



The products are gate driver opto-couplers in a plastic WSOP8 package. The device consists of an infrared LED optically coupled to an integrated high-gain, high-speed photodetector IC chip. It provides guaranteed performance and specifications at temperature up to 110 °C. It is physically smaller and compliant with international safety standards for reinforced insulation. It thus provides a smaller footprint solution for applications that require safety standard certification. An internal noise shield provides a guaranteed common-mode transient immunity of  $\pm 20$  kV/ $\mu$ s. It is ideal for small class IGBT and power MOSFET gate drive. The products are widely used in industrial inverters, IGBT gate drivers, MOSFET gate drivers, induction cooktop and home appliances.



High isolation 7500 VRMS

Buffer logic type

Operating temperature range -40°C to 110°C

REACH & RoHS compliance

HBM: H3A; MM: M4; CDM: C3

CQC approved

VDE approved

UL approved

LED	V <sub>CC</sub> -V <sub>EE</sub> (Positive Going)	V <sub>CC</sub> -V <sub>EE</sub> (Negative Going)	Output
OFF	0-30V	0-30V	Low
ON	0-12.1V	0-11.1V	Low
ON	12.1V-13.5V	11.1V-12.4V	TRANSITION
ON	13.5V-30V	12.4V-30V	HIGH

(Temperature=25°C)

Parameter		Symbol	Value	Unit
LED	Forward Current	$I_F$	50	mA
	Peak Forward Current	$I_{FP}$	1	A
	Reverse Voltage	$V_R$	6	V
	Power Dissipation	$P_D$	100	mW
Detector	Output Voltage	$V_O$	35	V
	Supply Voltage	$V_{CC}$	35	V
	Power Dissipation	$P_C$	400	mW
Isolation Voltage		$V_{iso}$	7500	Vrms
Operating Temperature		$T_{opr}$	-40~110	
Junction Temperature		$T_j$	125	
Storage Temperature		$T_{stg}$	-55~125	
Total Power Dissipation		$P_{tot}$	500	mW
Soldering Temperature		$T_{sol}$	260	

: 100μs pulse, 100Hz frequency

: AC for 1minute, R.H.=40~60%

(Temperature=25°C)

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit
Input	Forward Voltage	$V_F$	$I_F=10mA$	-	1.35	1.6	V
	Reverse Current	$I_R$	$V_R=6V$	-	-	1	μA
	Terminal Capacitance	$C_t$	$V=0, f=1MHz$	-	60	-	pF
Output	Peak High-level Output Current	$I_{OPH}$	$V_O=V_{CC}-4V,$ Pulse width 50μs	-1	-	-	A
			$V_O=V_{CC}-10V,$ Pulse width 10μs	-3	-	-	A
	Peak Low-level Output Current	$I_{OPL}$	$V_O=V_{EE}+2.5V,$ Pulse width 50μs	1	-	-	A
			$V_O=V_{EE}+10V,$ Pulse width 10μs	3	-	-	A
	High Level Supply Current	$I_{CCH}$	$I_F=10mA$ $R_g=10$ , $C_g=25nF$	-	-	3	mA
	Low Level Supply Current	$I_{CCL}$	$V_F=0V,$ $R_g=10$ , $C_g=25nF$	-	-	3	mA

High Level Output Voltage	$V_{OH}$	$I_F=5mA,$ $V_{CC}=10V,$ $I_O=-100mA$	6	8.4	-	V
Low Level Output Voltage	$V_{OL}$	$V_F=0.8V,$ $V_{CC}=10V,$ $I_O=100mA$	-	0.3	1	V
Threshold Input Current	$I_{FLH}$	$V_{CC}=15V,$ $V_O 1V$	-	1.5	4	mA
Threshold Input Voltage	$V_{FHL}$	$V_{CC}=15V,$ $V_O 1V$	0.8	-	-	V
Supply Voltage	$V_{CC}$	-	15	-	30	V
High Level Output Voltage	$V_{OH}$	$I_F=5mA,$ $V_{CC}=10V,$ $I_O=-100mA$	6	8.4	-	V
UVLO Threshold	VUVLO+	$V_O 5V,$ $I_F=10mA$	12.1	12.8	13.5	V
	VUVLO-	$V_O 5V,$ $I_F=10mA$	11.1	11.8	12.4	V

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Propagation Delay Time to High Output Level	$t_{PLH}$	$R_g=47 \Omega,$ $C_g=3nF,$ $I_F=0 \text{ 5mA},$ $V_{CC}=30V$	30	-	500	ns
Propagation Delay Time to Low Output Level	$t_{PHL}$	$R_g=47 \Omega,$ $C_g=3nF,$ $I_F=5 \text{ 0mA},$ $V_{CC}=30V$	30	-	500	
Propagation Delay Difference Between Any Two Parts	$t_{PHL} - t_{PLH}$	$R_g=47 \Omega,$ $C_g=3nF,$ $I_F=0 \text{ 5mA},$ $V_{CC}=30V$	-	-	350	
Output Rise Time (10 to 90%)	$t_r$	$R_g=47 \Omega,$ $C_g=3nF,$ $I_F=0 \text{ 5mA},$ $V_{CC}=30V$	-	50	-	
Output Fall Time (90 to 10%)	$t_f$	$R_g=47 \Omega,$ $C_g=3nF,$ $I_F=5 \text{ 0mA},$ $V_{CC}=30V$	-	50	-	

Common Mode Transient Immunity at High Level Output	$ CM_H $	$I_F=5mA$ $V_{CC}=30V,$ $T_a=25$ , $V_O(min)=26V$ $V_{CM}=1000V_{pp}$	$\pm 20$	$\pm 25$	-	kV/ $\mu s$
Common Mode Transient Immunity at Low Level Output	$ CM_L $	$I_F=0mA$ $V_{CC}=30V,$ $T_a=25$ , $V_O(max)=1V$ $V_{CM}=1000V_{pp}$	$\pm 20$	$\pm 25$	-	kV/ $\mu s$

All Typical values at  $T_a=25$

: Input signal ( $f=25kHz, duty=50%, tr=tf=5ns$  or less).  $C_L$  is less than 15 pF which includes probe and stray wiring capacitance.

:  $CM_H$  is the maximum rate of fall of the common mode voltage that can be sustained with the output voltage in the logic high state ( $V_O = 26V$ ).

:  $CM_L$  is the maximum rate of rise of the common mode voltage that can be sustained with the output voltage in the logic low state ( $V_O = 1V$ ).

Characteristics	Symbol	Min.	Typ.	Max.	Unit
Input On-state Current	$I_{F(ON)}$	6.5	-	10	mA
Input Off-state Voltage	$V_{F(OFF)}$	0	-	0.8	V
Supply Voltage	$V_{CC}$	15	-	30	V
Operating Frequency	f	-	-	25	kHz

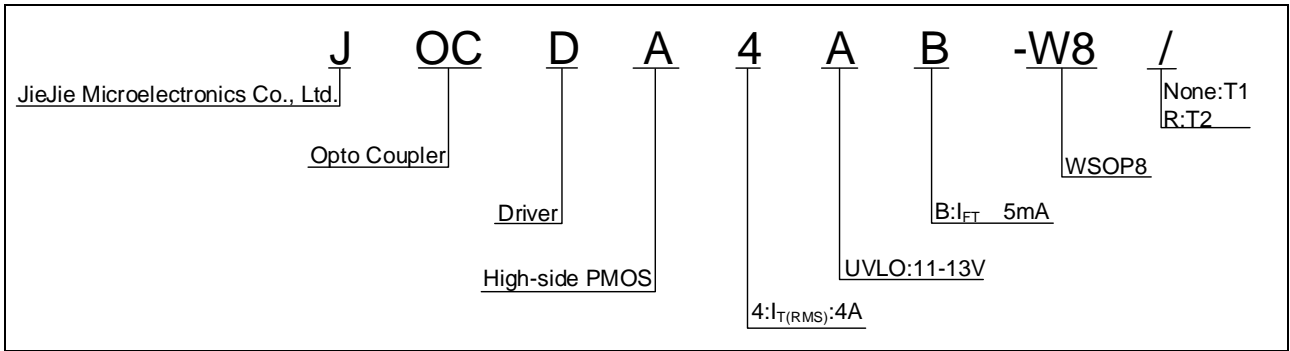
: The recommended operating conditions are given as a design guide necessary to obtain the intended performance of the device. Each parameter is an independent value. When creating a system design using this device, the electrical characteristics specified in this datasheet should also be considered.

: A ceramic capacitor (0.1 $\mu F$ ) should be connected between pin 6 ( $V_{CC}$ ) and pin 4 (GND) to stabilize the operation of a high gain linear amplifier. Otherwise, this photocoupler may not switch properly. The bypass capacitor should be placed within 1 cm of each pin.

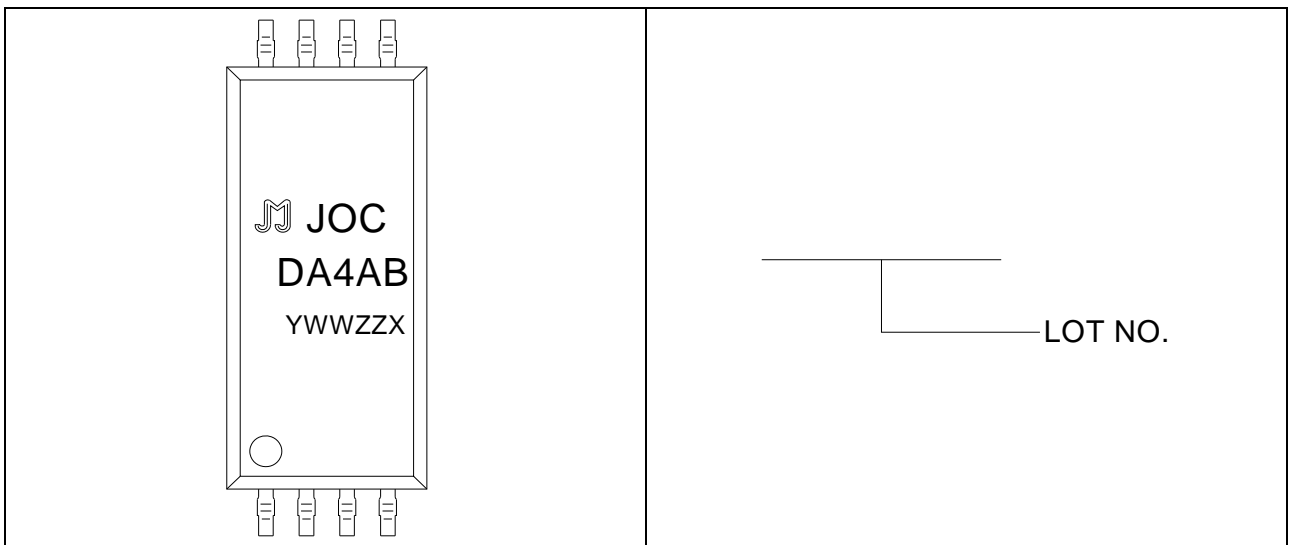
: The rise and fall times of the input on current should be less than 0.5  $\mu s$ .

: If the rising slope of the supply voltage ( $V_{CC}$ ) for the detector is steep, stable operation of the internal circuits cannot be guaranteed. Be sure to set 3V/ $\mu s$  or less for a rising slope of the  $V_{CC}$ .

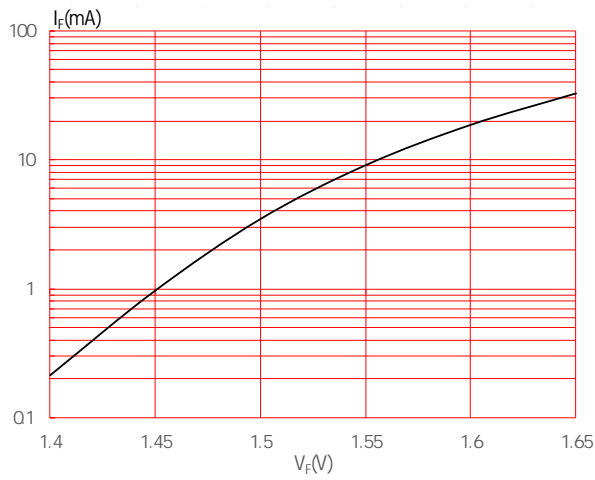
: Denotes the operating range, not the recommended operating condition.



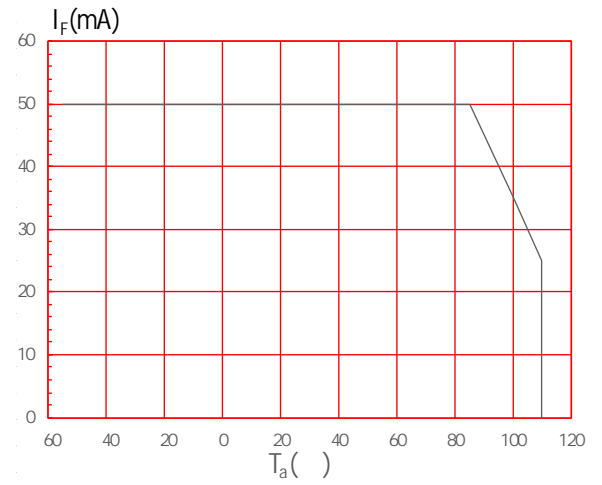
None/R	1200Units/Reel



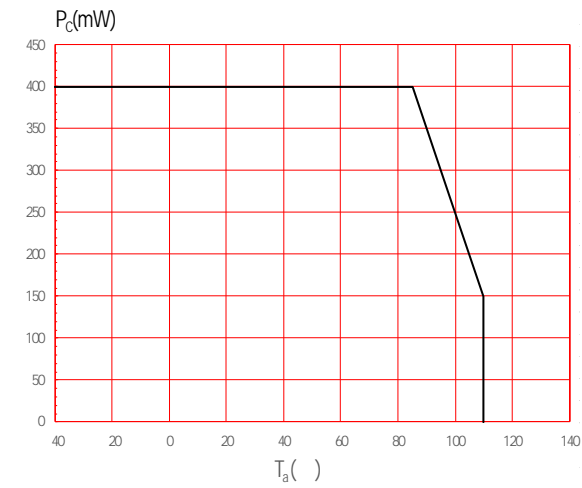
**FIG.1:** Forward Current vs. Forward Voltage



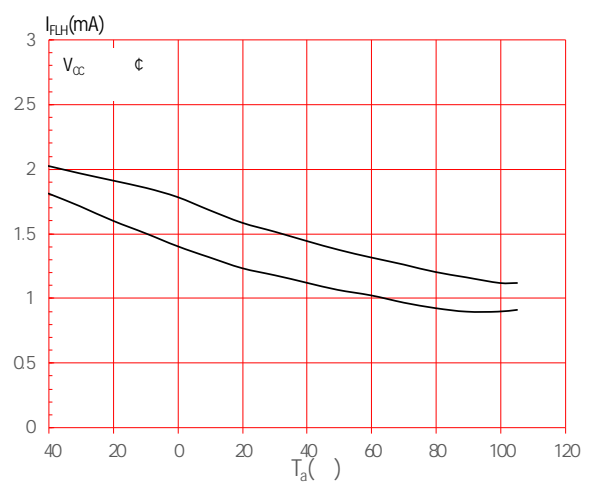
**FIG.2:** Max. Allowable LED Forward Current vs. Ambient Temperature



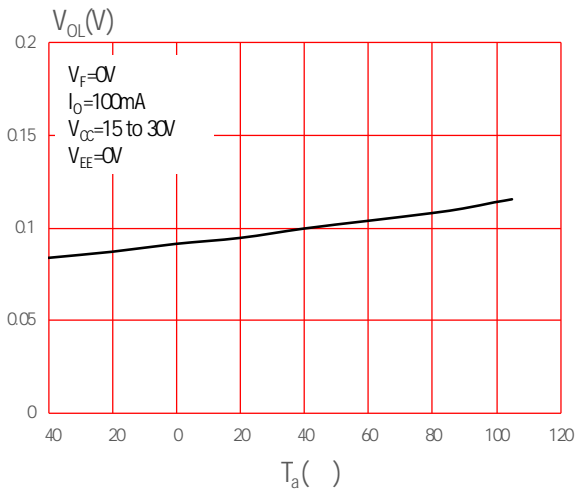
**FIG.3:** Collector Power Dissipation vs. Ambient Temperature



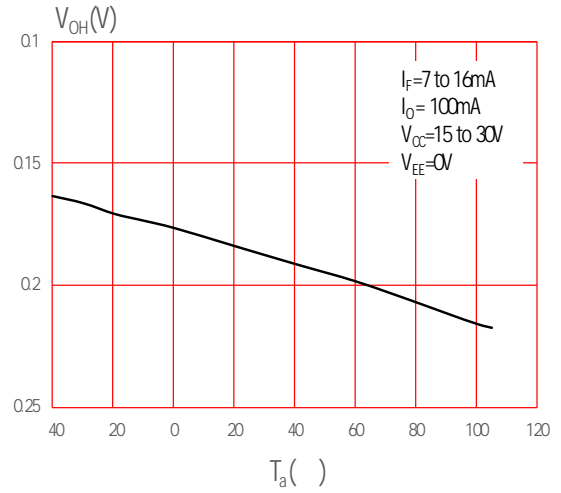
**FIG.4:** Threshold Input Current vs. Ambient Temperature



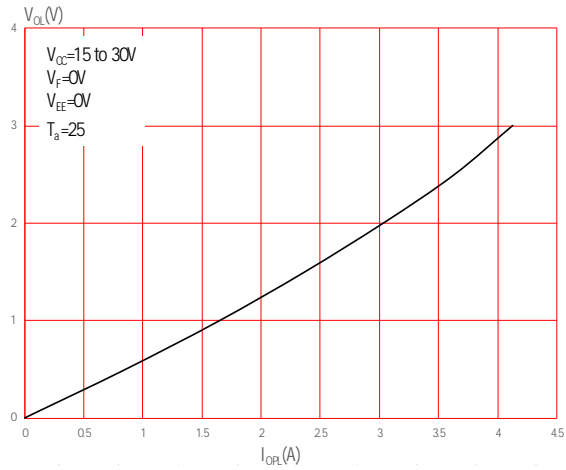
**FIG.7:** Low-level Output Voltage vs. Ambient Temperature



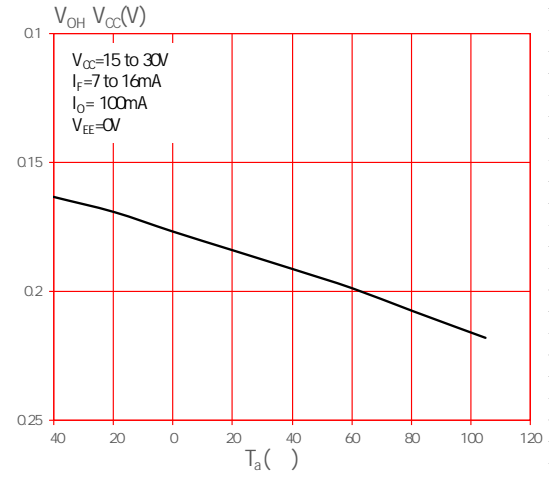
**FIG.8:** High-level Output Voltage vs. Ambient Temperature



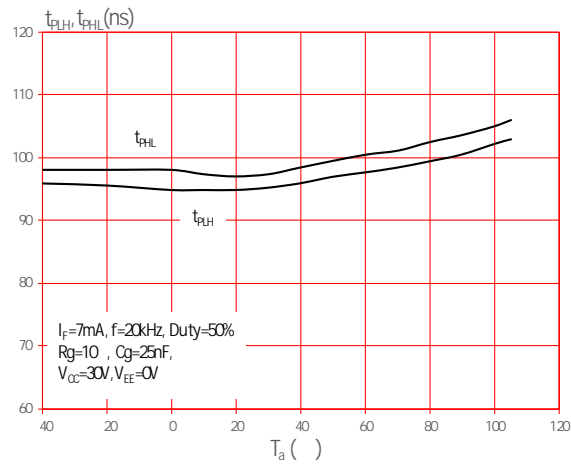
**FIG.9:** Peak Low-level Output Current vs. Low-level Output Voltage



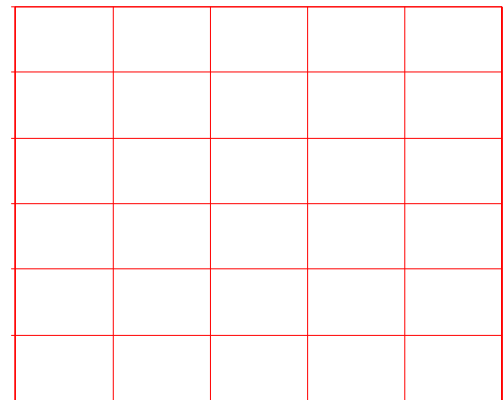
**FIG.10:** High-level Output Voltage Drop vs. Ambient Temperature



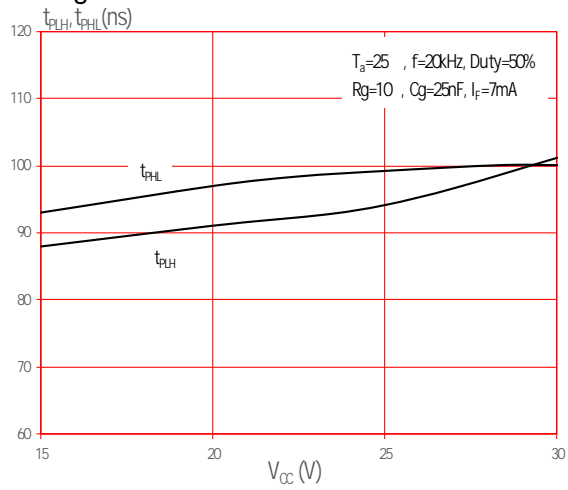
**FIG.11:** Propagation Delay Time vs. Ambient Temperature



**FIG.12:** Propagation Delay Time vs. Forward Current

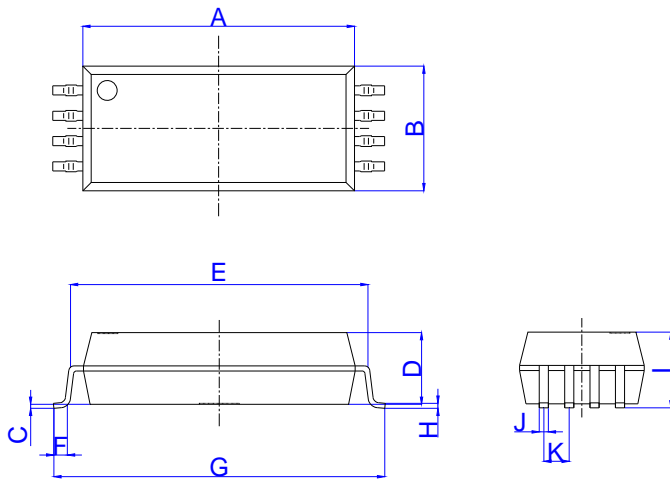


**FIG.13:** Propagation Delay Time vs. Supply Voltage

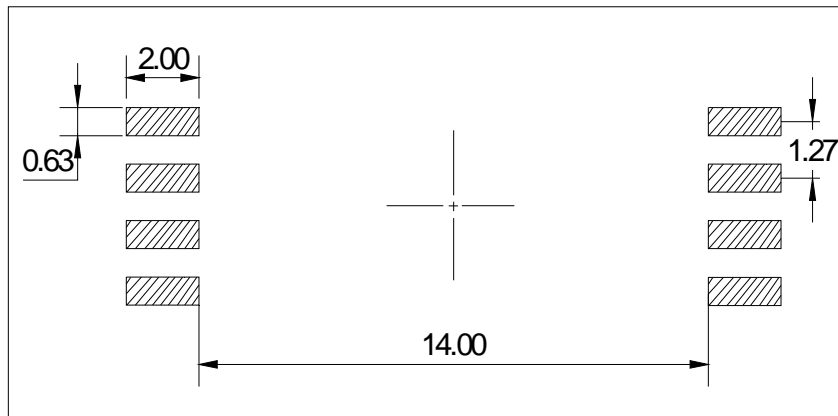


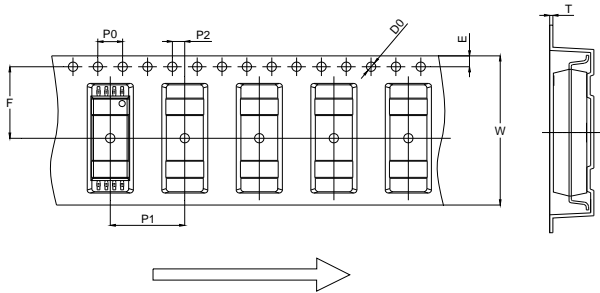
**FIG.14:** Switching Time Test Circuit and Waveform



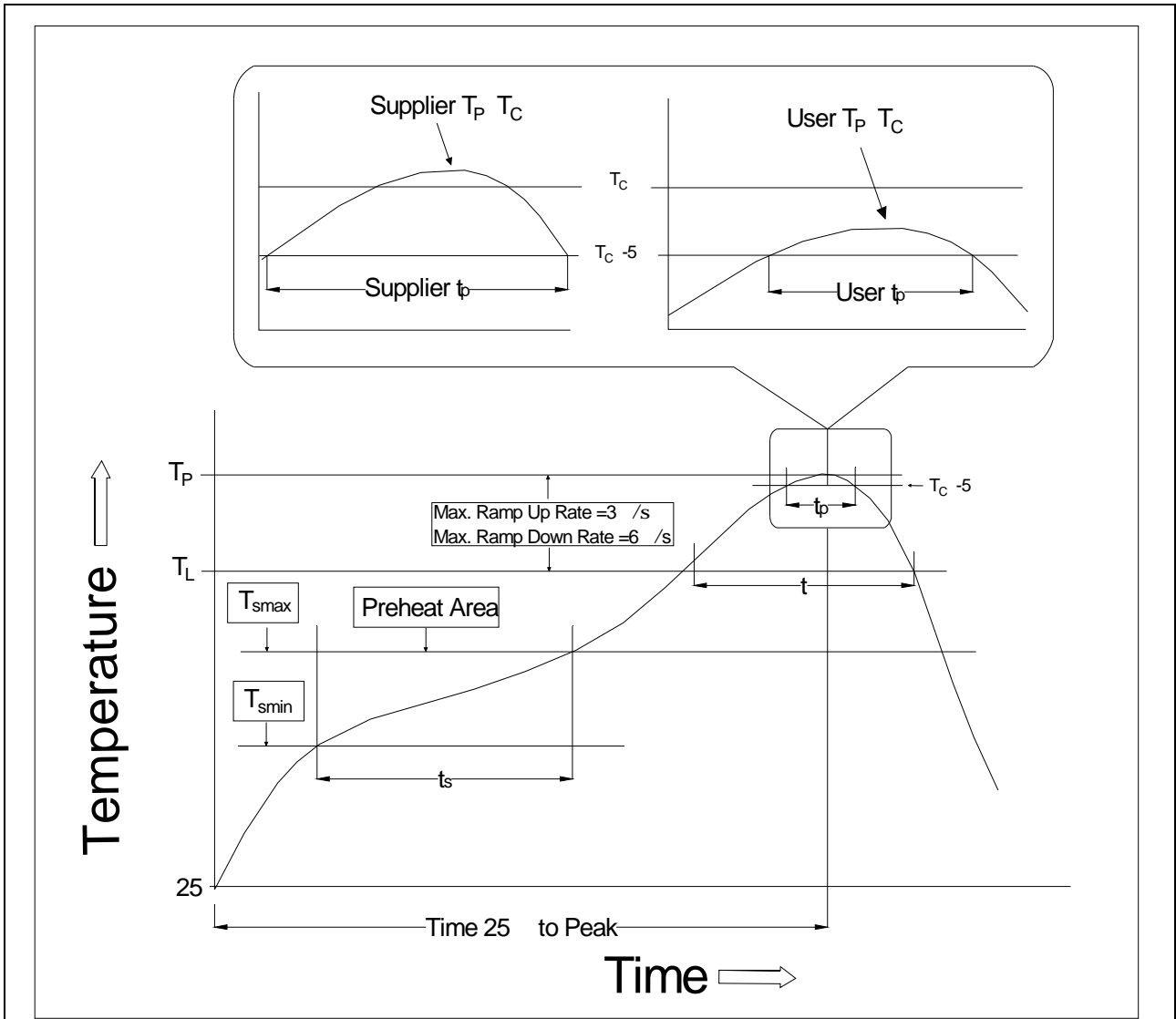


Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	13.50		13.70	0.531		0.539
B	6.15		6.35	0.242		0.250
C	0.10		0.30	0.004		0.012
D	3.50		3.70	0.138		0.146
E	14.71		15.31	0.579		0.603
F	0.52		1.02	0.020		0.040
G	16.36		16.86	0.644		0.664
H	0.10		0.40	0.004		0.016
I	3.65		3.95	0.144		0.156
J	0.307		0.607	0.012		0.024
K	1.02		1.52	0.040		0.060





Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
D0	1.40	1.50	1.60	0.055	0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	11.90	12.00	12.10	0.469	0.472	0.476
P2	1.90	2.00	2.10	0.075	0.079	0.083
E	1.65	1.75	1.85	0.065	0.069	0.073
F	11.40	11.50	11.60	0.449	0.453	0.457
T	0.35	0.40	0.45	0.014	0.016	0.018
W	23.70	24.00	24.30	0.933	0.945	0.957



Profile Feature	Sn-Pb Assembly Profile	Pb-Free Assembly Profile
Temperature Min. (T <sub>smin</sub> )	100	150
Temperature Max. (T <sub>smax</sub> )	150	200
Time (t <sub>s</sub> ) from (T <sub>smin</sub> to T <sub>smax</sub> )	60-120 seconds	60-120 seconds
Ramp-up Rate (t <sub>L</sub> to t <sub>P</sub> )	3 /second max.	3 /second max.
Liquidus Temperature (T <sub>L</sub> )	183	217
Time (t <sub>L</sub> ) Maintained Above (T <sub>L</sub> )	60-150 seconds	60-150 seconds
Peak Body Package Temperature	235 +0 /-5	260 +0 /-5
Time (t <sub>P</sub> ) within 5 of 260	20 seconds	30 seconds
Ramp-down Rate (T <sub>P</sub> to T <sub>L</sub> )	6 /second max.	6 /second max.
Time 25 to Peak Temperature	6 minutes max.	8 minutes max.

