

DESCRIPTION:

The JOC352 combines an AlGaAs infrared emitting diode as the emitter which is optically coupled to a silicon planar darlington phototransistor detector in a plastic SOP4 package. With the robust coplanar double mold structure, JOC352 provides the most stable isolation feature. The products are widely used in sequence controller, telephone/fax, system appliances, measuring instrument and programmable logic controller.

MAIN FEATURES

High current transfer ratio (CTR $\geq$ 1000% @I_F=1mA, V_{CE}=2V)

High isolation voltage between input and output

(V_{iso}=3,750Vrms)

Operating temperature up to +110°C

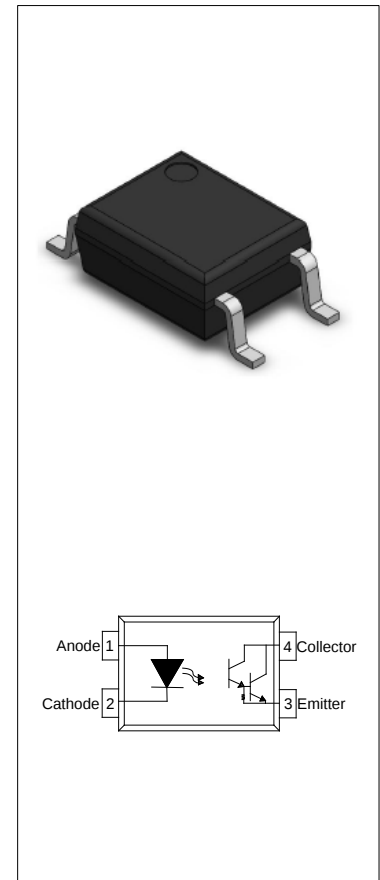
Collector-Emitter voltage BV_{CEO} $\geq$ 350V

CQC approved

VDE approved

UL approved

The products comply with 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}	1 ^①	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}	3750 ^②	Vrms
Operating Temperature		T _{opr}	-55~+110	°C

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

NOTE1: 100μs pulse, 100Hz frequency

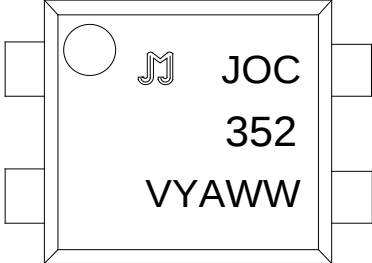
NOTE2: AC for 1minute, R.H.=40~60%

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	CTR ^①	$I_F=1mA$ $V_{CE}=2V$	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	$V_{CE}=2V$, $I_C=20mA$ $R_L=100\Omega$, -3dB	-	7	-	kHz
	Rise Time	t_r	$V_{CE}=2V$, $I_C=2mA$	-	0.3	1	μs
	Fall Time	t_f	$R_L=100\Omega$	-	30	100	μs

NOTE1: Current Transfer Ratio= $I_C/I_F \times 100\%$, Tolerance: ±3%

ORDERING AND MARKING INFORMATION

MARKING INFORMATION			
		JOC : Company Abbr. 352 : Part Number V : VDE Option Y : Fiscal Year A : Manufacturing Code WW : Work Week	
ORDERING INFORMATION			
JOC352(Z)- GV			
JOC – Company Abbr. 352 – Part Number Z – Tape and Reel Option (T1/T2) G – Green V – VDE Option (V or None)			
Packing Quantity			
Option	Quantity	Quantity – Inner box	Quantity –Outer box
T1	3000 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box =45k Units
T2	3000 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box =45k Units

Characteristics Curves

FIG.1: Forward Current vs. Ambient Temperature

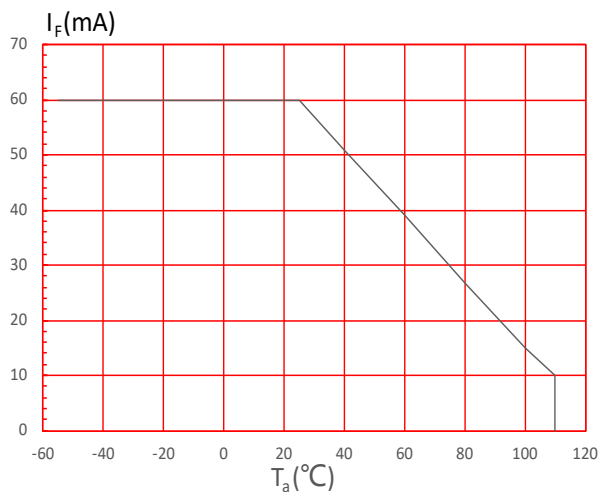


FIG.2: Collector Power Dissipation vs. Ambient Temperature

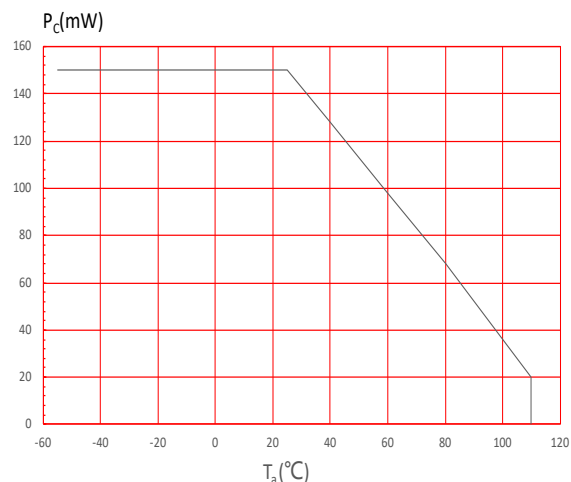


FIG.3: Forward Current vs. Forward Voltage

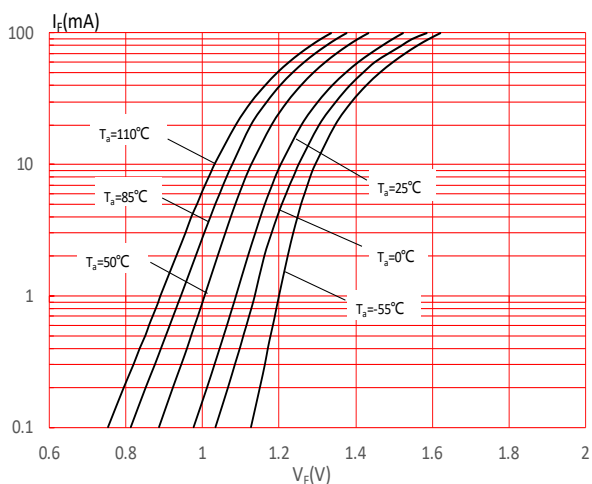


FIG.4: Normalized Collector Dark Current vs. Ambient Temperature

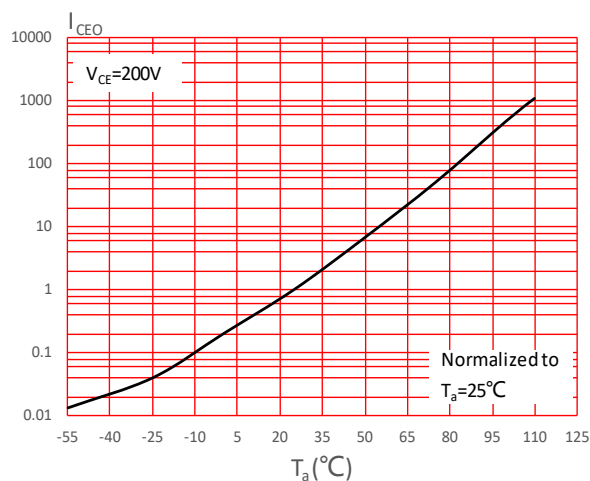


FIG.5: Collector Current vs. Collector-emitter Voltage

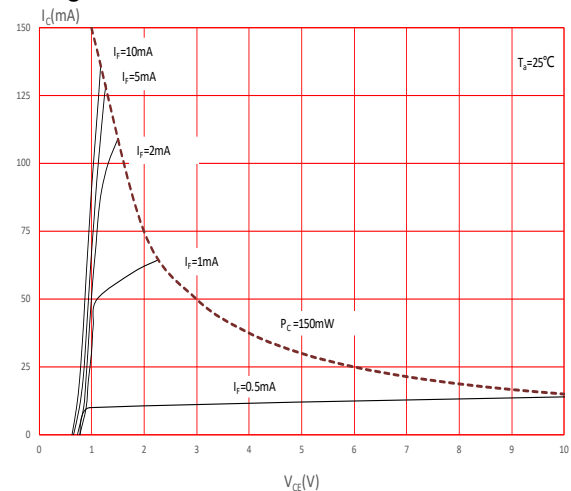


FIG.6: Normalized Current Transfer Ratio vs. Forward Current

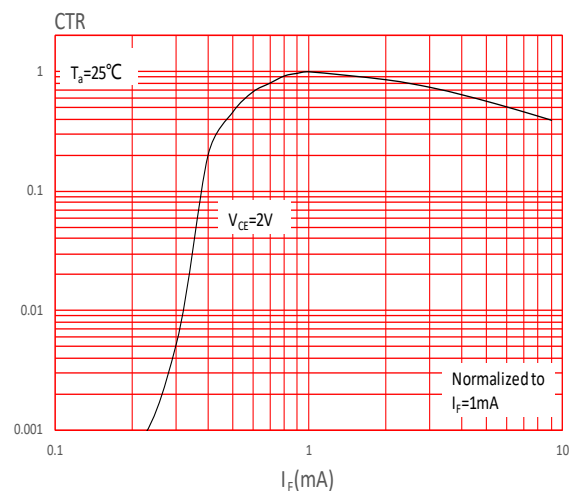
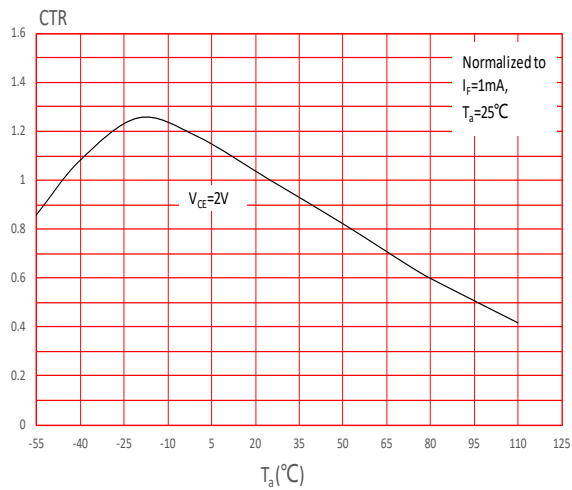
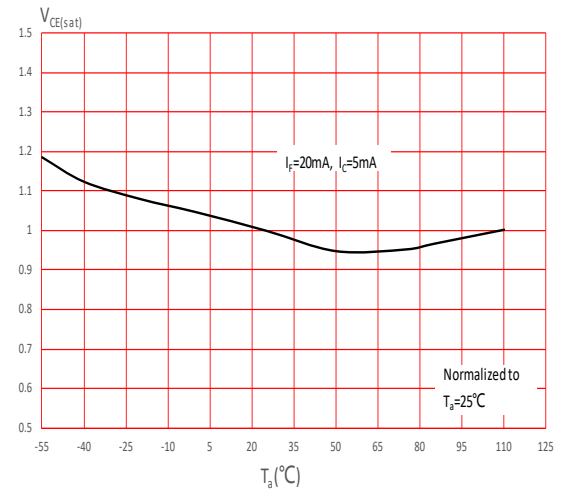
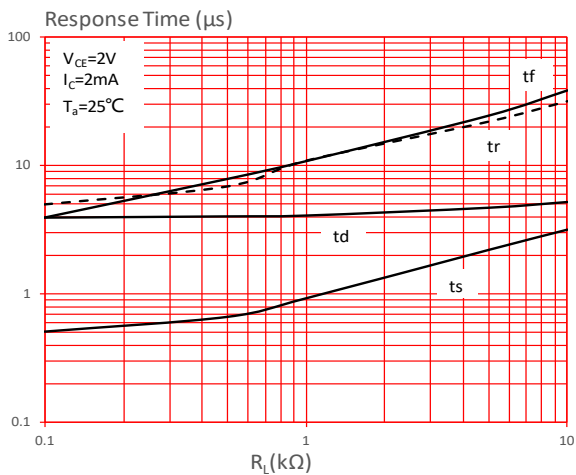
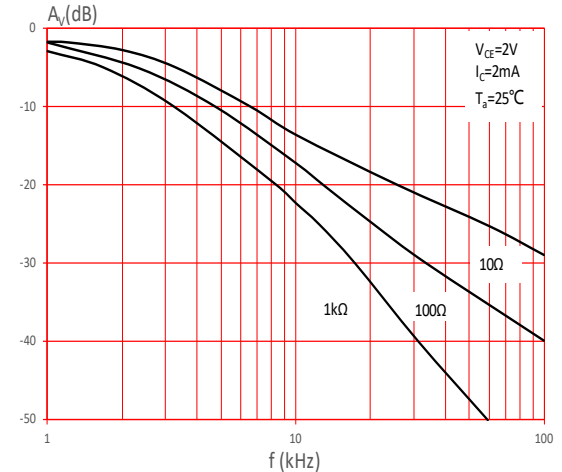
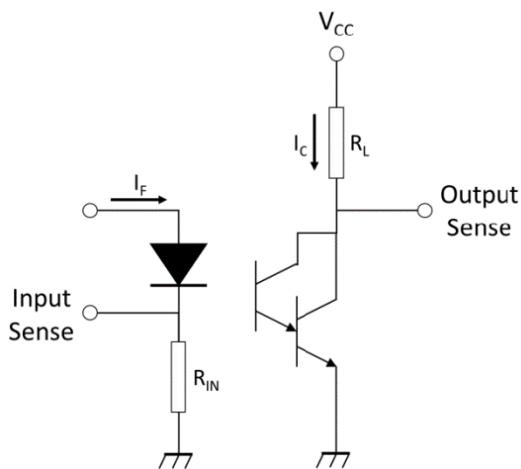
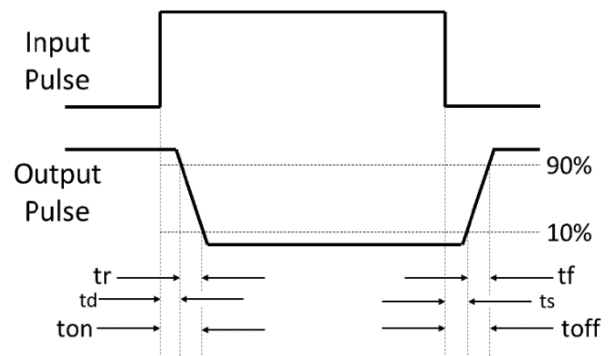
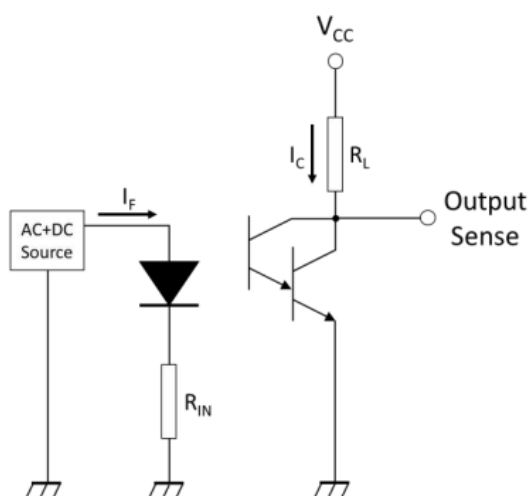
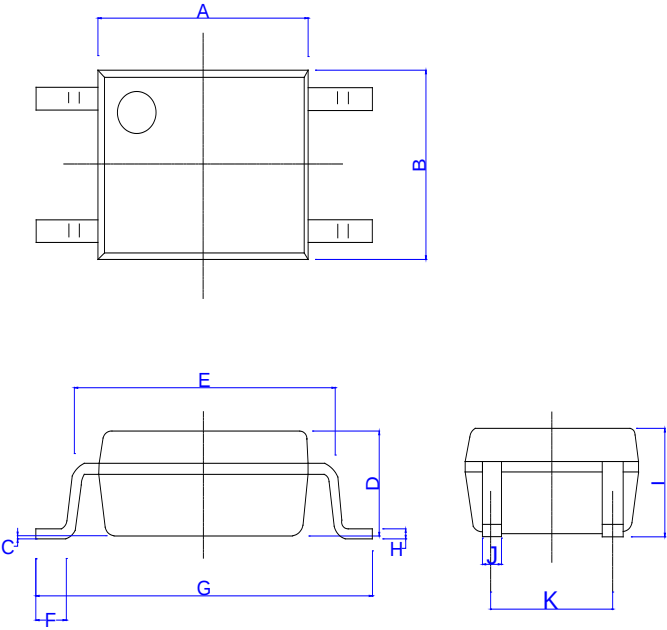


FIG.7: Normalized Current Transfer Ratio vs. Ambient Temperature

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

FIG.9: Response Time vs. Load Resistance

FIG.10: Frequency Response


Test Circuits

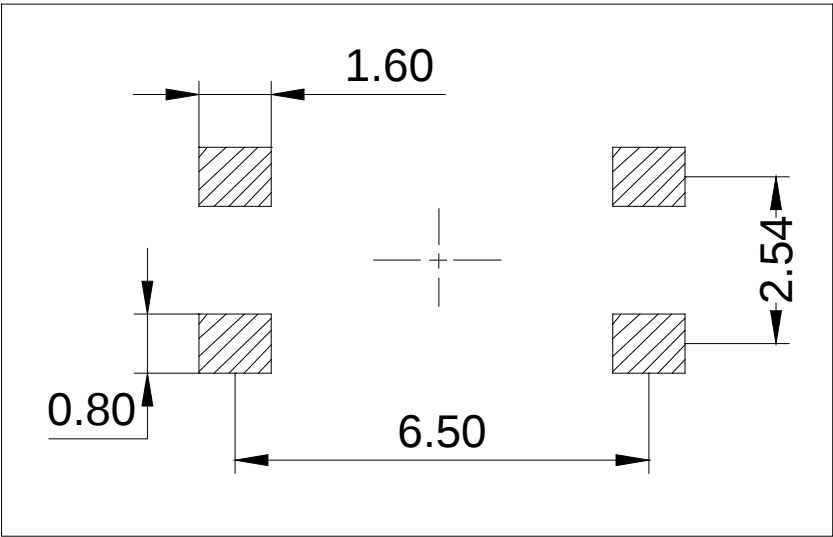
FIG.11: Test Circuits of Response Time

FIG.12: Curves of Response Time

FIG.13: Test Circuits of Frequency Response


Package Dimension (Unit: mm)



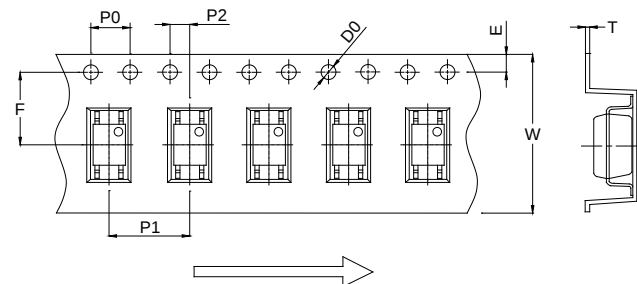
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.20		4.85	0.165		0.191
B	3.30		4.40	0.130		0.173
C	0.00		0.20	0.000		0.008
D	1.75		2.80	0.069		0.110
E	4.90		5.80	0.193		0.228
F	0.30		0.90	0.012		0.035
G	6.30		7.30	0.248		0.287
H	0.10		0.30	0.004		0.012
I	1.80		2.90	0.071		0.114
J	0.25		0.55	0.010		0.022
K	2.29		2.79	0.090		0.110

RECOMMENDED SOLDER MASK (Dimensions in mm unless otherwise stated)



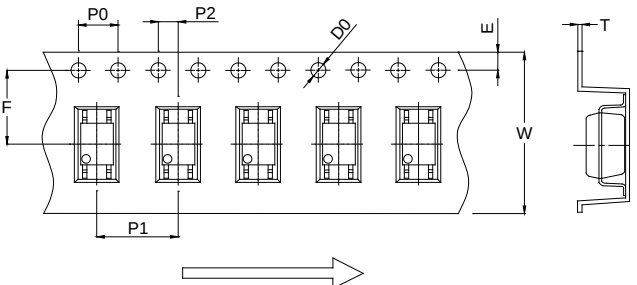
CARRIER TAPE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Option T1



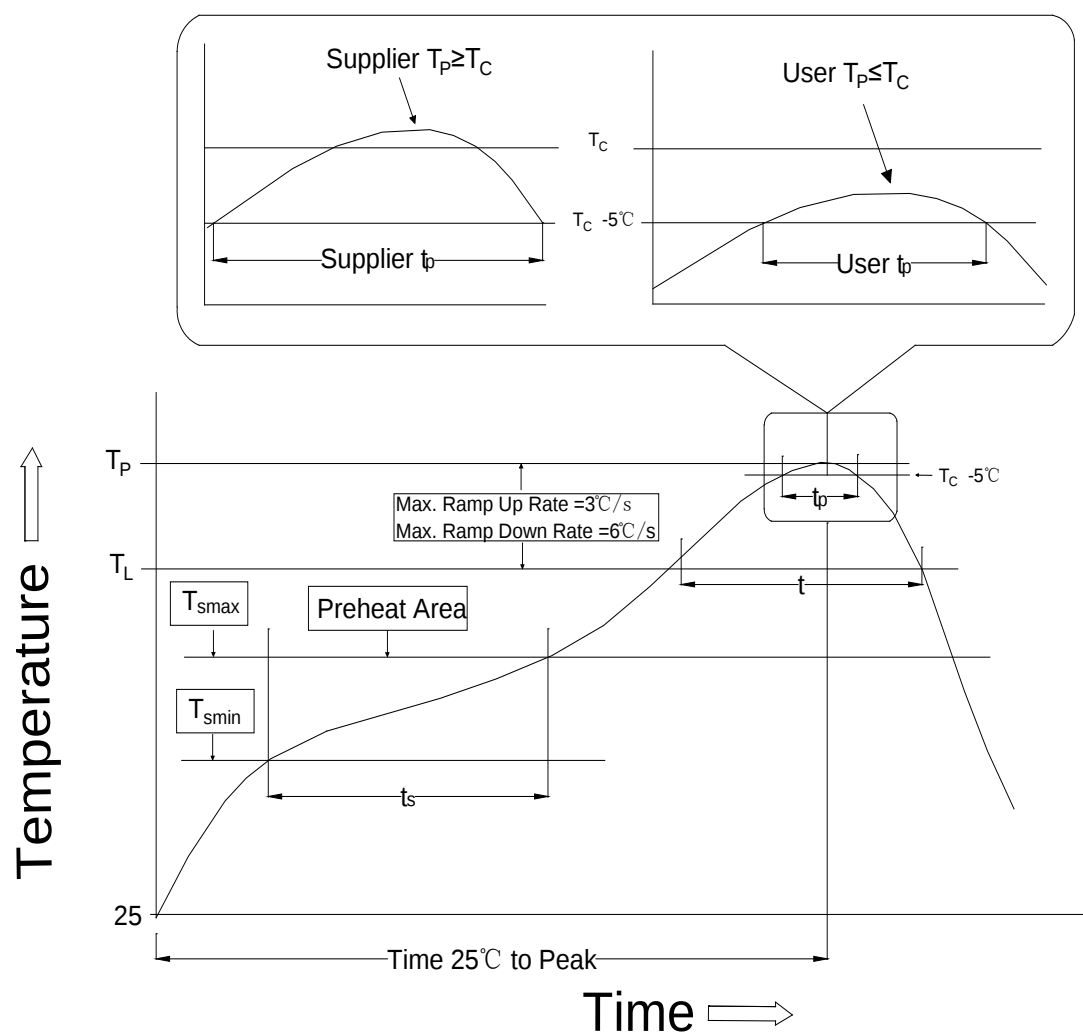
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
D0		1.45	1.65		0.057	0.065
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.90	2.00	2.10	0.075	0.079	0.083
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
T	0.15	0.30	0.45	0.006	0.012	0.018
W	15.70	16.00	16.30	0.618	0.630	0.642

Option T2



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
D0		1.45	1.65		0.057	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	0.15	0.30	0.45	0.006	0.012	0.018
W	15.70	16.00	16.30	0.618	0.630	0.642

REFLOW INFORMATION



Profile Feature	Sn-Pb Assembly Profile	Pb-Free Assembly Profile
Temperature Min. (T_{smin})	100	150°C
Temperature Max. (T_{smax})	150	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.
Liquidus 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.

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