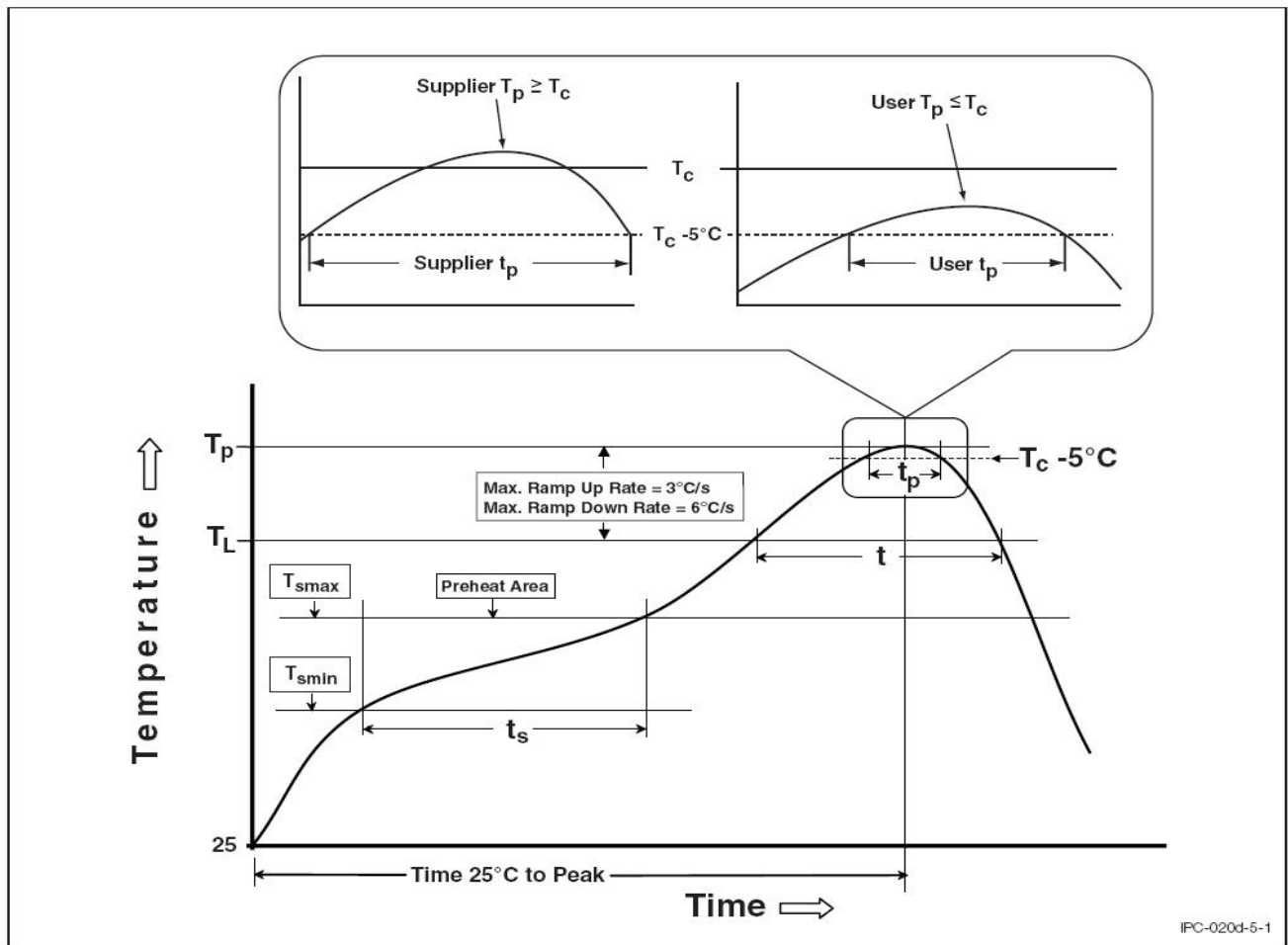


PACKING QUANTITY

Option	Quantity	Quantity – Inner box	Quantity – Outer box
T1/T2	1000 Units/Reel	2 Reels/Inner box	5 Inner box/Outer box = 10k Units

REFLOW INFORMATION

REFLOW PROFILE

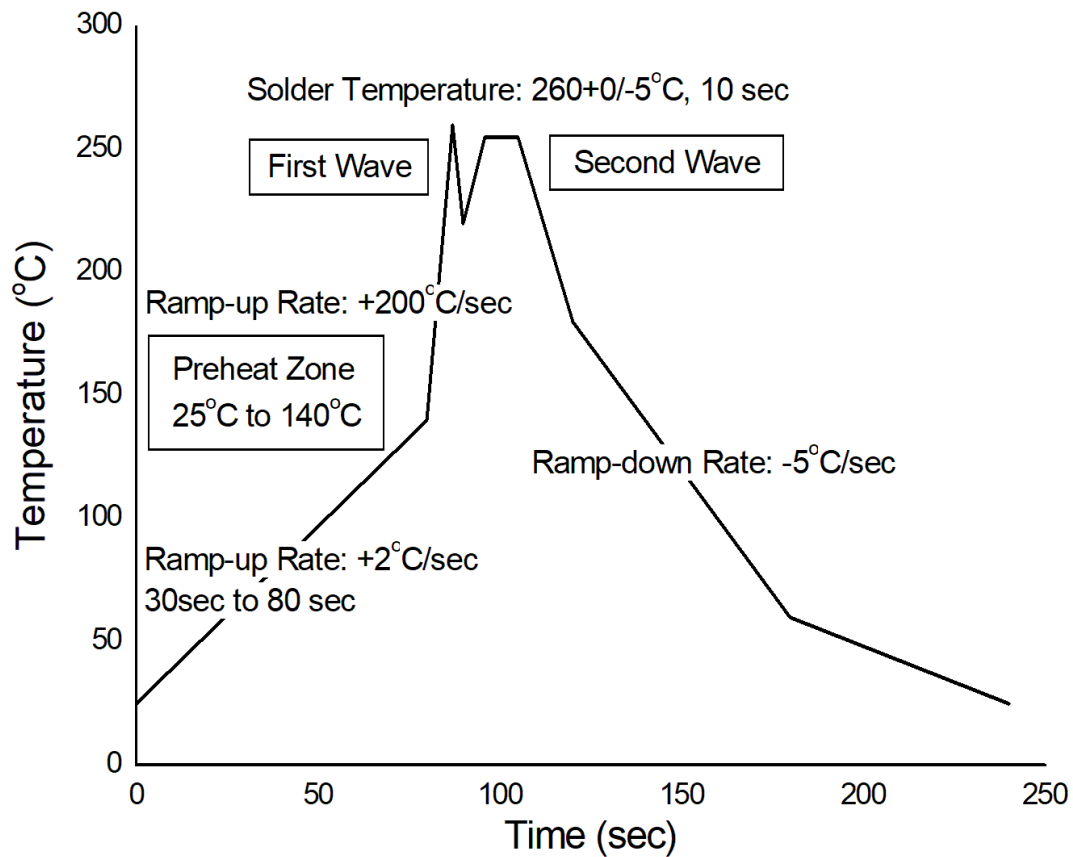


Profile Feature	Sn-Pb Assembly Profile	Pb-Free Assembly Profile
Temperature Min. (T _{smin})	100°C	150°C
Temperature Max. (T _{smax})	150°C	200°C
Time (t _s) from (T _{smin} to T _{smax})	60-120 seconds	60-120 seconds
Ramp-up Rate (t _L to t _P)	3°C/second max.	3°C/second max.
Liquidous Temperature (T _L)	183°C	217°C
Time (t _L) Maintained Above (T _L)	60 – 150 seconds	60 – 150 seconds
Peak Body Package Temperature	235°C +0°C / -5°C	260°C +0°C / -5°C
Time (t _P) within 5°C of 260°C	20 seconds	30 seconds
Ramp-down Rate (T _P to T _L)	6°C/second max	6°C/second max
Time 25°C to Peak Temperature	6 minutes max.	8 minutes max.



TEMPERATURE PROFILE OF SOLDERING

WAVE SOLDERING (JESD22-A111 COMPLIANT)



HAND SOLDERING BY SOLDERING IRON

Soldering Temperature	380+0/-5°C
Soldering Time	3 sec max.

One time soldering is recommended for all soldering method.

Do not solder more than three times for IR reflow soldering.



DISCLAIMER

- WISELITE is continually improving the quality, reliability, function and design. WISELITE reserves the right to make changes without further notices.
- The characteristic curves shown in this datasheet are representing typical performance which are not guaranteed.
- WISELITE makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, WISELITE disclaims (a) any and all liability arising out of the application or use of any product, (b) any and all liability, including without limitation special, consequential or incidental damages, and (c) any and all implied warranties, including warranties of fitness for particular.
- The products shown in this publication are designed for the general use in electronic applications such as office automation, equipment, communications devices, audio/visual equipment, electrical application and instrumentation purpose, non-infringement and merchantability.
- This product is not intended to be used for military, aircraft, medical, life sustaining or lifesaving applications or any other application which can result in human injury or death.
- Please contact WISELITE sales agent for special application request.
- Immerge unit's body in solder paste is not recommended.
- Parameters provided in datasheets may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated in each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify WISELITE's terms and conditions of purchase, including but not limited to the warranty expressed therein.
- Discoloration might be occurred on the package surface after soldering, reflow or long-time use. It neither impacts the performance nor reliability.