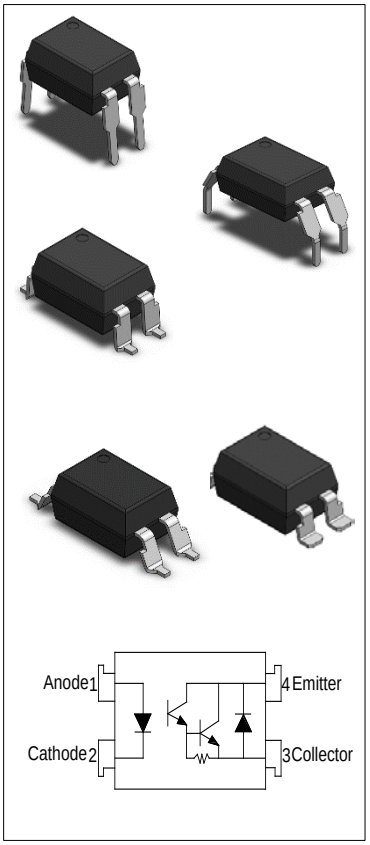
JOC852 Series

Rev.A.1.0

DESCRIPTION:

The JOC852 series consist of an infrared light-emitting diode and a photo Darlington detector. The devices can realize electrical isolation and signal transmission between different circuits. The products are widely used in equipment, such as switch mode power supplies, computer peripheral interface, microprocessor system interface, telephone line interface, etc.



MAIN FEATURES

High current transfer ratio（CTR≥1000% @I_F=1mA, V_{CE}=2V）
High isolation voltage between input and output
(V_{iso}=5,000Vrms)
Operating temperature up to +110°C
Collector-Emitter voltage BV_{CEO}≥350V
CQC approved
VDE approved
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	60	mA
	Reverse Voltage	V_R	6	V
	Peak Forward Current	I_{FP}	1①	A
	Power Dissipation	P_D	100	mW
Output	Collector-emitter Voltage	V_{CEO}	350	V
	Emitter-collector Voltage	V_{ECO}	0.1	V
	Collector Current	I_C	150	mA
	Power Dissipation	P_C	150	mW
Total Power Dissipation		P_{tot}	200	mW
Isolation Voltage		V_{iso}	5000②	Vrms
Operating Temperature		T_{opr}	-55~+110	℃

Storage Temperature	T_{stg}	-55~+125	℃
Soldering Temperature	T_{sol}	260	℃

NOTE1: 100μs pulse, 100Hz frequency
NOTE2: AC for 1minute, R.H.=40~60%

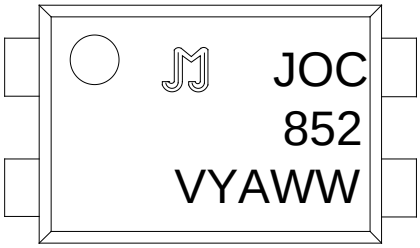
ELECTRICAL CHARACTERISTICS (Temperature=25°C)

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit
Input	Forward Voltage	V_F	I_F=10mA	-	1.2	1.4	V
			I_F=20mA	-	1.24	1.5	
	Reverse Current	I_R	V_R=6V	-	-	1	μA
	Terminal Capacitance	C_t	V=0, f=1MHz	-	30	250	pF
Output	Collector-Emitter dark current	I_{CEO}	V_{CE}=200V, I_F=0mA	-	-	50	nA
	Collector-Emitter breakdown voltage	BV_{CEO}	I_C=0.1mA I_F=0mA	350	-	-	V
	Emitter-Collector breakdown voltage	BV_{ECO}	I_E=0.1mA I_F=0mA	0.1	-	-	V
Transfer Characteristics	Collector current	I_C	I_F=1mA V_{CE}=2V	10	-	150	mA
	Current transfer ratio	CTR①	I_F=1mA V_{CE}=2V	1000	-	15000	%
	Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_F=20mA I_C=100mA	-	-	1.2	V
	Isolation resistance	R_{IO}	DC500V 40~60%R.H.	5×10^{10}	-	-	Ω
	Floating Capacitance	C_{IO}	V=0, f=1MHz	-	0.6	1	pF
	Cut-off Frequency	f_c	V_{CE}=2V, I_C=20mA R_L=100Ω, -3dB	-	7	-	kHz
	Rise Time	t_r	V_{CE}=2V, I_C=10mA R_L=100Ω	-	0.3	1	μs
	Fall Time	t_f		-	30	100	μs

NOTE1: Current Transfer Ratio= $I_C/I_F\times100\%$，Tolerance: ±3%

ORDERING AND MARKING INFORMATION

MARKING INFORMATION



JOC : Company Abbr.
852 : Part Number
VYAWW : LOT NO.

ORDERING INFORMATION

JOC852(Y)(Z)- GV

JOC – Company Abbr.
852 – Part Number
Y – Lead Form Option (M/S/SL/SLM/None)
Z – Tape and Reel Option (T1/T2/T3/T4)
G – Green
V – VDE Option (V or None)

Packing Quantity

Option	Quantity	Quantity – Inner box	Quantity –Outer box
None/M	100 Units/Tube	32 Tubes/Inner box	10 Inner box/Outer box =32k Units
S(T1/T2)	1500 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box =22.5k Units
S(T3/T4)	1000 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box =15k Units
SL(T1/T2)	1500 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box =22.5k Units
SL(T3/T4)	1000 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box =15k Units
SLM(T1/T2)	1500 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box =22.5k Units

Characteristics Curves

FIG.1: Forward Current vs. Ambient Temperature

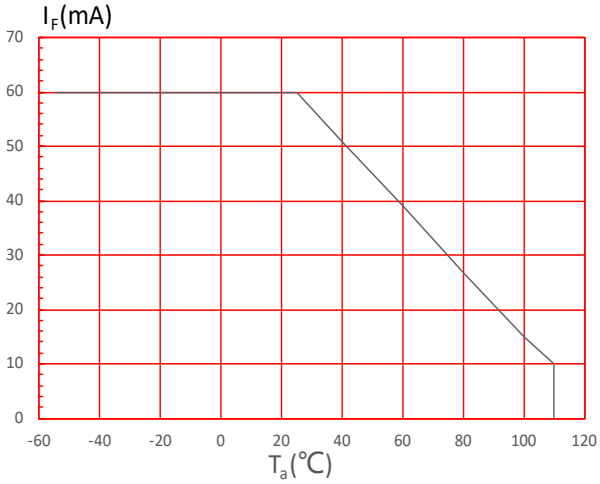


FIG.2: Collector Power Dissipation vs. Ambient Temperature

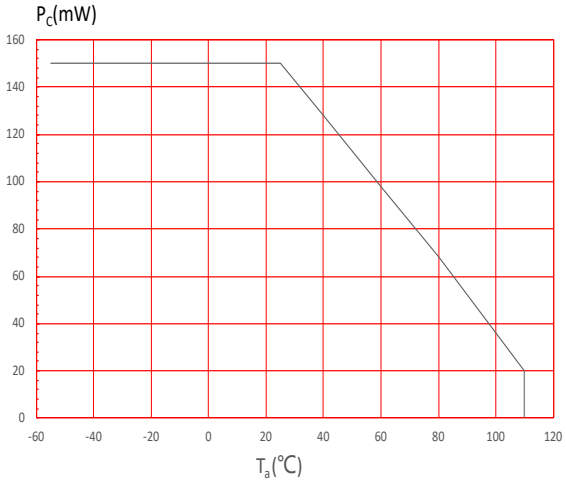


FIG.3: Forward Current vs. Forward Voltage

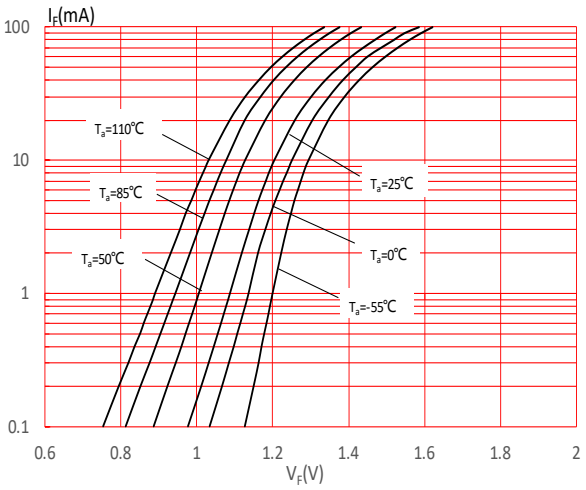


FIG.4: Normalized Collector Dark Current vs. Ambient Temperature

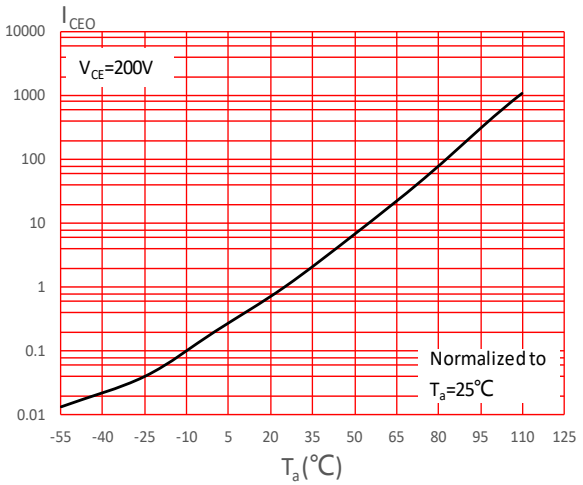


FIG.5: Collector Current vs. Collector-emitter Voltage

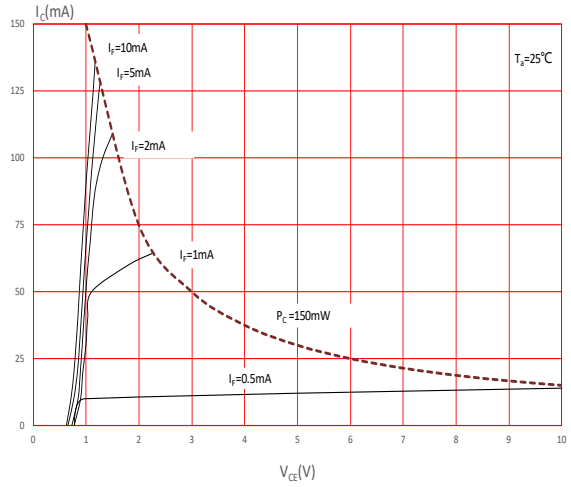


FIG.6: Normalized Current Transfer Ratio vs. Forward Current

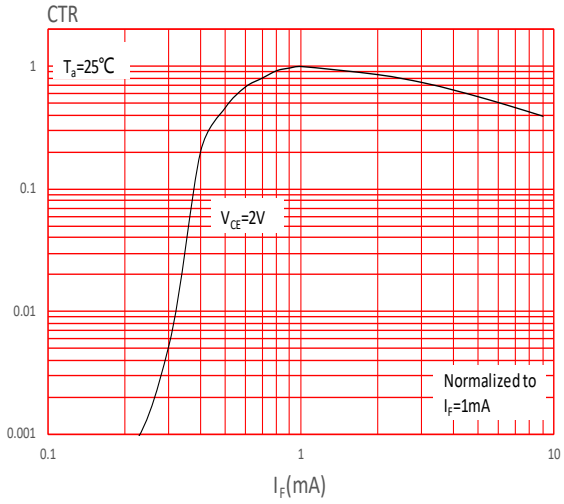


FIG.7: Normalized Current Transfer Ratio vs. Ambient Temperature

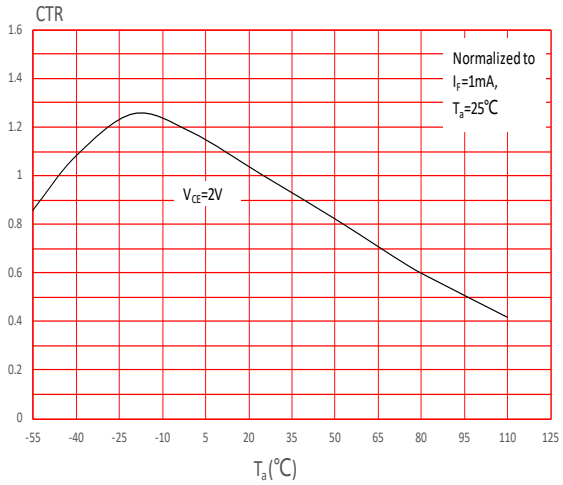


FIG.8: Normalized Collector-emitter Saturation Voltage vs. Ambient Temperature

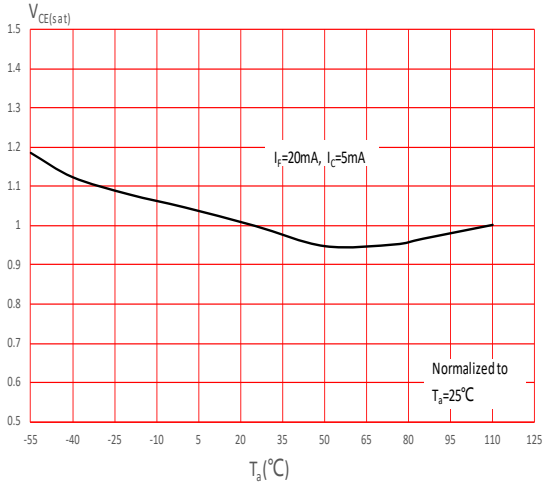


FIG.9: Response Time vs. Load Resistance

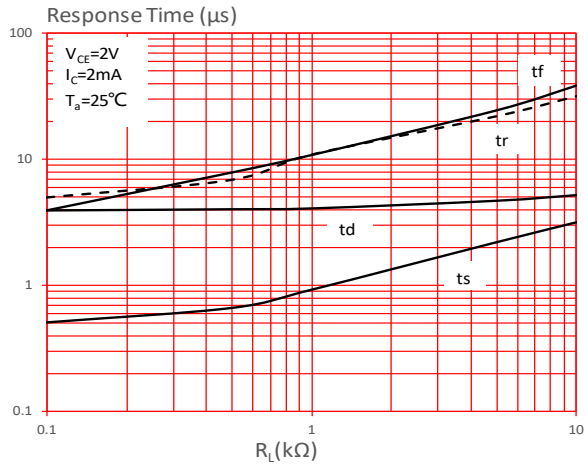
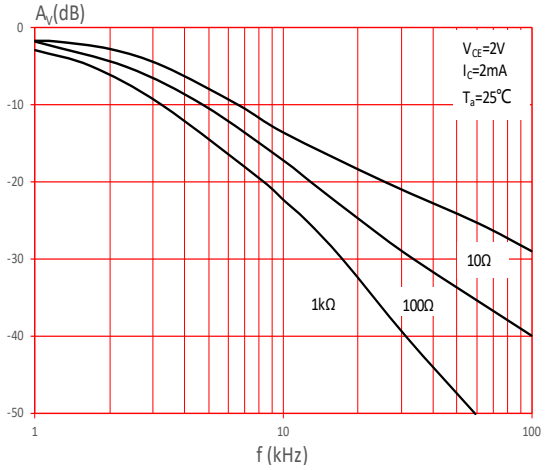


FIG.10: Frequency Response



Test Circuits

FIG.11: Test Circuits of Response Time

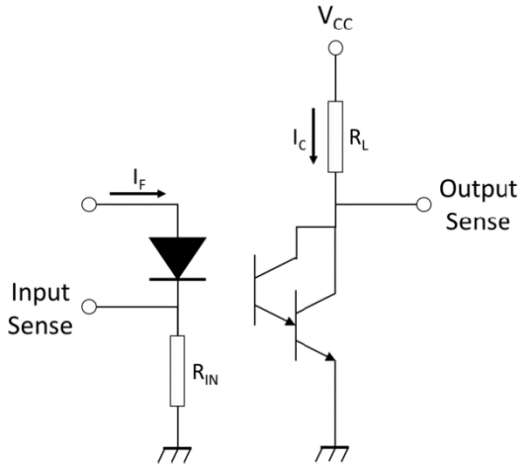


FIG.12: Curves of Response Time

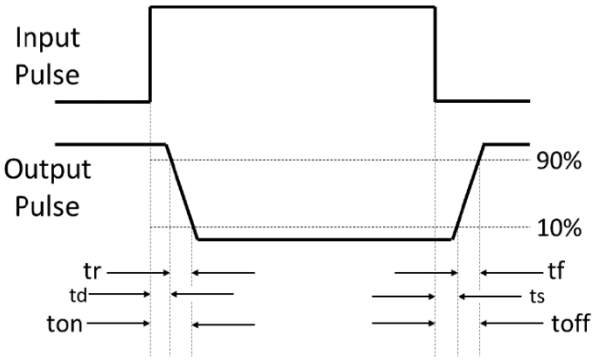
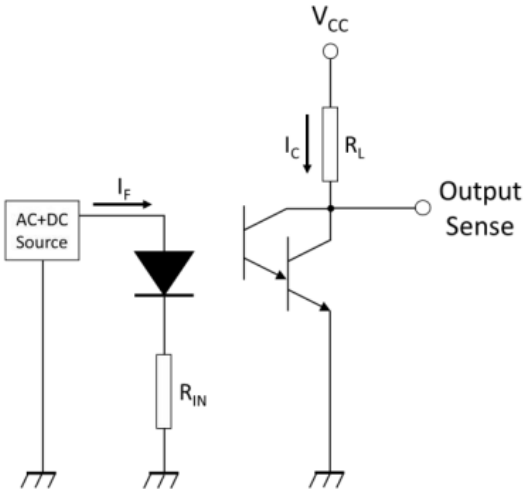
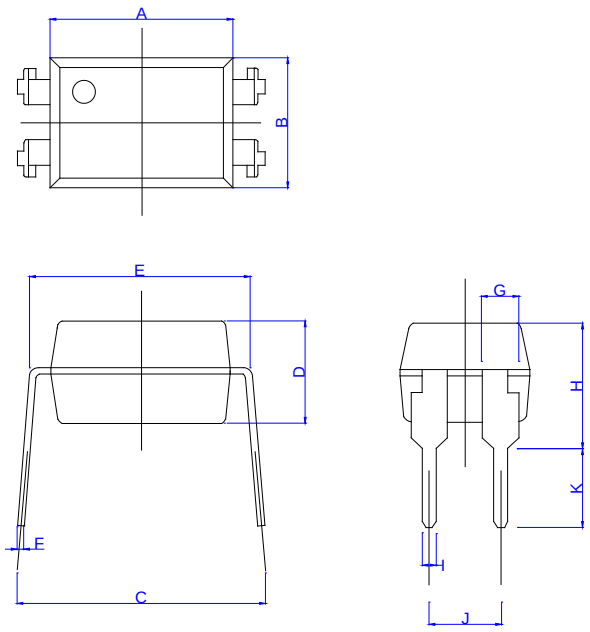


FIG.13: Test Circuits of Frequency Response



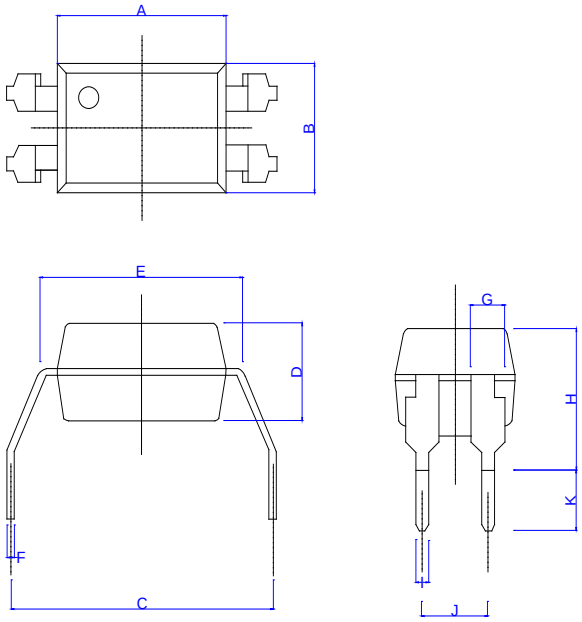
Package Dimension (Unit: mm）

Standard DIP Type:



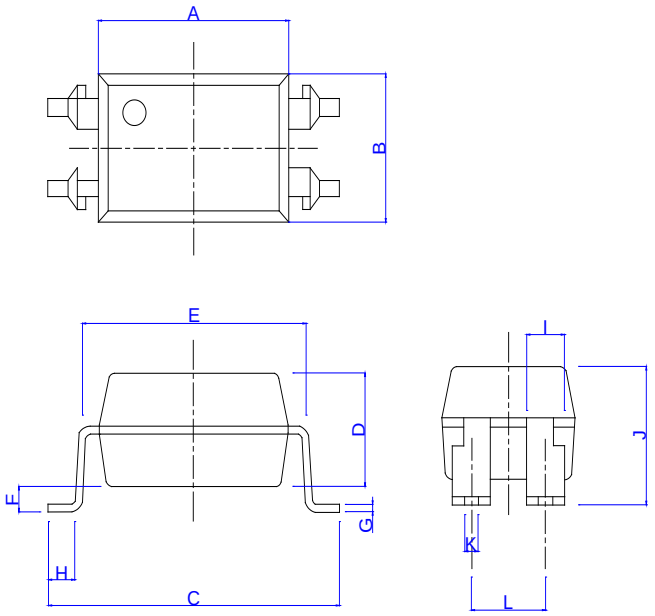
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	6.00		7.00	0.236		0.276
B	4.08		5.08	0.161		0.200
C	7.62		10.16	0.300		0.400
D	3.00		4.00	0.118		0.157
E	7.32		7.92	0.288		0.312
F	0.15		0.36	0.006		0.014
G	0.90		1.50	0.035		0.059
H	3.50		4.80	0.138		0.189
I	0.40		0.60	0.016		0.024
J	2.29		2.79	0.090		0.110
K	2.45		3.50	0.096		0.138

Option M Type:



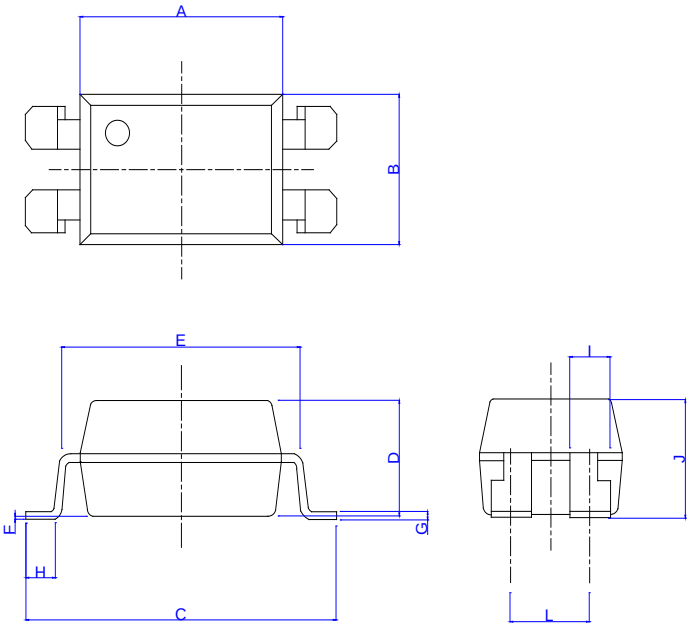
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	6.20		6.80	0.244		0.268
B	4.10		4.90	0.161		0.193
C	9.66		10.66	0.380		0.420
D	3.00		4.00	0.118		0.157
E	7.32		7.92	0.288		0.312
F	0.15		0.36	0.006		0.014
G	0.90		1.50	0.036		0.059
H	4.16		4.88	0.164		0.192
I	0.40		0.60	0.016		0.024
J	2.29		2.79	0.090		0.110
K	2.00		2.70	0.079		0.106

Option S Type:



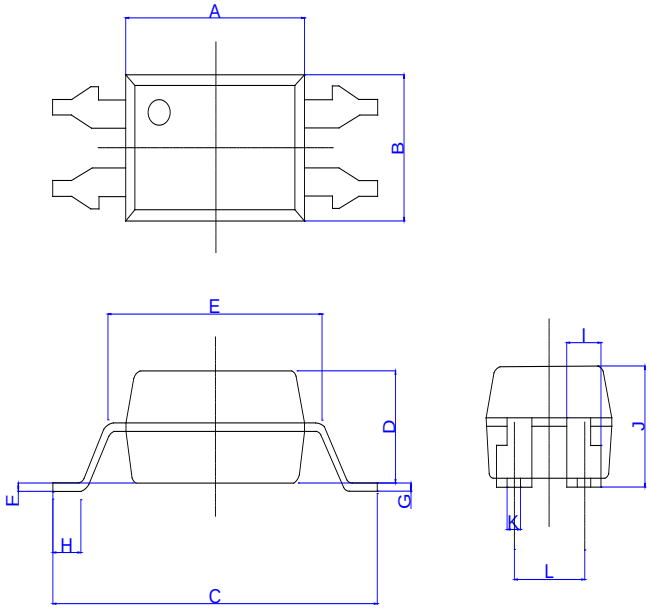
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	6.20		6.80	0.244		0.268
B	4.30		4.90	0.169		0.193
C	9.86		10.50	0.388		0.413
D	3.20		3.80	0.126		0.150
E	7.32		7.92	0.288		0.312
F	0.00		1.00	0.000		0.039
G	0.15		0.35	0.006		0.014
H	0.50		1.10	0.020		0.043
I	1.10		1.50	0.043		0.059
J	3.50		4.80	0.138		0.189
K	0.40		0.60	0.016		0.024
L	2.29		2.79	0.090		0.110

Option SL Type:



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	6.00		7.00	0.236		0.276
B	4.08		5.08	0.161		0.200
C	9.50		10.50	0.374		0.413
D	3.00		4.00	0.118		0.157
E	7.32		7.92	0.288		0.312
F	0.00		0.60	0.000		0.024
G	0.15		0.36	0.006		0.014
H	0.50		1.40	0.020		0.055
I	0.90		1.50	0.035		0.059
J	3.20		4.35	0.126		0.171
L	2.29		2.79	0.090		0.110

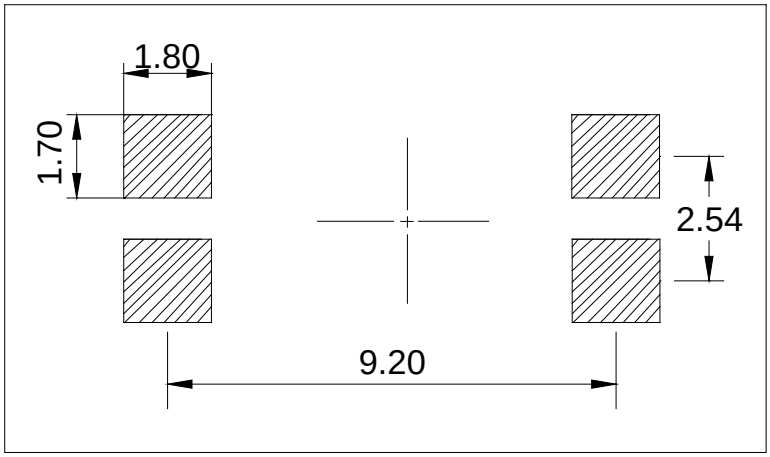
Option SLM Type:



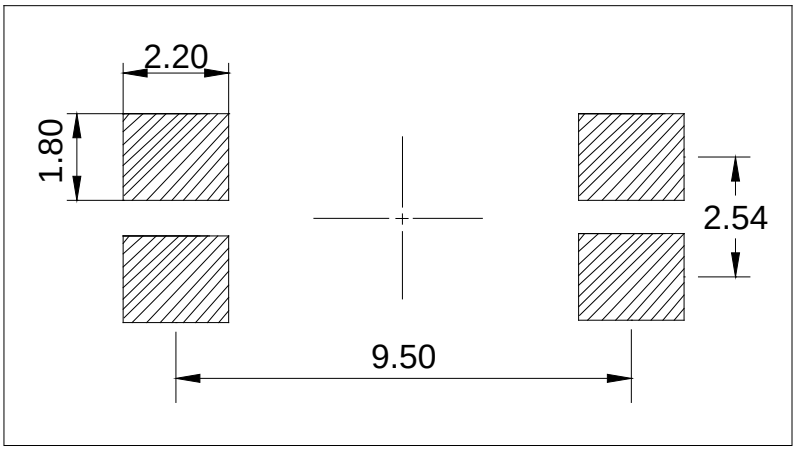
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	6.30		6.70	0.248		0.264
B	4.38		4.78	0.172		0.188
C	11.60		12.10	0.457		0.476
D	3.30		3.70	0.130		0.146
E	7.32		7.92	0.288		0.312
F	0.00		0.30	0.000		0.012
G	0.20		0.30	0.008		0.012
H	0.50		0.90	0.020		0.035
I	1.15		1.35	0.045		0.053
J	3.45		3.85	0.136		0.152
K	0.45		0.55	0.018		0.022
L	2.34		2.74	0.092		0.108

RECOMMENDED SOLDER MASK (Dimensions in mm unless otherwise stated)

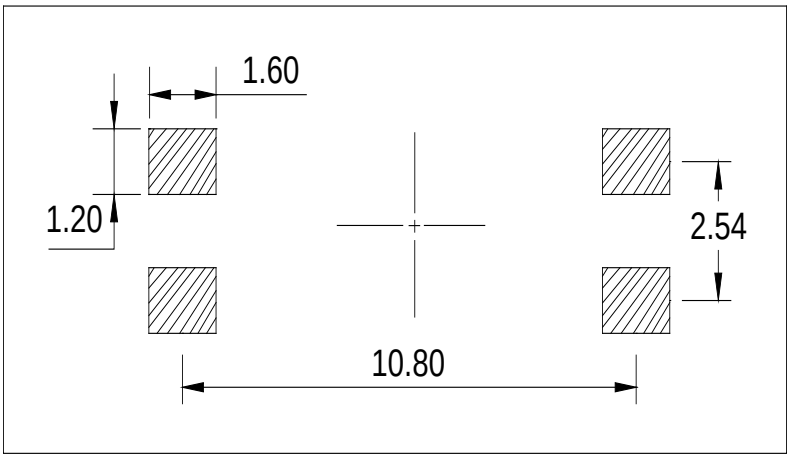
Option S



Option SL

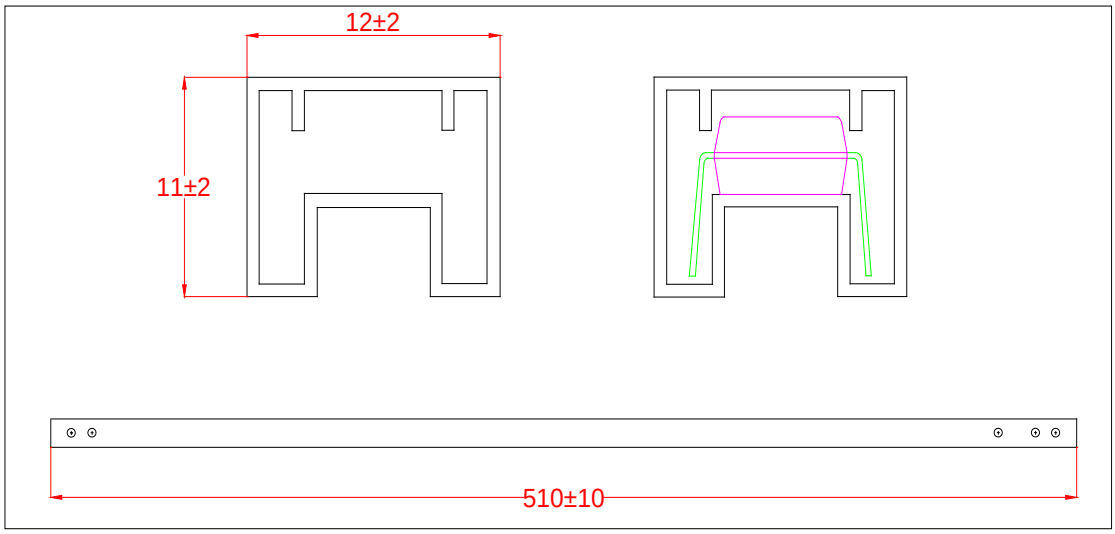


Option SLM

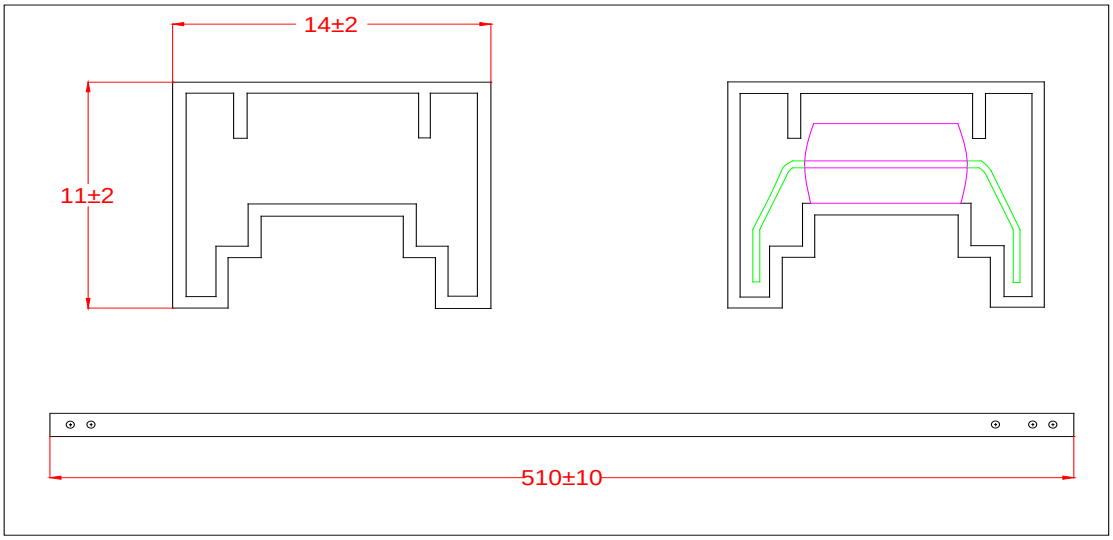


TUBE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Standard DIP

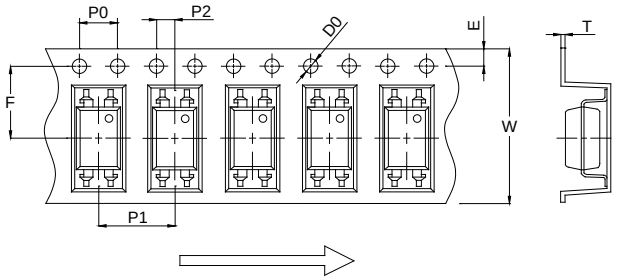


Option M

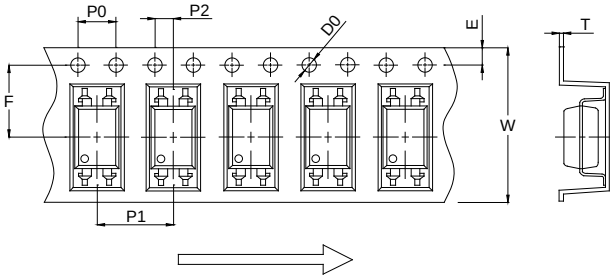


CARRIER TAPE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Option S(T1)

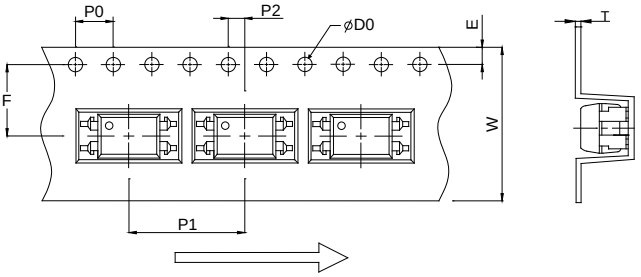


Option S(T2)

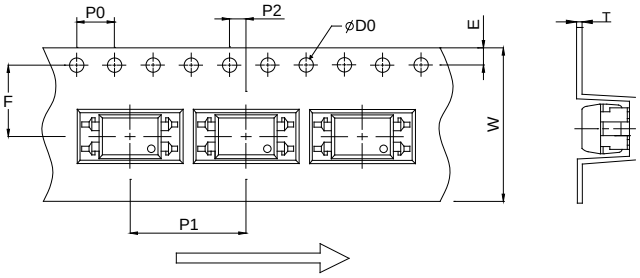


Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
D0		1.50	1.65		0.059	0.065
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.90	2.00	2.10	0.075	0.079	0.083
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
T	0.30	0.40	0.50	0.012	0.016	0.020
W	15.70	16.00	16.30	0.618	0.630	0.642

Option S(T3)

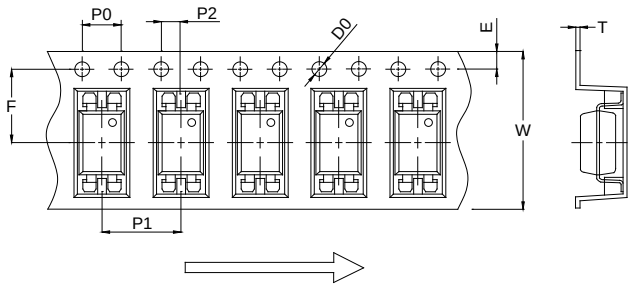


Option S(T4)

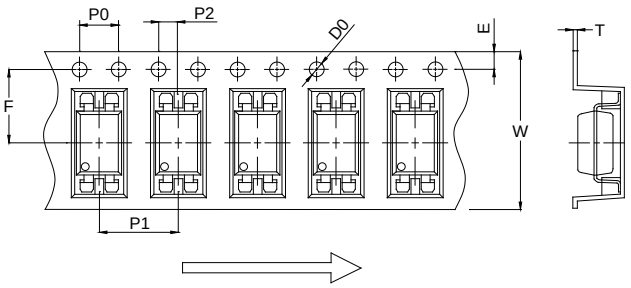


Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
D0		1.50	1.65		0.059	0.065
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	11.90	12.00	12.10	0.469	0.472	0.476
P2	1.90	2.00	2.10	0.075	0.079	0.083
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
T	0.30	0.40	0.50	0.012	0.016	0.020
W	15.70	16.00	16.30	0.618	0.630	0.642

Option SL(T1)

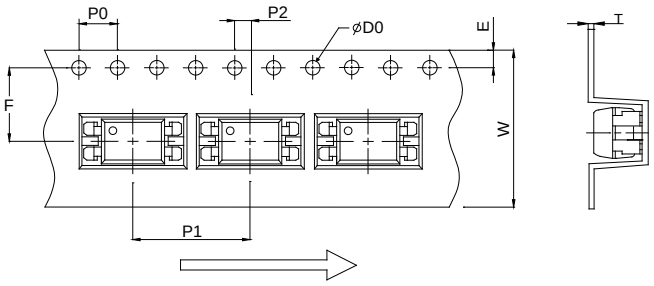


Option SL(T2)

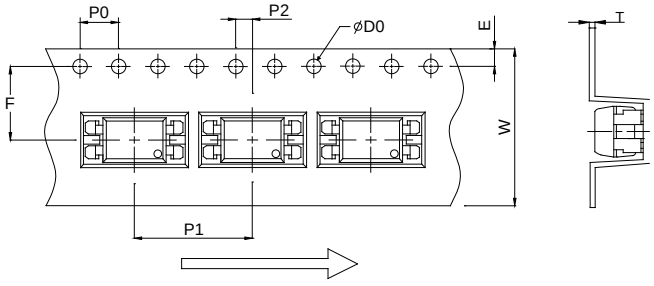


Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
D0		1.50	1.60		0.059	0.065
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.90	2.00	2.10	0.075	0.079	0.083
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
T	0.35	0.40	0.45	0.014	0.016	0.018
W	15.70	16.00	16.30	0.618	0.630	0.642

Option SL(T3)

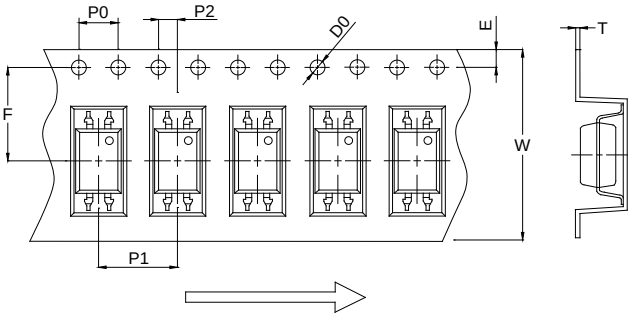


Option SL(T4)

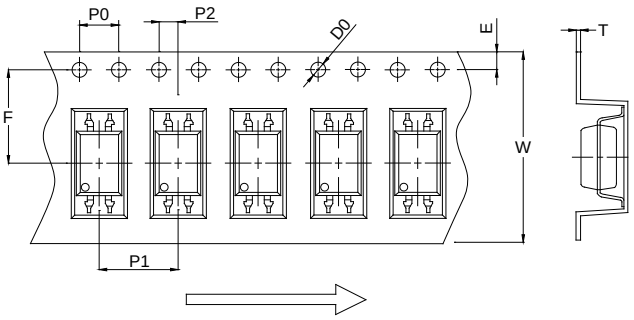


Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
D0		1.50	1.60		0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	11.90	12.00	12.10	0.469	0.472	0.476
P2	1.90	2.00	2.10	0.075	0.079	0.083
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
T	0.35	0.45	0.55	0.014	0.018	0.022
W	15.70	16.00	16.30	0.618	0.630	0.642

Option SLM(T1)

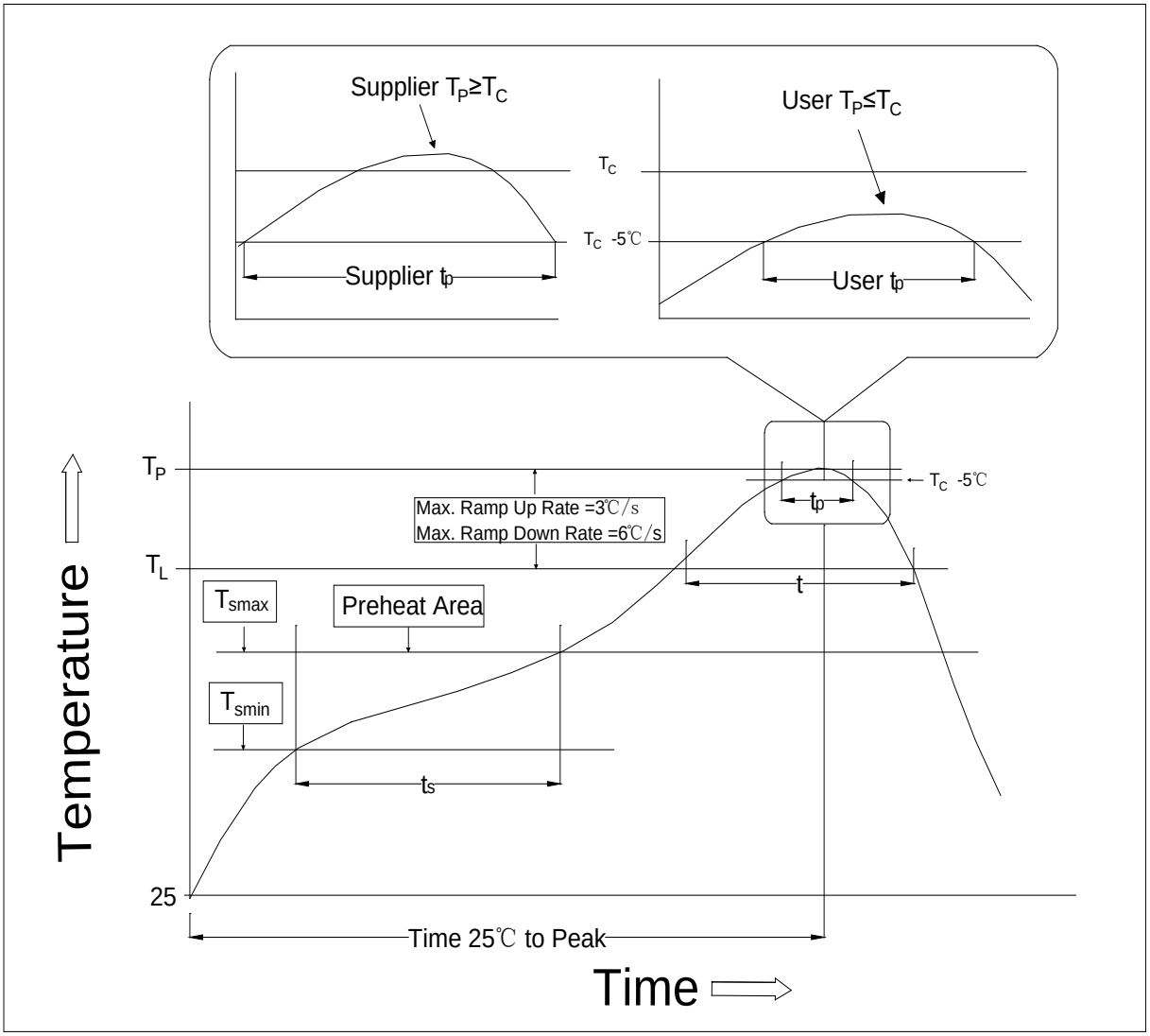


Option SLM(T2)



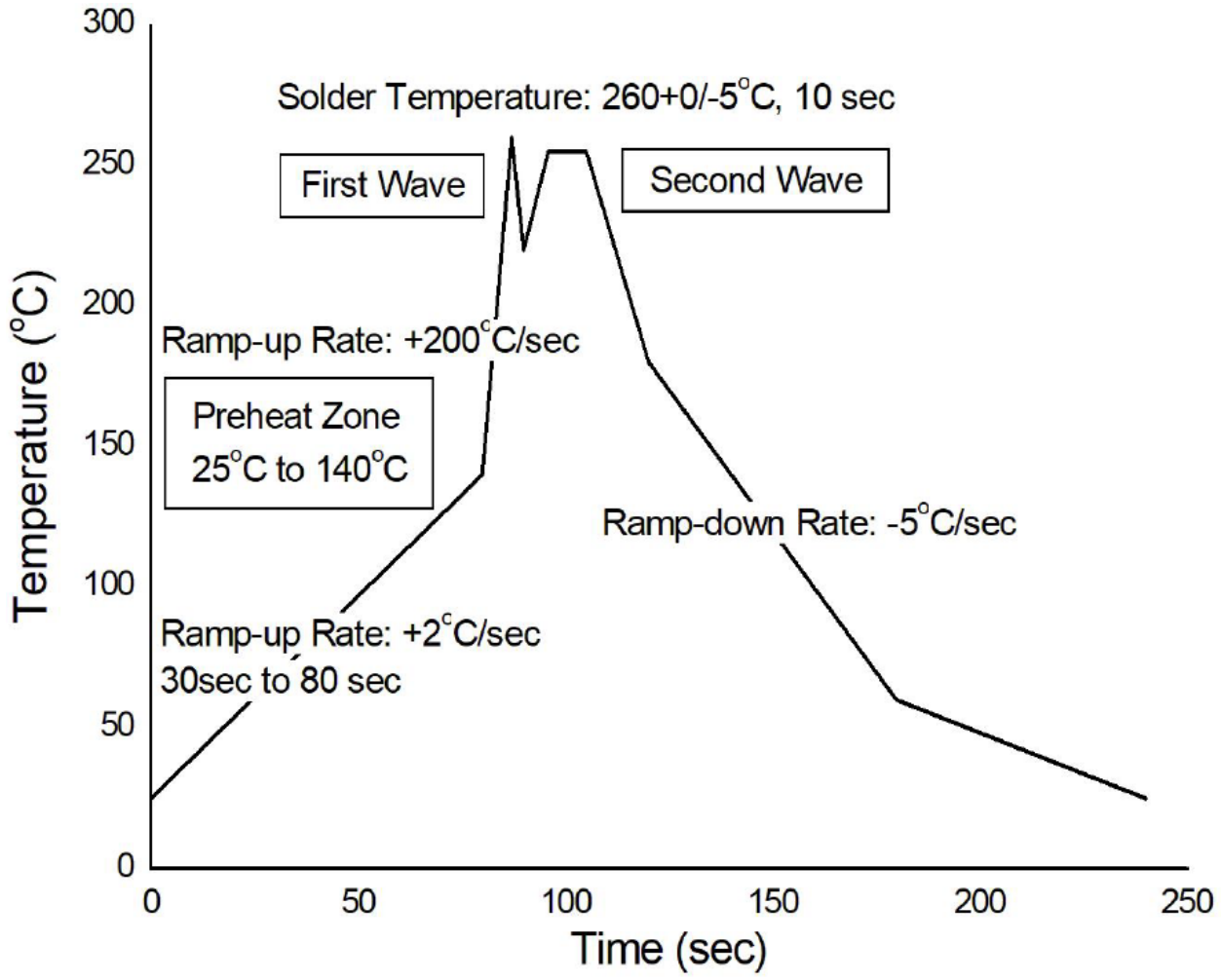
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
D0		1.50	1.60		0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.90	2.00	2.10	0.075	0.079	0.083
E	1.65	1.75	1.85	0.065	0.069	0.073
F	11.45	11.50	11.55	0.451	0.453	0.455
T	0.35	0.40	0.55	0.014	0.016	0.022
W	23.70	24.00	24.30	0.933	0.945	0.957

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.
Liquidus 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.

WAVE SOLDERING



HAND SOLDERING BY SOLDERING IRON	
Soldering Temperature	360±5℃
Soldering Time	3s max.