



●FEATURE

1. Power supply PWM circuit input / output inductor
2. Power line noise suppression
3. DC-DC Converter
4. Shielding Structure for good in EMI effect
5. To help you go pass CE/FCC standard
6. Low Profile for all compact design
7. Operating Temperature: -40 ~ +125°C
8. Compliant with AEC-Q200



●APPLICATION

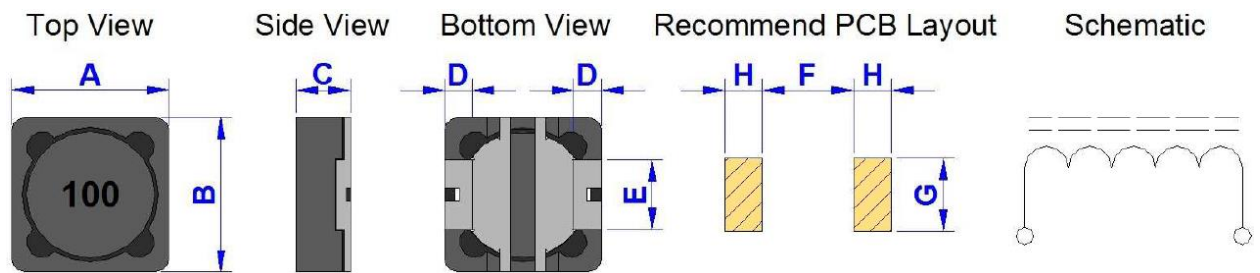
MB, NB, IPC, LCD Monitor, STB, Network Device

●ORDERING INFORMATION

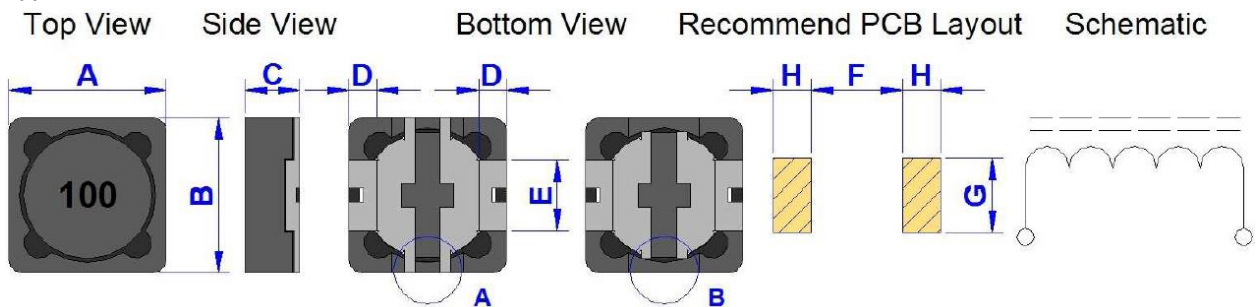
<u>WSS</u>	<u>7045</u>	<u>U</u>	<u>-1R0</u>	<u>T</u>	<u>Q</u>
Series	Dimension (L*W*H)	Material code	Impedance (Ω)	Tolerance K=10%,M±20%,Y=±30%	AEC-Q

●SHAPE AND DIMENSION

Type: 7045



Type: 12560, 12565



**A vs B different shape.
Does not affect the characteristics and use all acceptable !**

●SPECIFICATION

Unit: mm

Type	A	B	C	D	E	F	G	H
7045	7.80 Max.	7.80 Max	4.50 Max	1.25±0.30	1.98±0.30	4.40 Ref.	2.40 Ref.	1.65 Ref.
12560	12.50 Max.	12.50 Max.	6.00 Max.	2.25±0.30	5.00±0.50	7.00 Ref.	5.60 Ref.	2.80 Ref.
12565	12.50 Max.	12.50 Max.	8.00 Max.	2.25±0.30	5.00±0.50	7.00 Ref.	5.60 Ref.	2.80 Ref.



● ELECTRICAL CHARACTERISTICS

Part Number	Inductance (μ H)	Tolerance (T)	RDC ($m\Omega$ /Typ.)	RDC ($m\Omega$ /Max.)	Isat 1 @ L-Drop 10% (Amp / Max.)	Isat 2 @ L-Drop 35% (Amp / Max.)	Irms @ $\Delta T=40^\circ\text{C}$ (Amp / Max.)
WSS7045-1R0T	1.0	M / Y	10.9	13.2	9.50	10.50	8.40
WSS7045-1R5T	1.5	M / Y	12.5	15.0	7.90	9.50	7.80
WSS7045-1R8T	1.8	M / Y	14.1	17.0	7.70	8.60	7.30
WSS7045-2R2T	2.2	M / Y	16.1	19.0	6.80	7.50	6.60
WSS7045-2R7T	2.7	M / Y	18.9	23.0	6.30	7.00	6.20
WSS7045-3R3T	3.3	M / Y	22.2	27.0	6.00	6.50	5.80
WSS7045-3R9T	3.9	M / Y	25.2	30.0	5.40	6.00	5.40
WSS7045-4R7T	4.7	M / Y	27.7	34.0	5.00	5.50	5.20
WSS7045-5R6T	5.6	M / Y	34.8	42.0	4.10	5.00	4.80
WSS7045-6R8T	6.8	M / Y	40.0	48.0	3.80	4.50	4.50
WSS7045-8R2T	8.2	M / Y	48.0	58.0	3.60	4.10	4.30
WSS7045-100T	10.0	M	55.6	67.0	2.55	3.50	4.00
WSS7045-120T	12.0	M	63.2	76.0	2.50	3.40	3.80
WSS7045-150T	15.0	M	79.0	95.0	2.40	3.30	3.50
WSS7045-180T	18.0	M	97.4	117.0	2.10	2.90	3.20
WSS7045-220T	22.0	M	114.0	136.0	2.00	2.60	3.00
WSS7045-270T	27.0	M	123.0	147.0	1.90	2.40	2.80
WSS7045-330T	33.0	M	152.0	182.0	1.65	2.10	2.40
WSS7045-390T	39.0	M	164.0	196.0	1.55	2.00	2.20
WSS7045-470T	47.0	M	200.0	240.0	1.50	1.82	2.00
WSS7045-560T	56.0	M	250.0	300.0	1.35	1.60	1.78
WSS7045-680T	68.0	M	290.0	350.0	1.25	1.50	1.65
WSS7045-820T	82.0	M	390.0	470.0	1.10	1.30	1.50
WSS7045-101T	100.0	M	490.0	590.0	1.00	1.18	1.30
WSS7045-121T	120.0	M	600.0	720.0	0.90	1.10	1.15
WSS7045-151T	150.0	M	770.0	920.0	0.75	0.90	1.00
WSS7045-181T	180.0	M	860.0	1030.0	0.74	0.86	0.95
WSS7045-221T	220.0	M	1050.0	1250.0	0.70	0.77	0.85
WSS7045-271T	270.0	M	1300.0	1560.0	0.63	0.70	0.78
WSS7045-331T	330.0	M	1620.0	1940.0	0.59	0.65	0.72
WSS7045-391T	390.0	M	2100.0	2500.0	0.50	0.59	0.65
WSS7045-471T	470.0	M	2340.0	2800.0	0.45	0.54	0.60
WSS7045-561T	560.0	M	3000.0	3600.0	0.42	0.50	0.56
WSS7045-681T	680.0	M	3350.0	4020.0	0.40	0.44	0.48
WSS7045-821T	820.0	M	3800.0	4560.0	0.35	0.40	0.44
WSS7045-102T	1000.0	M	5044.0	6050.0	0.28	0.35	0.38
WSS7045-152T	1500.0	M	-	6800.0	-	-	0.30
WSS7045-202T	2000.0	M	-	10200.0	-	-	0.30
WSS7045-103T	10000.0	M	-	63800.0	-	-	0.10

* Value test frequency: 1.0~8.2 μ H @ 100KHz / 0.3V; 10~1000 μ H @ 1KHz / 0.3V

* T=Tolerance: Y= \pm 30%, M= \pm 20%

* The Isat1 is the current at which the inductance decreases by 10% from the initial value

* The Isat2 is the current at which the inductance decreases by 35% from the initial value

* The Irms by Stand-Type is the current at which the temperature rise is $\Delta T \leq 40^\circ\text{C}$, whichever ($T_A = 20^\circ\text{C}$).



Part Number	Inductance (uH)	Tolerance (T)	RDC (mΩ/Typ.)	RDC (mΩ/Max.)	Isat 1 @ L-Drop 10% (Amp / Max.)	Isat 2 @ L-Drop 35% (Amp / Max.)	Irms @ΔT=40 °C (Amp / Max.)
WSS12560-2R2T	2.2	Y	10.00	13.00	15.00	16.00	9.00
WSS12560-2R7T	2.7	Y	5.00	8.00	13.00	14.00	9.00
WSS12560-3R3T	3.3	M / Y	9.70	15.00	12.20	13.20	8.20
WSS12560-3R9T	3.9	M / Y	10.70	16.00	11.00	12.20	7.80
WSS12560-4R7T	4.7	M / Y	11.40	17.00	10.50	11.30	7.50
WSS12560-5R6T	5.6	M / Y	14.00	18.00	9.40	10.00	6.70
WSS12560-6R8T	6.8	M / Y	15.30	20.00	8.50	9.30	6.40
WSS12560-8R2T	8.2	M / Y	16.60	22.00	7.50	8.40	6.10
WSS12560-100T	10.0	M	18.60	24.00	7.00	8.00	5.75
WSS12560-120T	12.0	M	21.80	28.00	6.60	7.50	5.30
WSS12560-150T	15.0	M	24.00	30.00	6.00	6.60	5.00
WSS12560-180T	18.0	M	29.40	37.00	5.40	6.00	4.70
WSS12560-220T	22.0	M	33.50	42.00	4.80	5.50	4.40
WSS12560-270T	27.0	M	40.50	51.00	4.50	5.00	4.00
WSS12560-330T	33.0	M	50.30	63.00	4.00	4.50	3.63
WSS12560-390T	39.0	M	62.00	78.00	3.50	4.00	3.20
WSS12560-470T	47.0	M	69.00	87.00	3.30	3.60	3.00
WSS12560-560T	56.0	M	83.00	104.00	3.00	3.30	2.70
WSS12560-680T	68.0	M	98.00	125.00	2.75	3.00	2.50
WSS12560-820T	82.0	M	116.00	145.00	2.40	2.70	2.20
WSS12560-101T	100.0	M	143.00	180.00	2.30	2.55	1.90
WSS12560-121T	120.0	M	166.00	210.00	2.00	2.30	1.70
WSS12560-151T	150.0	M	211.00	270.00	1.85	2.05	1.50
WSS12560-181T	180.0	M	246.00	310.00	1.65	1.85	1.35
WSS12560-221T	220.0	M	293.00	370.00	1.50	1.75	1.25
WSS12560-271T	270.0	M	380.00	470.00	1.38	1.58	1.10
WSS12560-331T	330.0	M	460.00	580.00	1.25	1.40	1.00
WSS12560-391T	390.0	M	550.00	680.00	1.15	1.30	0.92
WSS12560-471T	470.0	M	660.00	820.00	1.05	1.20	0.83
WSS12560-561T	560.0	M	770.00	960.00	0.98	1.08	0.76
WSS12560-681T	680.0	M	950.00	1200.00	0.88	0.98	0.69
WSS12560-821T	820.0	M	1120.00	1400.00	0.78	0.88	0.64
WSS12560-102T	1000.0	M	1550.00	1940.00	0.68	0.78	0.56

* Value test frequency: 1.0~8.2uH @ 100KHz / 0.3V; 10~1000uH @ 1KHz / 0.3V

* T=Tolerance: Y=±30%, M=±20%

* The Isat1 is the current at which the inductance decreases by 10% from the initial value

* The Isat2 is the current at which the inductance decreases by 35% from the initial value

* The Irms by Stand-Type is the current at which the temperature rise is ΔT≤40°C, whichever (T_A=20°C).



Part Number	Inductance (uH)	Tolerance (T)	RDC (mΩ/Typ.)	RDC (mΩ/Max.)	Isat 1 @ L-Drop 10% (Amp / Max.)	Isat 2 @ L-Drop 35% (Amp / Max.)	Irms @ΔT=40 °C (Amp / Max.)
WSS12565-R68T	0.68	Y	4.50	5.85	20.00	26.00	11.00
WSS12565-1R0T	1.0	Y	4.50	5.85	20.00	21.00	11.00
WSS12565-1R5T	1.5	Y	4.80	7.80	19.00	20.00	10.50
WSS12565-2R2T	2.2	M / Y	6.50	8.45	19.00	20.00	10.00
WSS12565-3R3T	3.3	M / Y	7.59	10.00	18.00	19.00	9.60
WSS12565-4R7T	4.7	M / Y	9.75	13.00	14.50	16.60	8.20
WSS12565-5R6T	5.6	M / Y	12.50	15.50	13.50	15.00	7.60
WSS12565-6R8T	6.8	M / Y	13.40	16.80	12.70	13.50	7.35
WSS12565-8R2T	8.2	M / Y	15.40	19.00	11.30	12.50	6.50
WSS12565-100T	10.0	M	18.70	23.50	10.00	11.50	6.10
WSS12565-120T	12.0	M	19.60	25.00	9.50	10.50	5.50
WSS12565-150T	15.0	M	27.50	34.00	8.60	9.50	5.00
WSS12565-180T	18.0	M	29.70	38.00	7.80	8.60	4.80
WSS12565-220T	22.0	M	36.60	45.80	7.00	7.70	4.60
WSS12565-270T	27.0	M	41.90	52.50	6.35	7.00	4.20
WSS12565-330T	33.0	M	51.60	62.00	5.45	6.30	3.80
WSS12565-390T	39.0	M	59.70	72.00	5.30	6.00	3.50
WSS12565-470T	47.0	M	72.00	87.00	5.00	5.50	3.10
WSS12565-560T	56.0	M	90.00	110.00	4.50	5.00	2.90
WSS12565-680T	68.0	M	108.00	130.00	4.00	4.30	2.70
WSS12565-820T	82.0	M	123.00	148.00	3.60	4.00	2.50
WSS12565-850T	85.0	K	137.00	165.00	3.30	3.60	-
WSS12565-101T	100.0	M	152.00	182.00	3.20	3.50	2.20
WSS12565-121T	120.0	M	170.00	204.00	3.10	3.40	2.00
WSS12565-151T	150.0	M	226.00	270.00	2.90	3.20	1.80
WSS12565-181T	180.0	M	283.00	340.00	2.50	2.80	1.60
WSS12565-221T	220.0	M	348.00	420.00	2.25	2.50	1.45
WSS12565-271T	270.0	M	397.00	480.00	2.00	2.30	1.30
WSS12565-331T	330.0	M	500.00	600.00	1.90	2.00	1.20
WSS12565-391T	390.0	M	560.00	670.00	1.70	1.90	1.10
WSS12565-471T	470.0	M	657.00	800.00	1.55	1.70	1.00
WSS12565-561T	560.0	M	820.00	1000.00	1.45	1.60	0.90
WSS12565-681T	680.0	M	990.00	1200.00	1.30	1.45	0.80
WSS12565-821T	820.0	M	1260.00	1500.00	1.20	1.30	0.70
WSS12565-102T	1000.0	M	1530.00	1820.00	1.09	1.20	0.60
WSS12565-222T	2200.0	K / M	3050.00	3660.00	0.70	0.80	0.42
WSS12565-332T	3300.0	K / M	4250.00	5100.00	0.45	0.55	0.35
WSS12565-682T	6800.0	M	9130.00	10950.00	0.30	0.30	0.24

* Value test frequency: 1.0~8.2uH @ 100KHz / 0.3V; 10~6800uH @ 1KHz / 0.3V

* T=Tolerance: Y=±30%, M=±20%, K=±10%.

* The Isat1 is the current at which the inductance decreases by 10% from the initial value

* The Isat2 is the current at which the inductance decreases by 35% from the initial value

* The Irms by Stand-Type is the current at which the temperature rise is ΔT≤40°C, whichever (T_A=20°C).



●RELIABILITY

Test Item	Test Condition	Specification												
Dimension	Actual Size ...	Meet Spec												
Thermal Shock (Temperature Cycle)	Temperature: -40 ~ +125°C kept stabilized for 30 min. each Cycle: 100 Cycles (power off)	Elec. no variation Appearance no deformation												
Humidity Resistance	Humidity: 90% ~ 95% RH Temperature: 60 ± 2°C Test Time: 96 ± 2 Hours	Elec. no variation Appearance no deformation												
High Temperature	Temperature: 125 ± 2°C Testing Time: 96 ± 2 Hours	Elec. no variation Appearance no deformation												
Low Temperature	Temperature: -40 ± 2°C Time: 96 ± 2 Hours	Elec. no variation Appearance no deformation												
Temperature and Humidity Cycle	<table border="1"> <thead> <tr> <th>Temperature</th> <th>Humidity</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>25°C</td> <td>90% ~ 95% RH</td> <td>3.0 Hr</td> </tr> <tr> <td>55°C</td> <td>95% ~ 96% RH</td> <td>5.0 Hr</td> </tr> <tr> <td>25°C</td> <td>90% ~ 95% RH</td> <td>3.0 Hr</td> </tr> </tbody> </table>	Temperature	Humidity	Time	25°C	90% ~ 95% RH	3.0 Hr	55°C	95% ~ 96% RH	5.0 Hr	25°C	90% ~ 95% RH	3.0 Hr	Elec. no variation Appearance no deformation
	Temperature	Humidity	Time											
	25°C	90% ~ 95% RH	3.0 Hr											
	55°C	95% ~ 96% RH	5.0 Hr											
25°C	90% ~ 95% RH	3.0 Hr												
Cycle: 20 Cycles														
Vibration	Frequency: 10Hz ~ 55Hz , Amplitude: 1.5 mm Direction: X, Y, Z, Time: 2 Hours each	Elec. no variation Appearance no deformation												
Solderability	Go through real SMT IR-Reflow The profile like our suggest profile. Preheat: 160 ± 10°C (90 sec) Peak: 245 ± 5°C Peak Time: 50 Sec. / up 217°C	Elec. no variation Appearance no deformation												
Soldering Heat Resistance	Preheat: 160 ± 10°C (90 sec) Solder: Sn / Ag / Cu (Pb Free) Solder Temp.: 260 ± 5°C, Time: 3 ± 1 seconds	Elec. no variation Appearance no deformation												
Iron Solder Heat Resistance	Solder Temp.: 350 ± 5°C Flux: Rosin, Time: 3 ± 1 seconds	Elec. no variation Appearance no deformation												
Bending Strength	<p>Unit : mm</p> <p>Force : 1Kg / min.</p>	Elec. no variation Appearance no deformation												
Flexure Strength	<p>Unit : mm</p> <p>Solder cream 0.15 mm</p>	Elec. no variation Appearance no deformation												
Terminal Strength	<p>Mount on PCB Solder Cream 0.15 mm</p> <p>Push 10N force to X , Y direction</p>	Elec. no variation Appearance no deformation												
High-Voltage	100 V DC between core & winding	Elec. no variation Appearance no deformation												
Load life	Temperature: 25 ± 3°C Load: Allowed DC Current, Test Time: 96 ± 2 Hours	Elec. no variation Appearance no deformation												



● **TEST EQUIPMENT**

- 1. HP4284A, HP42841A - L, Q, DCR, IDC
- 2. HP8753D Network analyzer – SRF

● **OPERATING & STORAGE CONDITION**

- 1. Operating Temp: -40 ~ +125°C (Including self - temperature rise)
- 2. Storage Temp: a. Product with Taping: -10 ~ 45°C, 50 ~ 60% RH
b. On Board: -40 ~ +125°C
- 3. Storage Life Time: 6 Month (Less than 40°C and 60% RH)

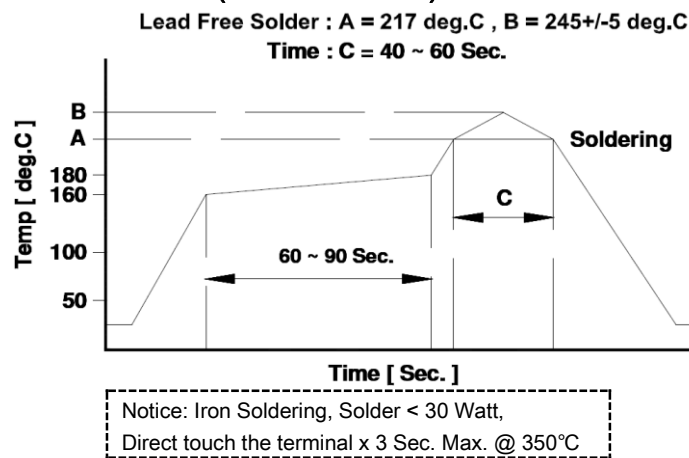
Standard Atmosphere Conditions:

Ambient Temperature 20 ± 15°C; Humidity RH 65 ± 20%

If there may be any doubt on the test result, Measurement shall be made within the following limits:

Ambient Temperature 25 ± 5°C; Humidity RH 75 ± 10%

● **RECOMMEND REFLOW CURVE (TIME: Second)**



● **ATTENTION & CAUTION:**

- * Keep out of Splashing water or salt water
- * Avoid Toxic Gas (Hydrogen sulfide, Sulfurous acid, Chlorine, Ammonia)
- * Vibrations or shocks which exceed the specified condition
- * Dew condense
- * Layout near the edge of PCB
- * Over flexure after SMT mounting & PCBA
- * Pin foot or SMD pad solder ability: Pb free type is best within 6 months after delivery
- * Humidity sensitive, IPC/JEDEC J-STD-020 MSL if over Level 1, recommend bake 30mins@150°C before PCBA
- * Caution for human life relative applications: PLS contact & consult with AiT team in design stage.



Care Note for Use:

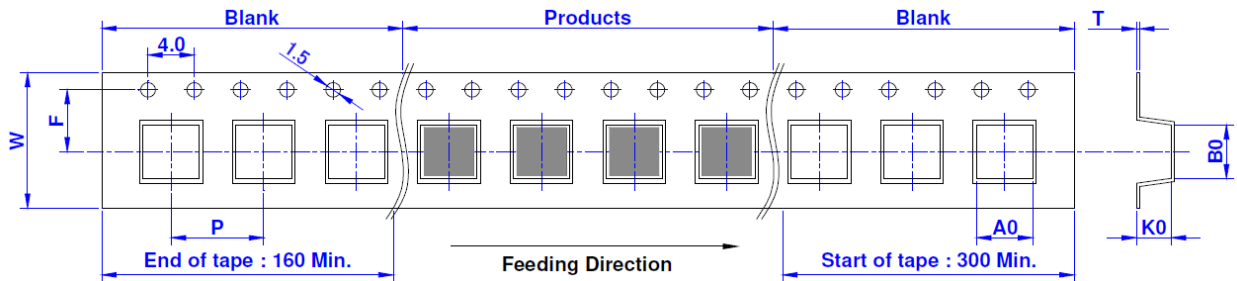
- (1) Storage Condition:
Temperature 25 to 35°C, Humidity 45 to 60% RH
- (2) Use Temperature:
 - a. Minimum Temperature: -40°C Ambient temperature of this product.
 - b. Maximum Temperature: +125°C The value of temperature including ambient and temperature rise of this product.
 - c. Reliability test temperature range from -40 ~ +125°C
 - d. However, this is not meant as temperature grade guarantee for UL.
- (3) Model:
When this product was used in a similar or as new product to the original one, sometimes it might be unable to satisfy the specifications due to difference in condition of usage.
- (4) Drop:
If this product suffered mechanical stress such as drop, characteristics may become poor (due to damage on coil / bobbin / ferrite ... etc.)
Never use such stressed product.

Care Note for Safety:

- (1) Provision to Abnormal Condition:
This product itself does not have any protective function in abnormal condition such as overload, short-circuit and open-circuit conditions, etc.
Therefore, it shall be confirmed from the end product that there is no risk of smoking, fire, dielectric withstand voltage insulation resistance, etc. in abnormal conditions to provide protective devices and /or protection circuit in the end product.
- (2) Temperature Rise:
Temperature rise on this product depends on the installation condition on end products.
It shall be confirmed on the actual end product that temperature rise of this product is within the specified temperature class limit.
- (3) Dielectric Strength:
Dielectric withstanding test with higher voltage than specific value will damage insulating material and shorten its life.
- (4) Water:
This product must not be used in wet condition resulted from water, coffee or any liquid contact because insulation strength becomes very low under such condition.
- (5) Potting:
If this product is potted in some compound, coating material of magnet wire might be occasionally damaged. Please ask us if you intend to pot this product.
- (6) Detergent:
Please consult AiT Semi immediately once under such circumstances because product reliability confirmation etc. is needed when this product come in contact with these chemicals.

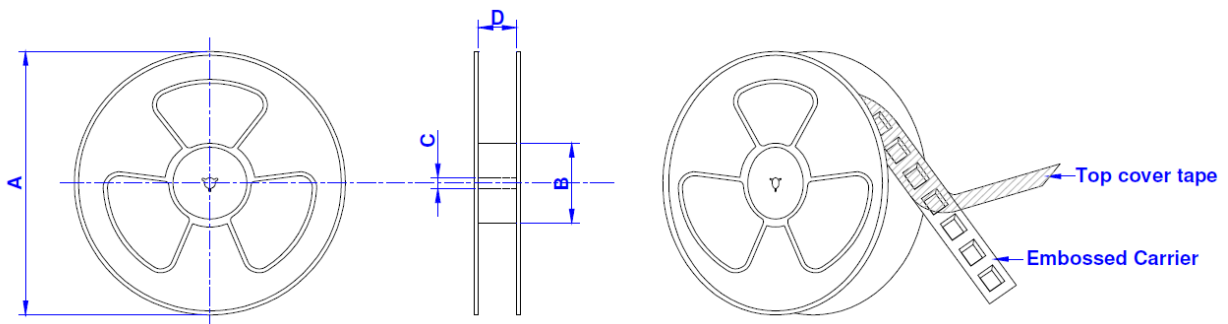


●TAPE DIMENSION: mm



SIZE/mm	W	P	A0	B0	K0	T	F
7045	16.00	12.00	7.60	7.60	4.50	0.40	7.50
12560	24.00	16.00	12.60	12.60	5.90	0.40	11.50
12565	24.00	16.00	12.60	12.60	8.20	0.40	11.50

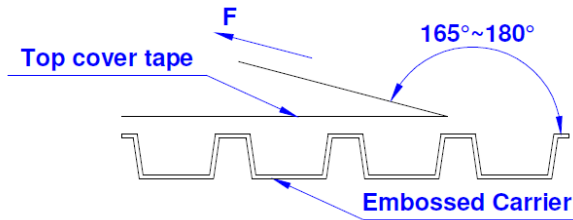
●REEL DIMENSION: mm



SIZE / mm	REEL SIZE	A	B	C	D	QTY/REEL
7045	13" x 16 mm	330	100	13	16.5	1000 PCS
12560	13" x 24 mm	330	100	13	24.5	500 PCS
12565	13" x 24 mm	330	100	13	24.5	500 PCS



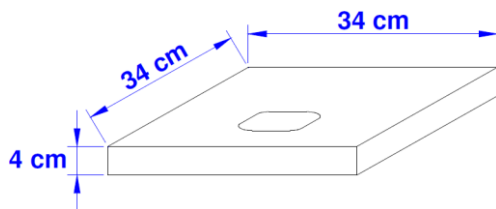
●TEARING OFF FORCE:



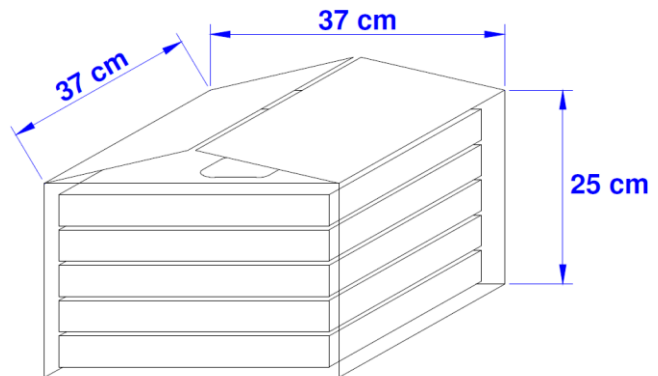
The force for tearing off cover tape is 10 to 130 grams in the arrow direction under the following conditions (referenced ANSI/EIA - 481 - D - 2008 of 4.11 standard).

Room Temp. (°C)	Room Humidity (%)	Room Atm. (hPa)	Tearing Speed (mm / min)
5 ~ 35	45 ~ 85	860~1060	300

●BOX PACKAGE: cm



13" Small Box



Large Box

SIZE/mm	Reels in Small Box	Small Box in Large Box
7045	1	5
12560	1	5
12565	1	5



IMPORTANT NOTICE

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