

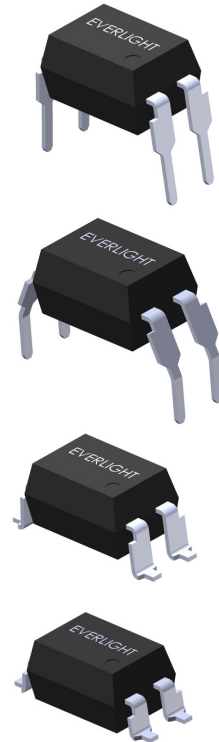
Features:

- High collector- emitter voltage ($V_{CEO}=350V$)
- Current transfer ratio
(CTR: 1000% min. at $I_F=1mA$, $V_{CE}=2V$)
- High isolation voltage between input
and output ($V_{iso}=5000 V_{rms}$)
- Creepage distance $>7.62 mm$
- Operating temperature up to $+110^{\circ}C$
- Compact small outline package
- Pb free and RoHS compliant.
- UL approval
- VDE approval
- SEMKO approval
- NEMKO approval
- DEMKO approval
- FIMKO approval
- CSA approval

Description

The EL852 series consists an infrared emitting diodes, optically coupled to a high voltage photo Darlington detector.

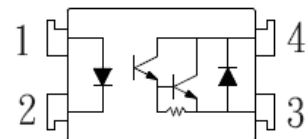
It is packaged in a 4-pin DIP package and available in wide-lead spacing and SMD option.



Applications

- Telephone set, telephone exchangers
- Sequence controllers
- System appliances, measuring instruments
- Signal transmission between circuits of different potentials and impedances

Schematic



Pin Configuration

1. Anode
2. Cathode
3. Emitter
4. Collector

4 PIN DIP HIGH VOLTAGE PHOTO DARLINGTON TRANSISTOR PHOTOCOUPLER

EL852 Series

Absolute Maximum Ratings ($T_a=25^{\circ}\text{C}$)

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	60	mA
	Peak forward current (1us, pulse)	I_{FP}	1	A
	Reverse voltage	V_R	6	V
	Power dissipation No derating required up to $T_a = 100^{\circ}\text{C}$	P_D	100	mW
Output	Power dissipation Derating factor (above $T_a = 80^{\circ}\text{C}$)	P_C	300	mW
			5.8	mW/ $^{\circ}\text{C}$
	Collector current	I_C	150	mA
	Collector-Emitter voltage	V_{CEO}	350	V
	Emitter-Collector voltage	V_{ECO}	0.1	V
Total power dissipation		P_{TOT}	320	mW
Isolation voltage ^{*1}		V_{ISO}	5000	V rms
Operating temperature		T_{OPR}	-55 ~ +100	$^{\circ}\text{C}$
Storage temperature		T_{STG}	-55 ~ +125	$^{\circ}\text{C}$
Soldering temperature ^{*2}		T_{SOL}	260	$^{\circ}\text{C}$

Notes

*1 AC for 1 minute, R.H.= 40 ~ 60% R.H. In this test, pins 1 & 2 are shorted together, and pins 3 & 4 are shorted together.

*2 For 10 seconds.

4 PIN DIP HIGH VOLTAGE PHOTO DARLINGTON TRANSISTOR PHOTOCOUPLER

EL852 Series

Electrical Characteristics ($T_a=25^{\circ}\text{C}$ unless specified otherwise)

Input

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Forward voltage	V_F	-	1.2	1.4	V	$I_F = 10\text{mA}$
Reverse current	I_R	-	-	10	μA	$V_R = 4\text{V}$
Input capacitance	C_{in}	-	30	250	pF	$V = 0, f = 1\text{kHz}$

Output

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Collector-Emitter dark current	I_{CEO}	-	-	200	nA	$V_{CE} = 200\text{V}, I_F = 0\text{mA}$
Collector-Emitter breakdown voltage	BV_{CEO}	350	-	-	V	$I_C = 0.1\text{mA}$
Emitter-Collector breakdown voltage	BV_{ECO}	0.1	-	-	V	$I_E = 0.1\text{mA}$

Transfer Characteristics ($T_a=25^{\circ}\text{C}$ unless specified otherwise)

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Current Transfer ratio	CTR	1000	-	15000	%	$I_F = 1\text{mA}, V_{CE} = 2\text{V}$
Collector-Emitter saturation voltage	$V_{CE(sat)}$	-	-	1.2	V	$I_F = 20\text{mA}, I_C = 100\text{mA}$
Isolation resistance	R_{IO}	5×10^{10}	-	-	Ω	$V_{IO} = 500\text{Vdc}$, 40~60% R.H.
Floating capacitance	C_{IO}	-	0.6	1.0	pF	$V_{IO} = 0, f = 1\text{MHz}$
Cut-off frequency	f_c	-	7	-	kHz	$V_{CE} = 2\text{V}, I_C = 20\text{mA}$ $R_L = 100\Omega, -3\text{dB}$
Rise time	t_r	-	-	300	μs	$V_{CE} = 2\text{V}, I_C = 20\text{mA}$, $R_L = 100\Omega$
Fall time	t_f	-	-	100	μs	

* Typical values at $T_a = 25^{\circ}\text{C}$

Typical Performance Curves

Figure 1. Forward Current vs. Forward Voltage

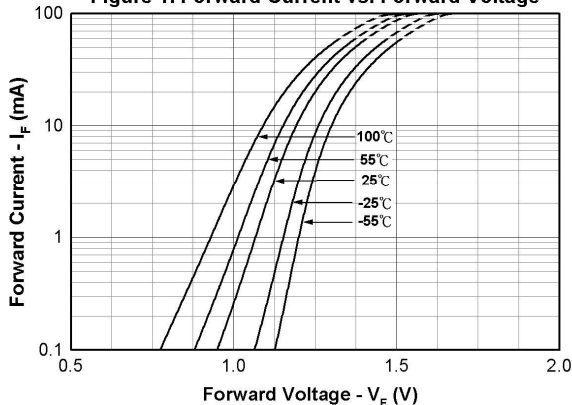


Figure 2. Collector Current vs. Collector Emitter Voltage

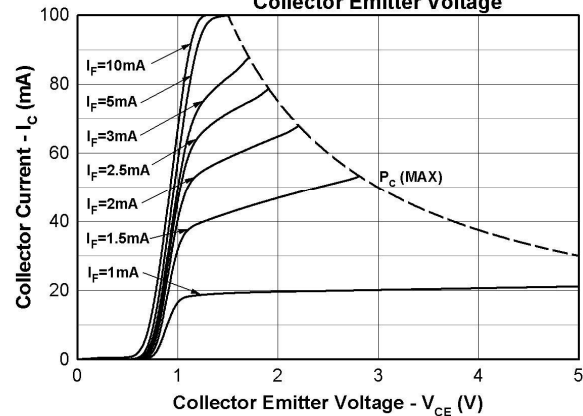


Figure 3. Collector Emitter Saturation Voltage vs. Ambient Temperature

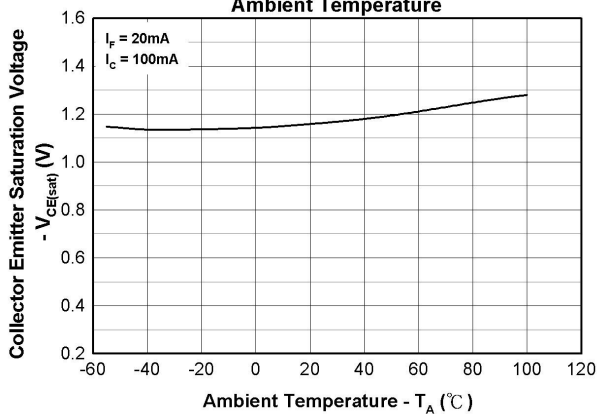


Figure 4. Collector-Emitter Saturation Voltage vs. Forward Current

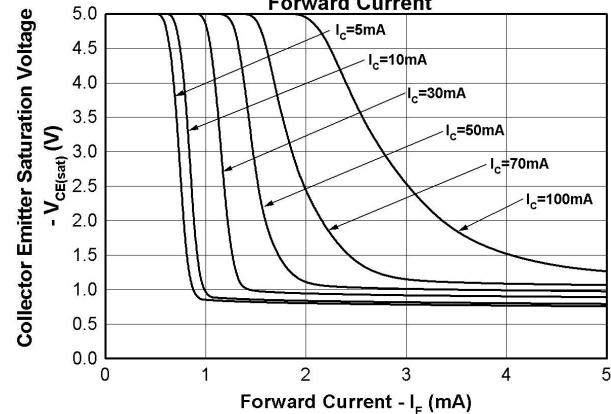


Figure 5. Current Transfer Ratio vs. Forward Current

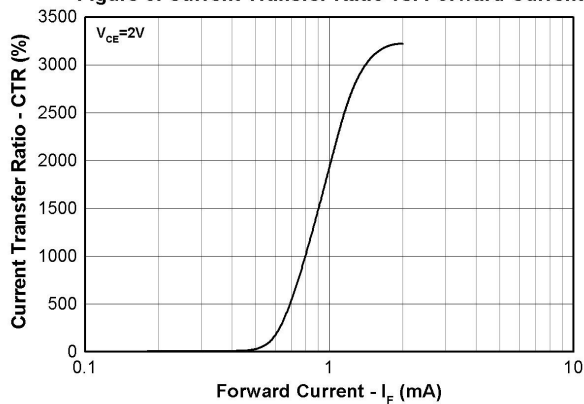


Figure 6. Normalized Current Transfer Ratio vs. Ambient Temperature

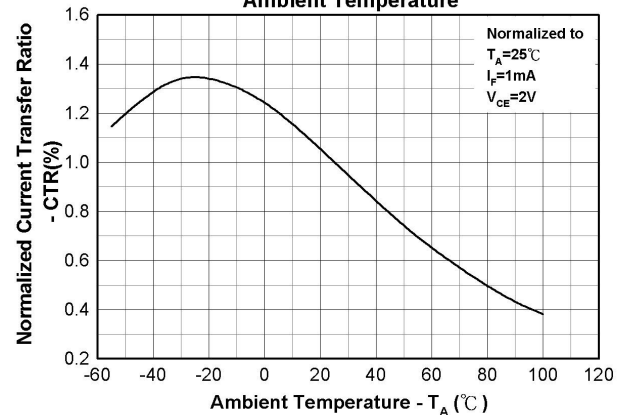


Figure 7. Collector Dark Current vs.
Ambient Temperature

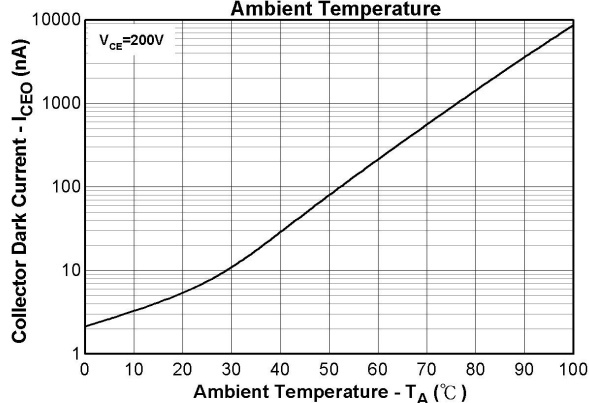


Figure 8. Response Time vs. Load Resistance

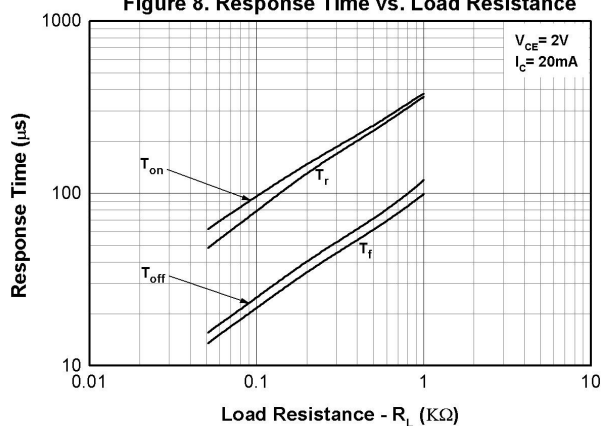
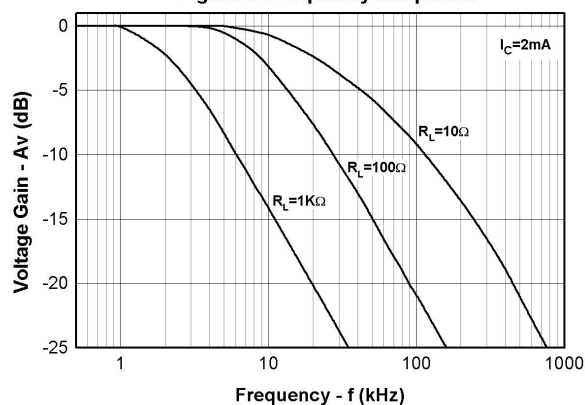


Figure 9. Frequency Response



Order Information

Part Number

EL852(X)(Y)-V

Note

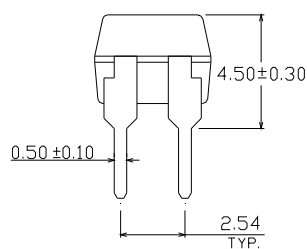
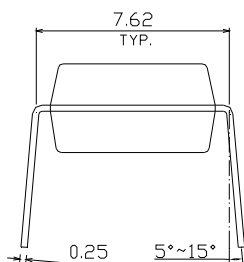
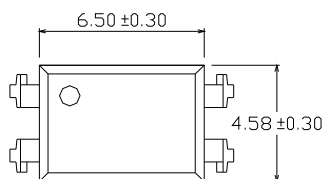
- X = Lead form option (S, S1, M or none)
Y = Tape and reel option (TA, TB, TU, TD or none).
V = VDE safety (optional).

Option	Description	Packing quantity
None	Standard DIP-4	100 units per tube
M	Wide lead bend (0.4 inch spacing)	100 units per tube
S (TA)	Surface mount lead form + TA tape & reel option	1000 units per reel
S (TB)	Surface mount lead form + TB tape & reel option	1000 units per reel
S1 (TA)	Surface mount lead form (low profile) + TA tape & reel option	1000 units per reel
S1 (TB)	Surface mount lead form (low profile) + TB tape & reel option	1000 units per reel
S (TU)	Surface mount lead form + TU tape & reel option	1500 units per reel
S (TD)	Surface mount lead form + TD tape & reel option	1500 units per reel
S1 (TU)	Surface mount lead form (low profile) + TU tape & reel option	1500 units per reel
S1 (TD)	Surface mount lead form (low profile) + TD tape & reel option	1500 units per reel

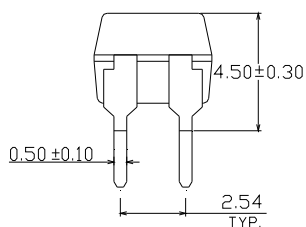
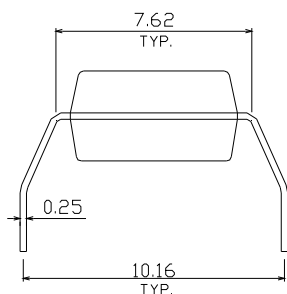
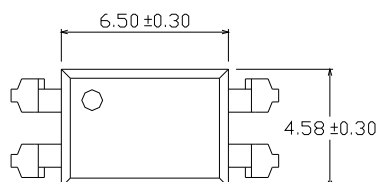
Package Drawing

(Dimensions in mm)

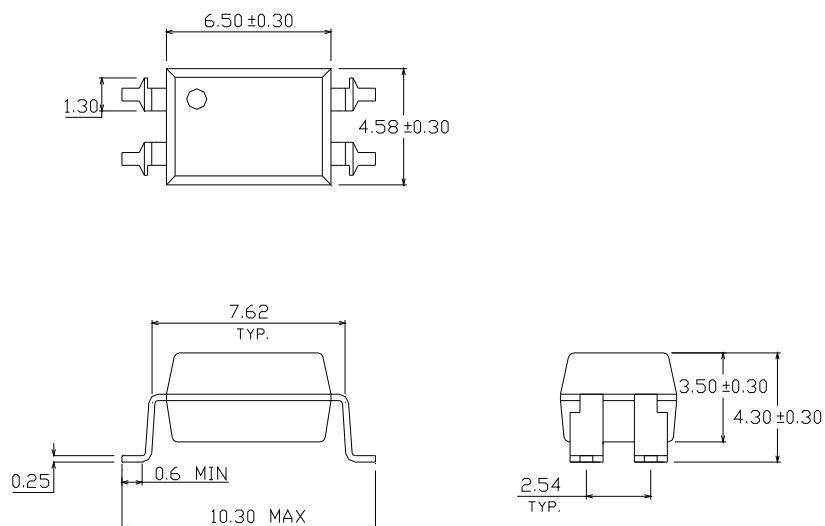
Standard DIP Type



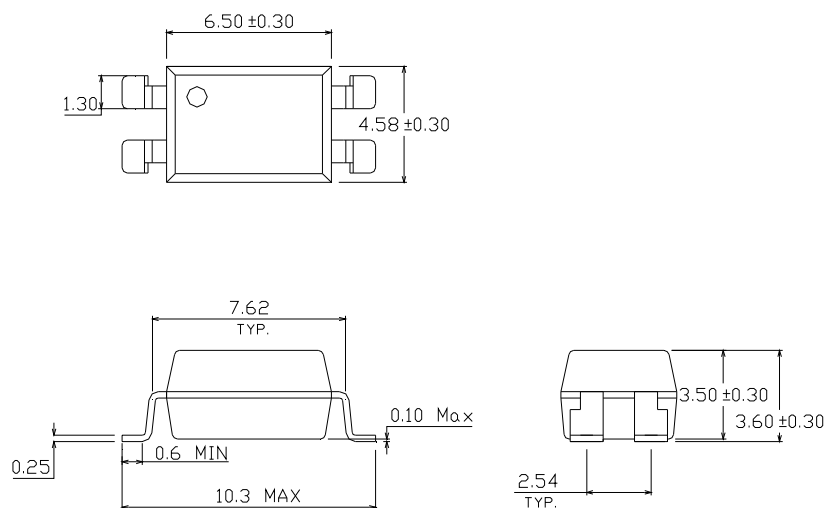
Option M Type



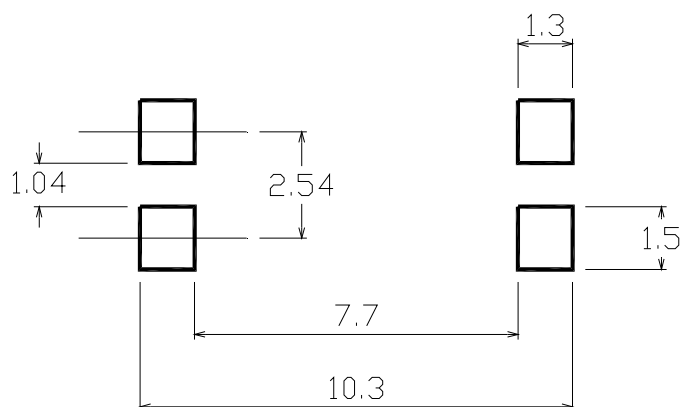
Option S Type



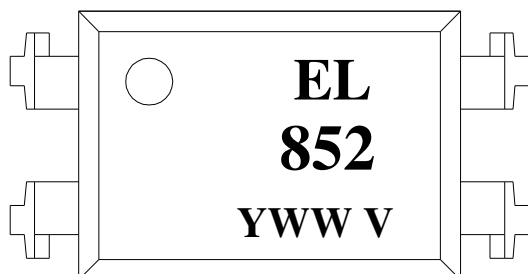
Option S1 Type



Recommended pad layout for surface mount leadform



Device Marking

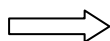
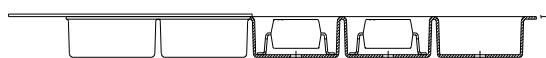
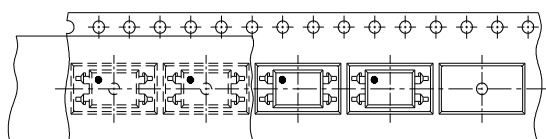


Notes

EL	denotes EVERLIGHT
815	denotes Device Number
Y	denotes 1 digit Year code
WW	denotes 2 digit Week code
V	denotes VDE (optional)

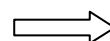
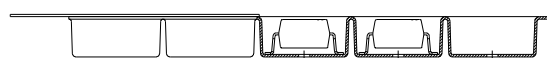
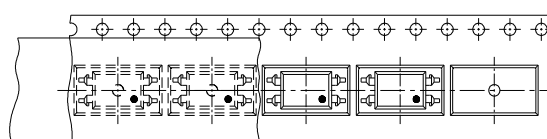
Tape & Reel Packing Specifications

Option TA



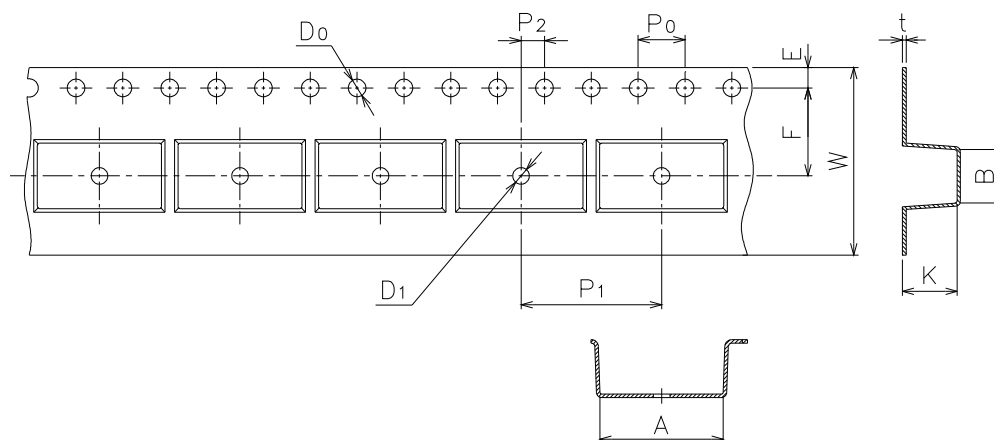
Direction of feed from reel

Option TB



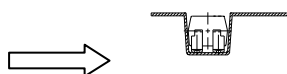
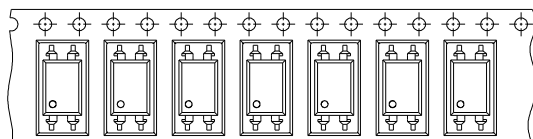
Direction of feed from reel

Tape dimensions



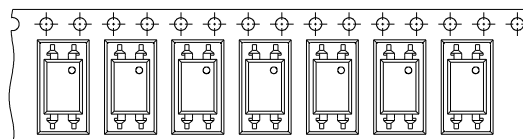
Dimension No.	A	B	Do	D1	E	F
Dimension(mm)	10.4±0.1	4.55±0.1	1.5±0.1	1.5±0.05	1.75±0.1	7.5±0.1
Dimension No.	Po	P1	P2	t	W	K
Dimension(mm)	4.0±0.1	12.0±0.1	2.0±0.1	0.33±0.1	16.0+0.3/ -0.1	4.55±0.1

Option TD



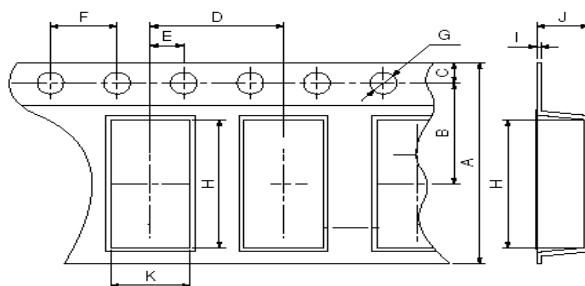
Direction of feed from reel

Option TU



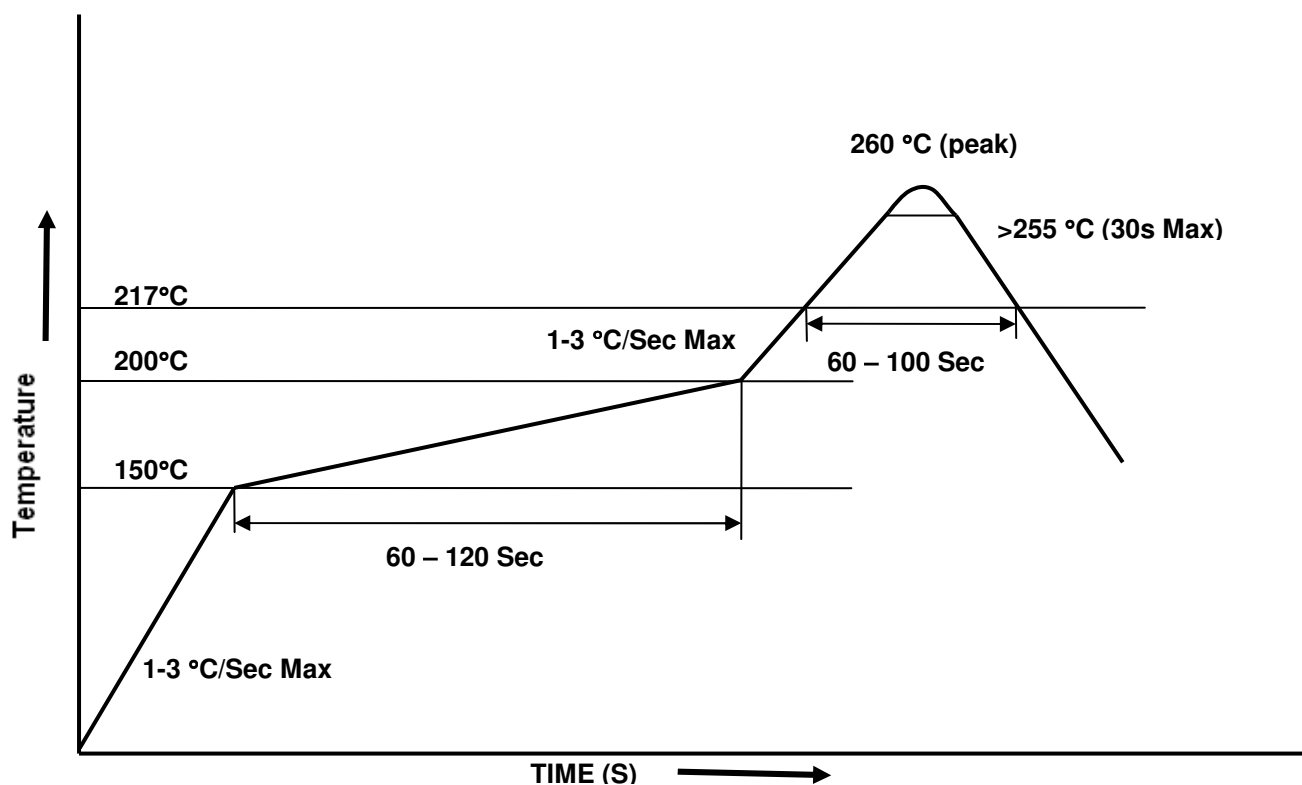
Direction of feed from reel

Tape dimensions



Dimension No.	A	B	C	D	E	F
Dimension(mm)	16.00±0.3	7.5±0.1	1.75±0.1	8.0±0.1	2.0±0.1	4.0±0.1
Dimension No.	G	H	I	J	K	
Dimension(mm)	1.5+0.1/-0	10.4±0.1	0.4±0.05	4.55±0.1	5.1±0.1	

Solder Reflow Temperature Profile



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