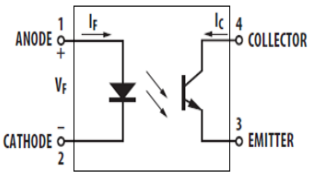
JOC217X Series

Rev.A.1.0

DESCRIPTION:

The JOC217X is a photoelectric coupler composed of light-emitting diode and phototransistor. It is packaged in a 4-pin package at SSOP4. The products are widely used in switching power supply, intelligent meter, industrial control, measuring instruments, office equipment such as copiers, household appliances: such as air conditioners, fans, water heaters,etc.

Schematic



MAIN FEATURES

Current transfer ratio（CTR: 80%-600% @I_F=5mA, V_{CE}=5V）
High isolation voltage between input and output (V_{iso}=3,750Vrms)
Creepage distance > 5mm
Operating temperature up to +110°C
Collector-Emitter voltage BV_{CEO}≥80V
UL approved
The products comply with RoHS, REACH and HF

ABSOLUTE MAXIMUM RATINGS (Temperature=25°C)

Parameter		Symbol	Value	Unit
Input	Forward Current	I_F	50	mA
	Peak Forward Current	I_{FP}	1①	A
	Reverse Voltage	V_R	6	V
	Power Dissipation	P_D	70	mW
Output	Collector-emitter Voltage	V_{CEO}	80	V
	Emitter-collector Voltage	V_{ECO}	6	V
	Collector Current	I_C	50	mA
	Power Dissipation	P_C	150	mW
Total Power Dissipation		P_{tot}	200	mW
Isolation Voltage		V_{iso}	3750②	Vrms
Operating Temperature		T_{opr}	-55~+110	℃
Storage Temperature		T_{stg}	-55~+125	℃
Soldering Temperature		T_{sol}	260	℃

NOTE1: 1 μs pulse **NOTE2**: AC for 1minute, R.H.=40~60%

ELECTRICAL CHARACTERISTICS (Temperature=25°C)

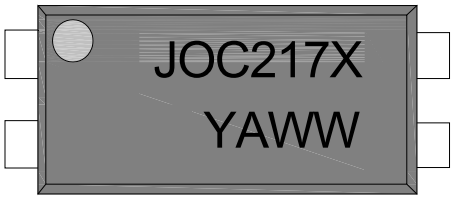
Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit
Input	Forward Voltage	V_F	I_F=10mA	-	1.2	1.3	V
			I_F=20mA	-	1.24	1.4	
	Reverse Current	I_R	V_R=4V	-	-	1	μA
	Terminal Capacitance	C_t	V=0, f=1kHz	-	30	250	pF
Output	Collector-Emitter dark current	I_{CEO}	V_{CE}=20V, I_F=0	-	-	50	nA
	Collector-Emitter breakdown voltage	BV_{CEO}	I_C=0.1mA I_F=0	80	-	-	V
	Emitter-Collector breakdown voltage	BV_{ECO}	I_E=0.1mA I_F=0	7	-	-	V
Transfer Characteristics	Current transfer ratio	CTR①	I_F=5mA V_{CE}=5V	80	-	600	%
	Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_F=10mA I_C= 1mA	-	0.06	0.2	V
	Isolation resistance	R_{IO}	DC500V 40~60%R.H.	5×10^{10}	10^{11}	-	Ω
	Floating Capacitance	C_{IO}	V=0, f=1MHz	-	0.3	1	pF
	Cut-off Frequency	f_c	V_{CE}=5V, I_C=2mA R_L=100Ω, -3dB	-	80	-	kHz
	Rise Time	t_r	V_{CE}=2V, I_C=2mA R_L=100Ω	-	5	18	μs
	Fall Time	t_f		-	4	18	μs
	Response Time	t_{on}			9	25	μs
		t_{off}			5	25	μs

NOTE1: Rank Table of Current Transfer Ratio (Temperature=25°C)

Grade Sign	Min. (%)	Max. (%)
A	80	160
B	130	260
C	200	400
D	300	600
L	80	100
Q	100	200

ORDERING AND MARKING INFORMATION

MARKING INFORMATION



JOC : Company Abbr.
217 : Part Number
X : CTR Rank
Y : Fiscal Year
A : Manufacturing Code
WW : Work Week

ORDERING INFORMATION

JOC217X(Z)-G

JOC – Company Abbr.
217 – Part Number
X – Rank (A/B/C/D/L/Q or None)
Z – Tape and Reel Option (T1)
G – Green

Packing Quantity

Option	Quantity	Quantity – Inner box	Quantity –Outer box
SSOP4(T1)	3000 Units/Reel	2 Reels/Inner box	10 Inner box/Outer box =60k Units

Characteristics Curves

FIG.1: Forward Current vs. Ambient Temperature

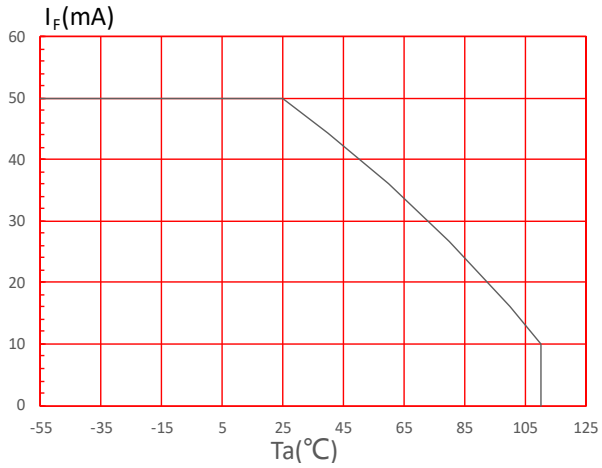


FIG.2: Collector Power Dissipation vs. Ambient Temperature

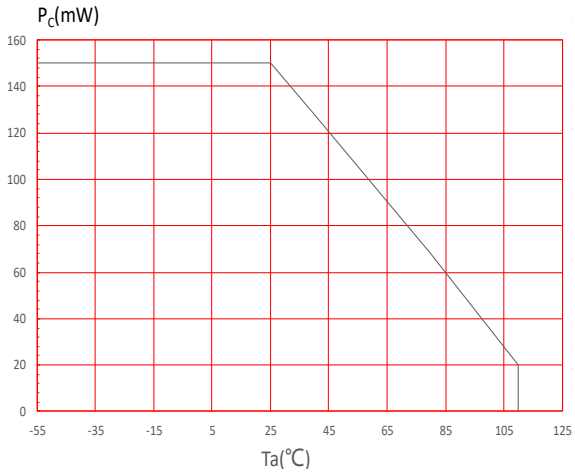


FIG.3: Forward Current vs. Forward Voltage

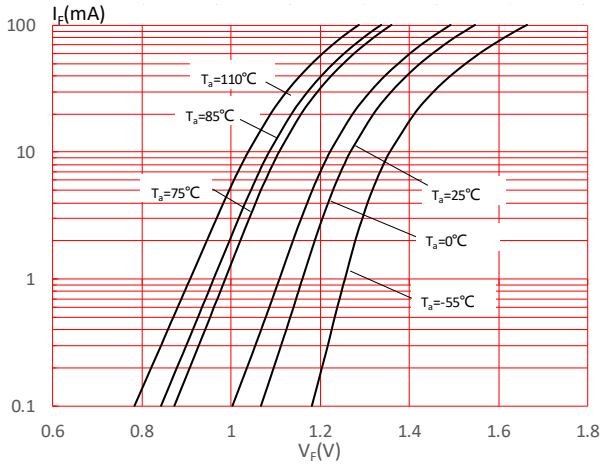


FIG.4: Collector Dark Current vs. Ambient Temperature

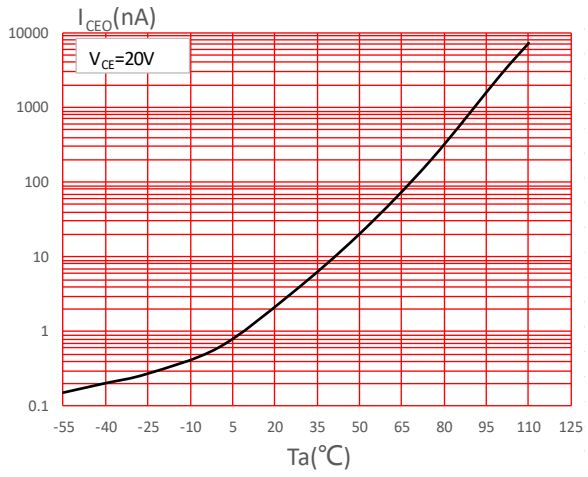


FIG.5: Collector Current vs. Collector-emitter Voltage

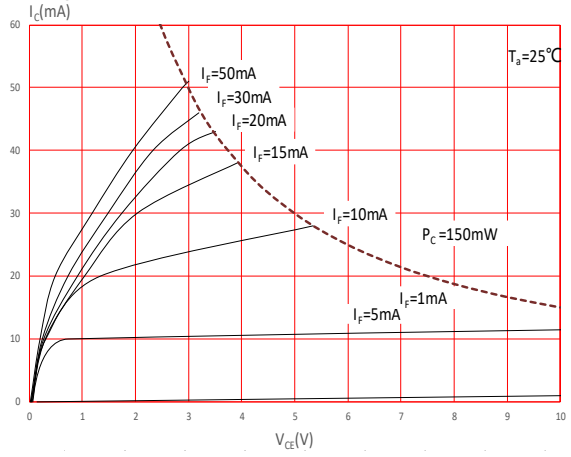


FIG.6: Normalized Current Transfer Ratio vs. Forward Current

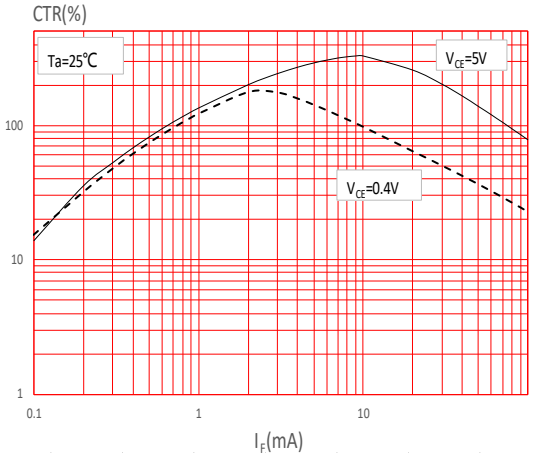


FIG.7: Normalized Current Transfer Ratio vs. Ambient Temperature

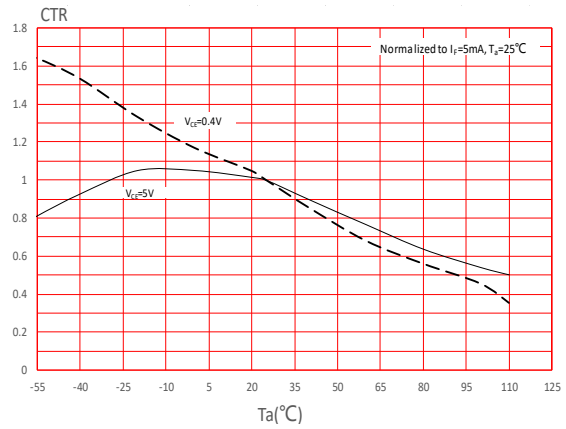


FIG.8: Collector-emitter Saturation Voltage vs. Ambient Temperature

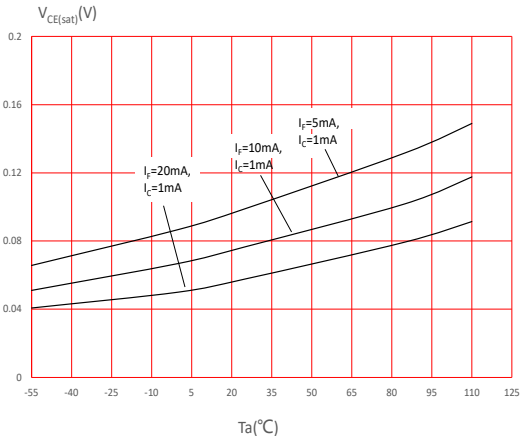


FIG.9: Response Time vs. Load Resistance

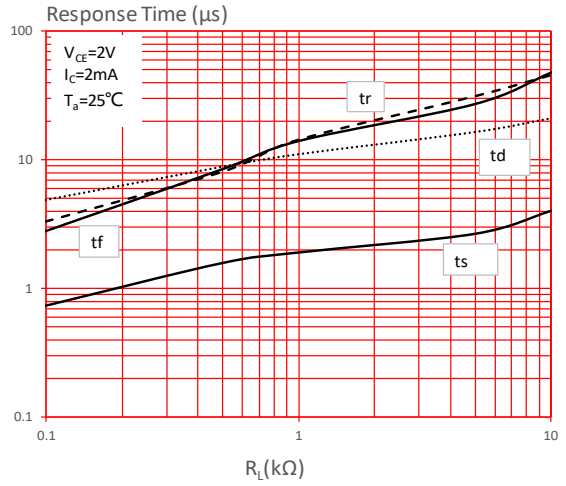
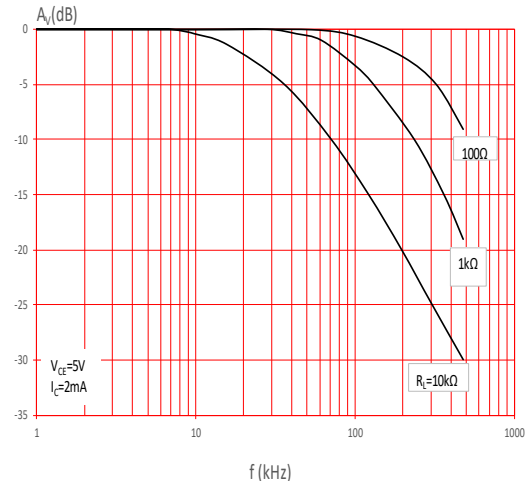


FIG.10: Frequency Response



Test Circuits

FIG.11: Test Circuits of Response Time

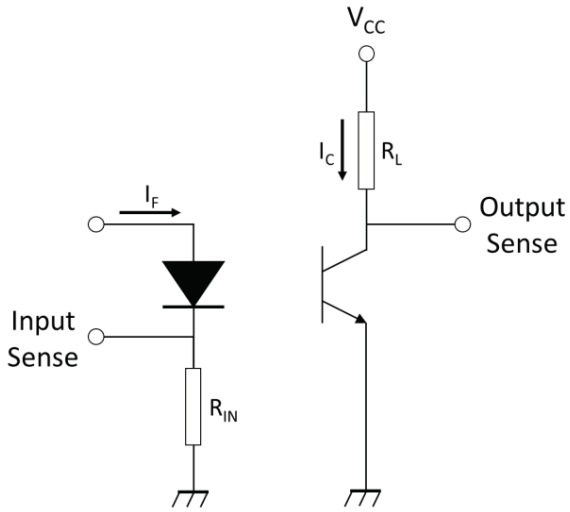


FIG.12: Curves of Response Time

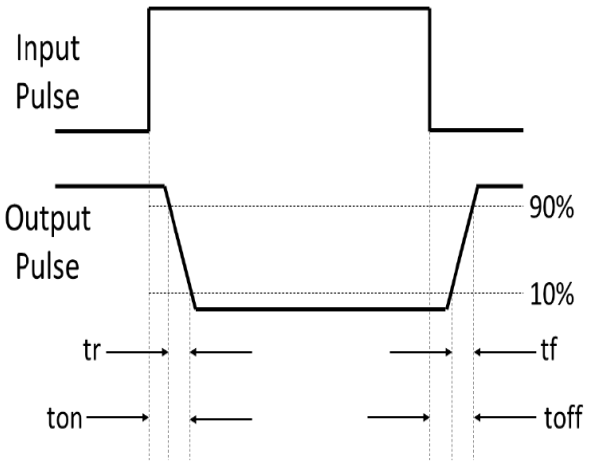
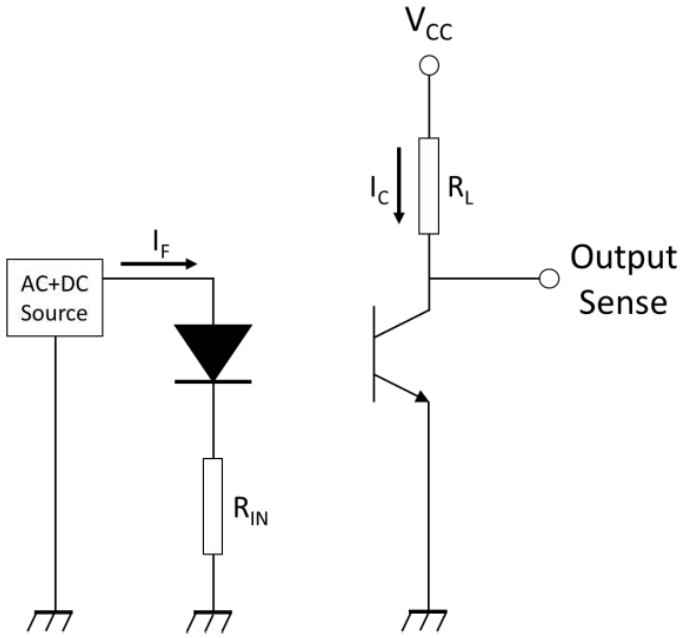
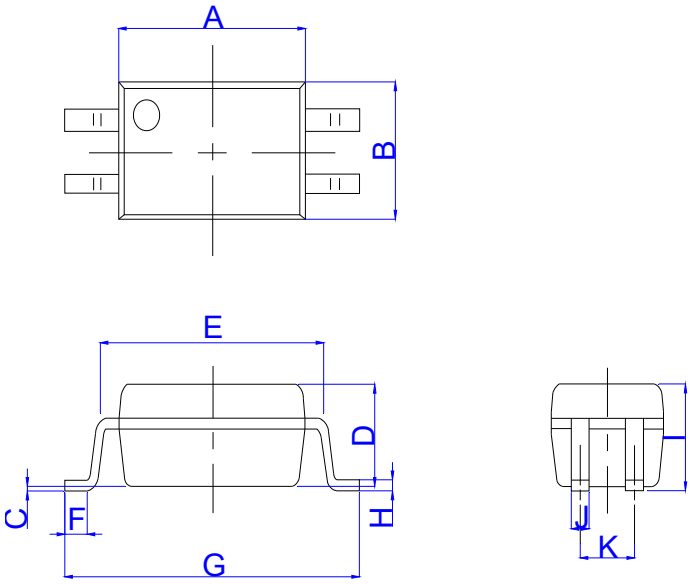


FIG.13: Test Circuits of Frequency Response



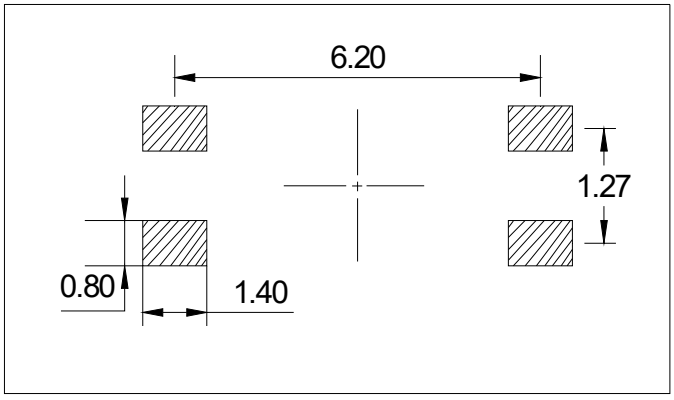
Package Dimension (Unit: mm）

Standard SSOP4 Type:



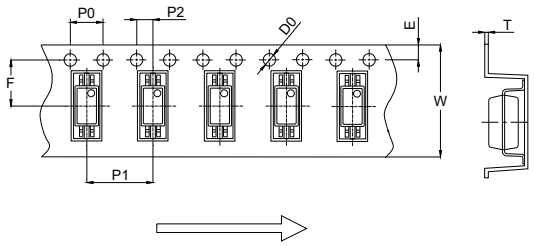
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.25		4.85	0.168		0.192
B	2.40		3.00	0.095		0.119
C	0.00		0.20	0.000		0.008
D	1.75		2.35	0.069		0.093
E	5.00		5.60	0.198		0.221
F	0.40			0.016		
G	6.70		7.30	0.265		0.289
H	0.10		0.30	0.004		0.012
I	0.20		0.40	0.008		0.016
J	0.30		0.50	0.012		0.020
K	1.02		1.52	0.040		0.060

RECOMMENDED SOLDER MASK (Dimensions in mm unless otherwise stated)



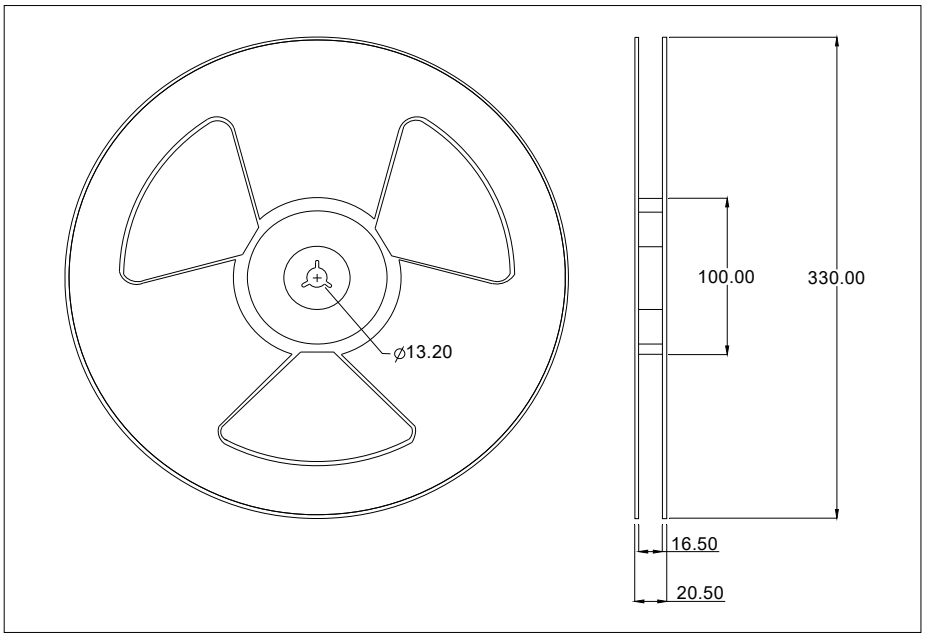
CARRIER TAPE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Option SSOP4(T1)

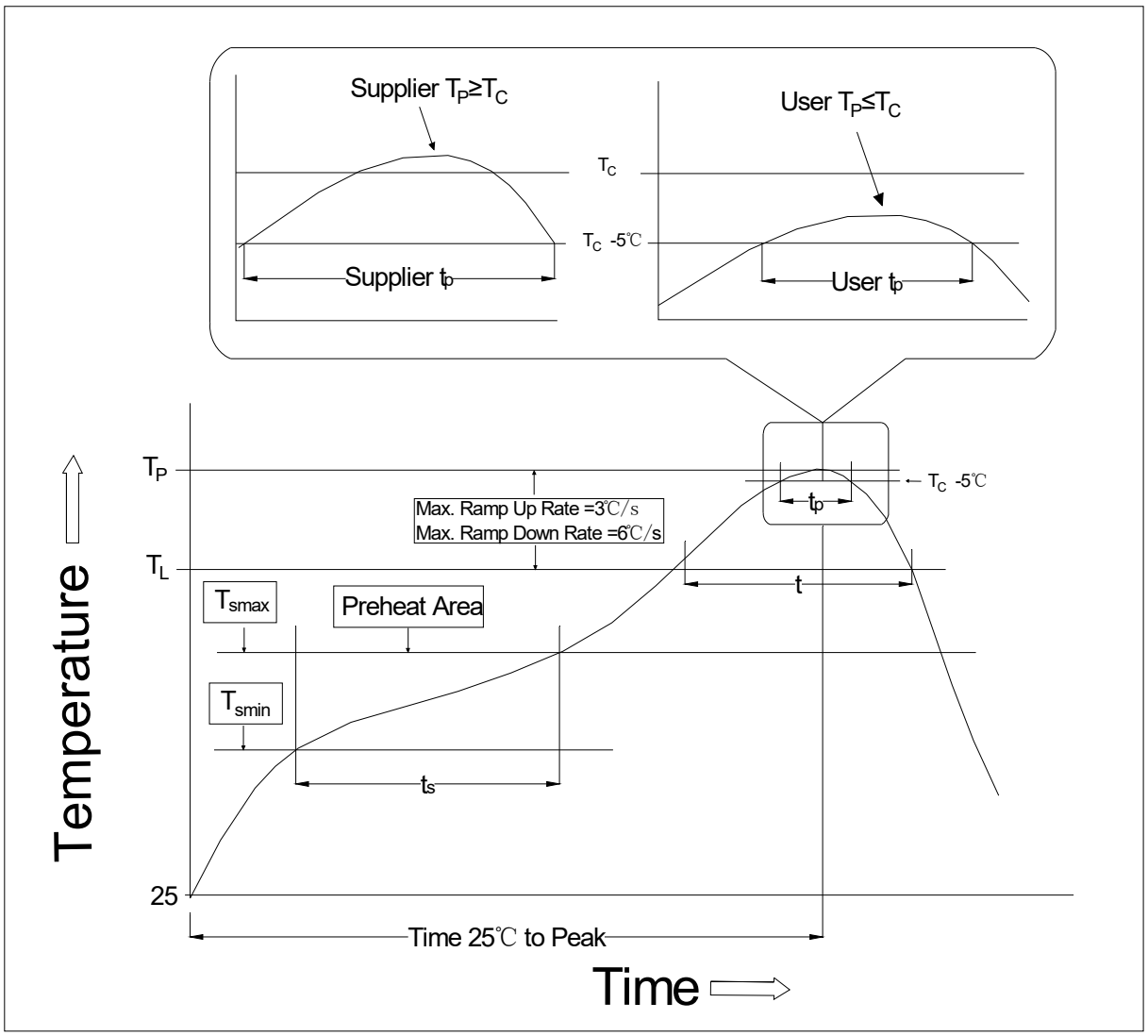


Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
D0	1.55		1.65	0.061		0.065
P0	3.90		4.10	0.154		0.162
P1	7.90		8.10	0.312		0.320
P2	1.90		2.10	0.075		0.083
E	1.65		1.85	0.065		0.073
F	5.40		5.60	0.213		0.221
T	0.20		0.30	0.008		0.012
W	11.80		12.20	0.466		0.482

REEL SPECIFICATIONS (Dimensions in mm unless otherwise stated)



REFLOW INFORMATION



Profile Feature	Sn-Pb Assembly Profile	Pb-Free Assembly Profile
Temperature Min. (Tsmin)	100	150℃
Temperature Max. (Tsmax)	150	200℃
Time (ts) from (Tsmin to Tsmax)	60-120 seconds	60-120 seconds
Ramp-up Rate (tL to tP)	3℃/second max.	3℃/second max.
Liquidous Temperature (TL)	183℃	217℃
Time (tL) Maintained Above (TL)	60-150 seconds	60-150 seconds
Peak Body Package Temperature	235℃+0℃/-5℃	260℃+0℃/-5℃
Time (tP) within 5℃ of 260℃	20 seconds	30 seconds
Ramp-down Rate (TP to TL)	6℃/second max.	6℃/second max.
Time 25℃ to Peak Temperature	6 minutes max.	8 minutes max.

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