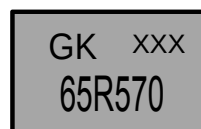


Features

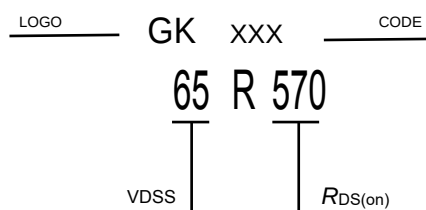
Ultra low $R_{DS(on)}$
Ultra low gate charge (typ. $Q_g=14nC$)
100% UIS tested
RoHS compliant

V_{DSS} 650 V
 I_D 7.2 A
 $R_{DS(ON)}$ 0.57 Ω

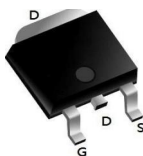


Applications

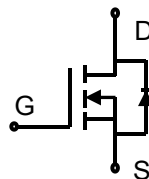
Power factor correction (PFC).
Switched mode power supplies (SMPS).
Uninterruptible power supply (UPS).



TO-252



Equivalent Circuit



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings (@ $T = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	650	V
Continuous drain current ¹⁾ ($T_C = 25^\circ\text{C}$) ($T_C = 100^\circ\text{C}$)	I_D	7.2	A
		4.5	A
Pulsed drain current ²⁾	I_{DM}	21.6	A
Gate-Source voltage	V_{GSS}	± 30	V
Avalanche energy, single pulse ³⁾	E_{AS}	120	mJ
Power Dissipation	P_D	80	W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$
Continuous diode forward current	I_S	7.2	A
Diode pulse current	$I_{S,pulse}$	21.6	A

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

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static characteristics						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA	650	-	-	V
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	2.5	3.13	4.5	V
Drain cut-off current	I _{DSS}	V _{DS} =650V, V _{GS} =0 V, T _J =25°C	-	-	1	μA
Gate leakage current, Forward	I _{GSSF}	V _{GS} =30V, V _{DS} =0 V	-	-	100	nA
Gate leakage current, Reverse	I _{GSSR}	V _{GS} =-30V, V _{DS} =0 V	-	-	-100	nA
Drain-source on-state resistance	R _{DS(on)}	V _{GS} =10V, I _D =3.5A	-			Ω
		T _j = 25°C	-	0.57	0.65	
		T _j = 150°C	-	1.378	-	
Gate resistance	R _G	f=1 MHz, open drain	-	6.03	-	Ω
Dynamic characteristics						
Input capacitance	C _{iss}	V _{DS} =100V, V _{GS} =0V, f=250kHz	-	565	-	pF
Output capacitance	C _{oss}		-	21.55	-	
Reverse transfer capacitance	C _{rss}		-	0.77	-	
Turn-on delay time	t _{d(on)}	V _{DD} =400V, I _D =3.5A R _G = 10Ω, V _{GS} =10V	-	36.8	-	ns
Rise time	t _r		-	9.8	-	
Turn-off delay time	t _{d(off)}		-	27.9	-	
Fall time	t _f		-	15.6	-	
Gate charge characteristics						
Gate to source charge	Q _{gs}	V _{DD} =520V, I _D =3.5A, V _{GS} =0 to 10 V	-	2.9	-	nC
Gate to drain charge	Q _{gd}		-	6.3	-	
Gate charge total	Q _g		-	14	-	
Gate plateau voltage	V _{plateau}		-	5	-	V
Reverse diode characteristics						
Diode forward voltage	V _{SD}	V _{GS} =0 V, I _F =3.5A	-	-	1.1	V
Reverse recovery time	t _{rr}	V _R =400V, I _F =3.5A, dI _F /dt=100 A/μs	-	198.1	-	ns
Reverse recovery charge	Q _{rr}		-	1123.7	-	nC
Peak reverse recovery current	I _{rrm}		-	12.74	-	A

Notes:

- Limited by maximum junction temperature and duty cycle.
- Limited by maximum junction temperature, maximum duty cycle is 0.75.
- $I_{AS}=2A, L=60\text{ mH}, V_{DD}=60V$, Starting $T_J=25^{\circ}\text{C}$.
- The value of R_{thJA} is measured by placing the device in a still air box which is one cubic foot.

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.56	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction-to-Ambient, minimal Footprint ⁴⁾	$R_{\theta JA}$	62	$^{\circ}\text{C}/\text{W}$
Soldering temperature, wave soldering only allowed at leads. (1.6mm from case for 10s)	T_{sold}	260	$^{\circ}\text{C}$

RATING AND CHARACTERISTIC CURVES

Figure 1. Typ. Output Characteristics

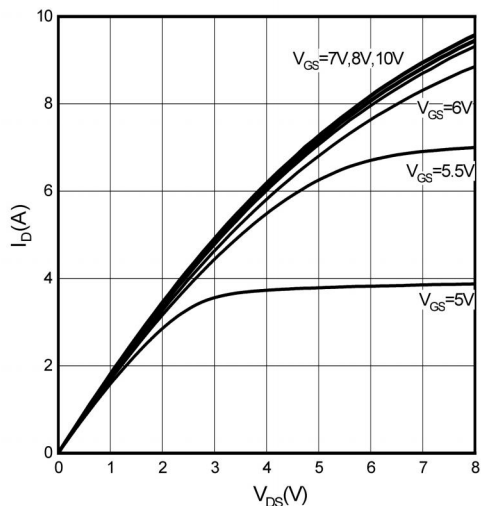


Figure 2. Transfer Characteristics

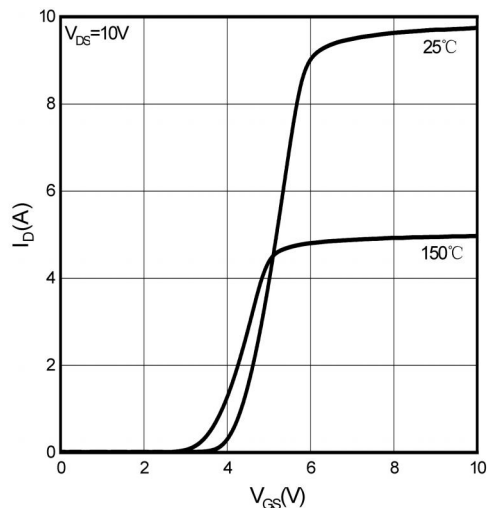


Figure 3. On-Resistance vs. Drain Current

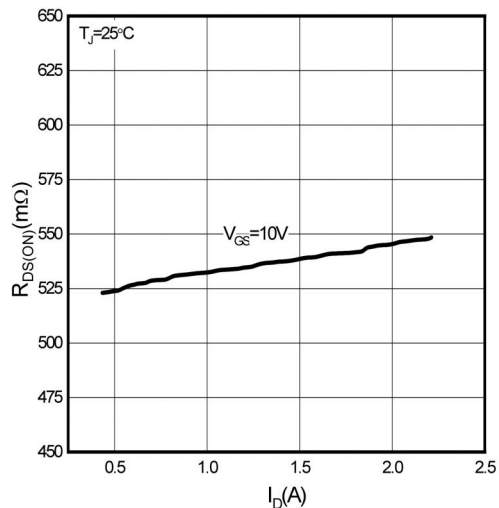


Figure 4. On-Resistance vs. Temperature

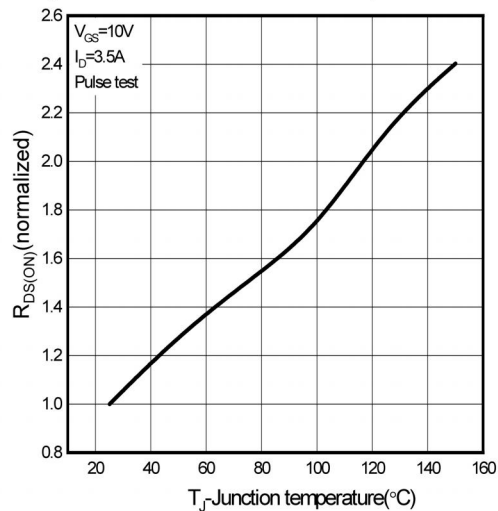


Figure 5. Breakdown Voltage vs. Temperature

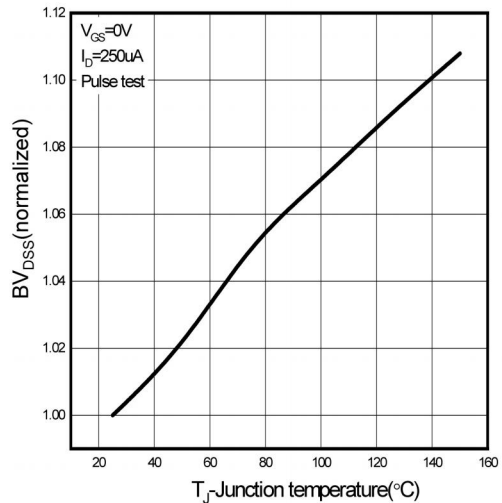
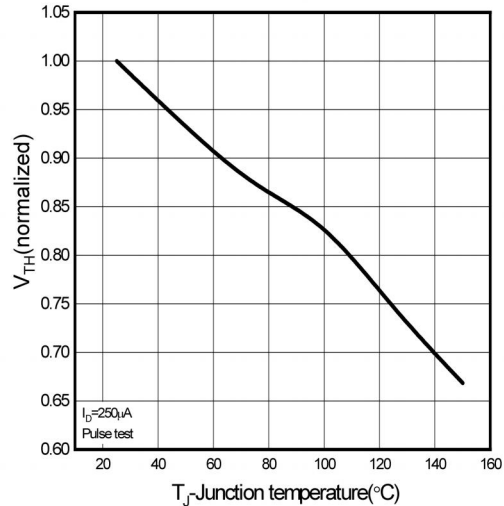


Figure 6. Threshold Voltage vs. Temperature



RATING AND CHARACTERISTIC CURVES

Figure 7. Body-Diode Characteristics

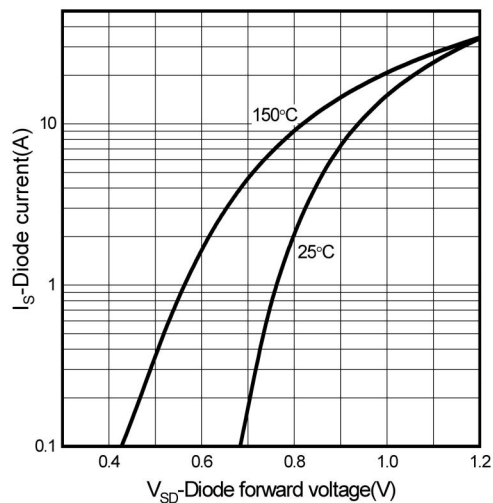


Figure 8. Capacitance Characteristics

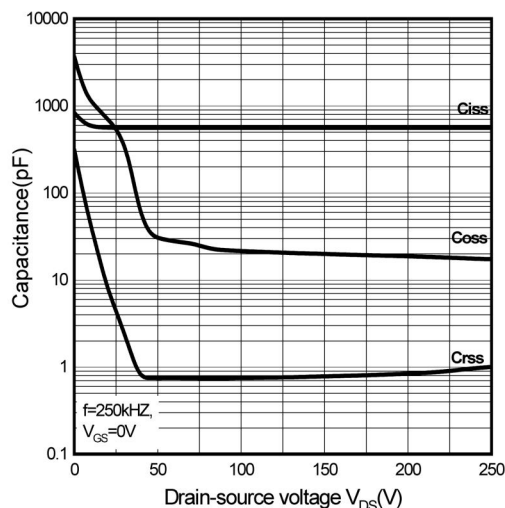


Figure 9. Gate Charge Characteristics

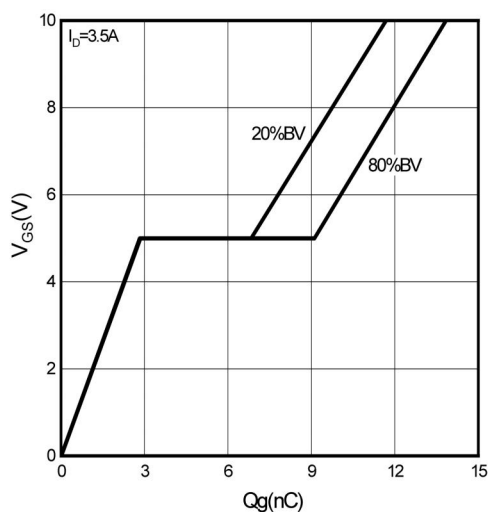


Figure 10. Drain Current Derating

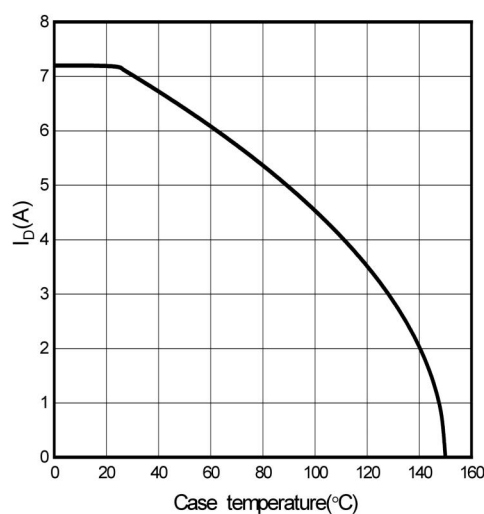
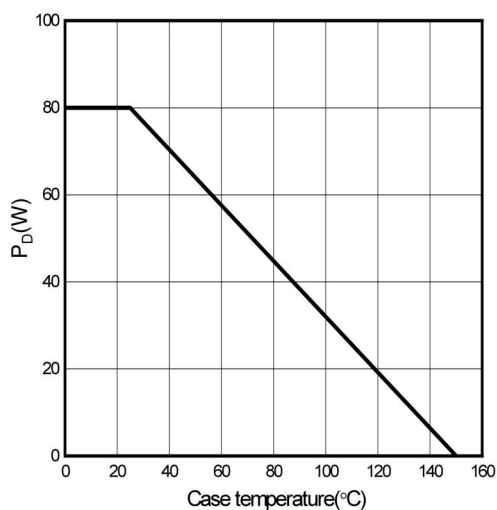
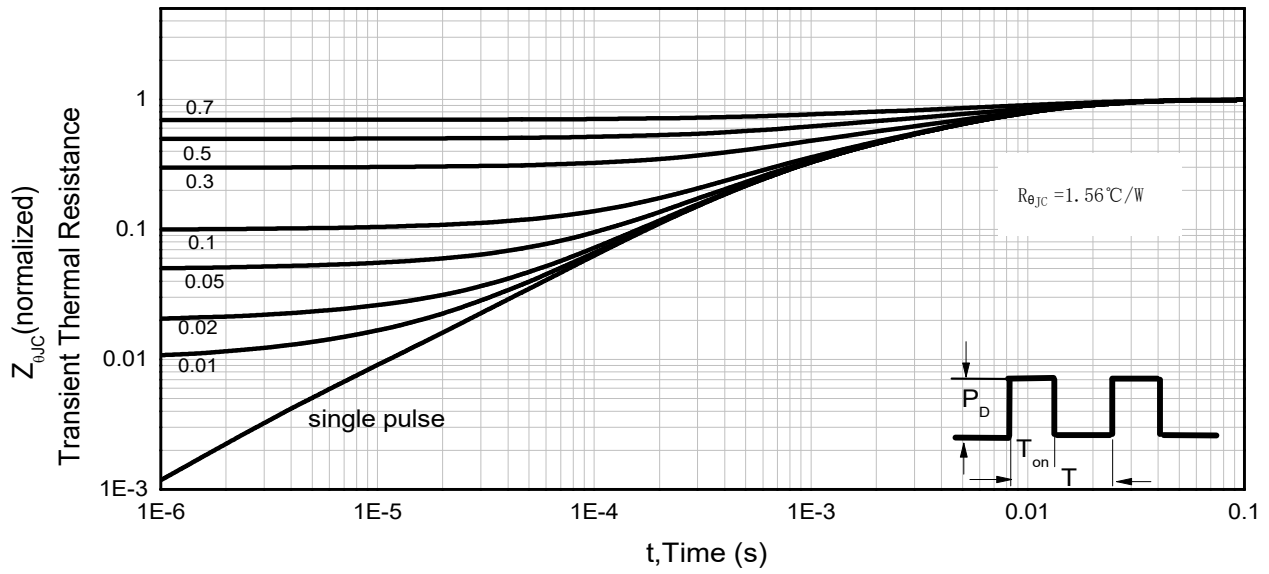


Figure 11. Power Dissipation vs. Temperature



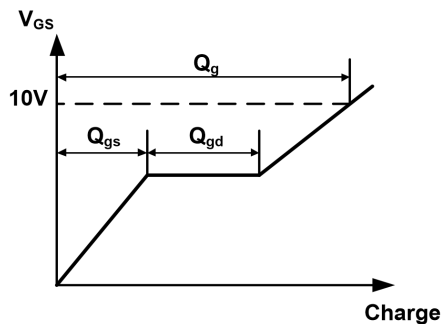
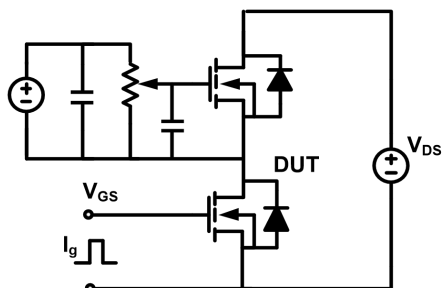
RATING AND CHARACTERISTIC CURVES

Figure 13. Normalized Maximum Transient Thermal Impedance (R_{thJC})

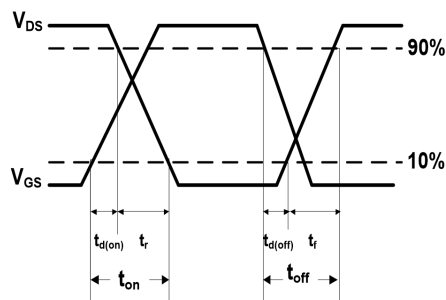
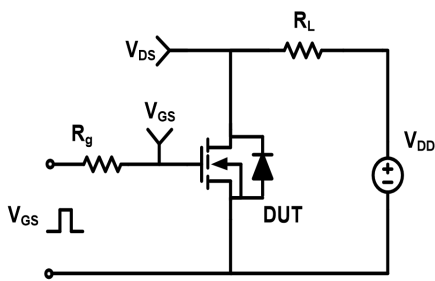


Test Circuit

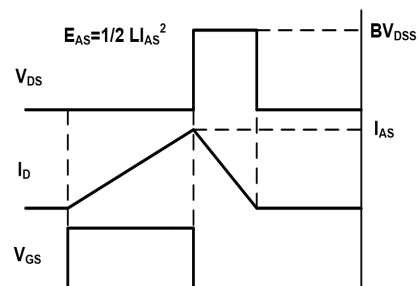
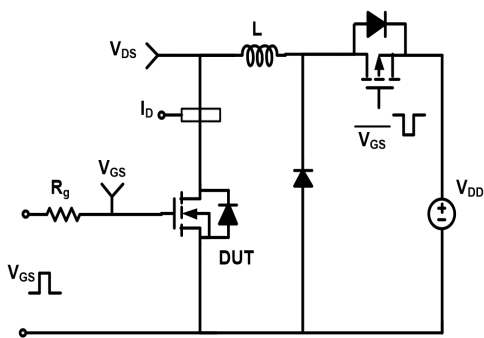
Gate Charge Test Circuit & Waveform



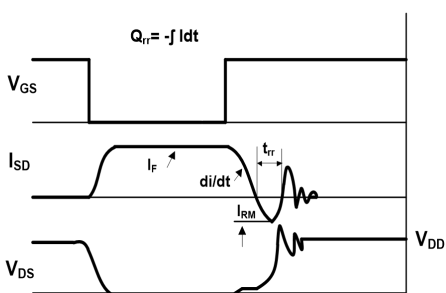
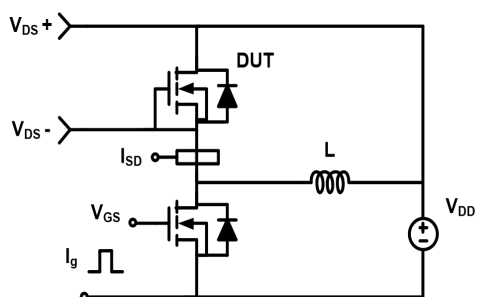
Resistive Switching Test Circuit & Waveform



Unclamped Inductive Switching (UIS) Test Circuit & Waveform

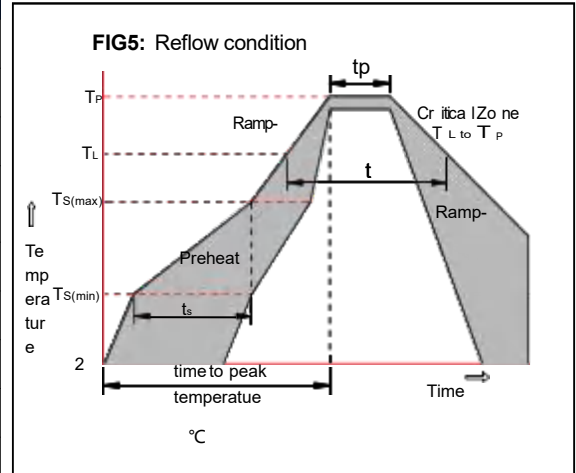


Diode Recovery Test Circuit & Waveform



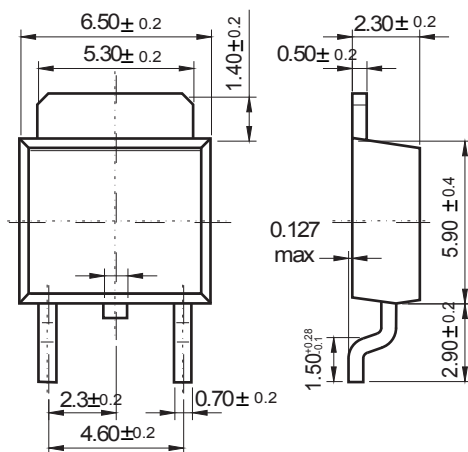
Soldering parameters

Reflow Condition		Pb-Free assembly (see as below)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150 °C
	-Temperature Max($T_{s(max)}$)	+200 °C
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3 °C/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3 °C/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217 °C
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_P)		+260(+0/-5) °C
Time within 5 °C of actual Peak Temp (t_P)		30 secs. Max
Ramp-down Rate		6 °C/sec. Max
Time 25 °C to Peak Temp (T_P)		8 min. Max
Do not exceed		+260 °C

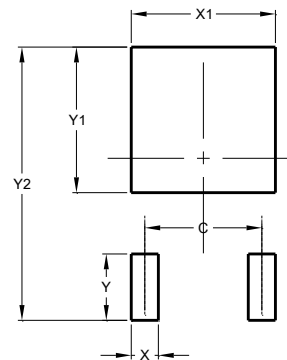


Package Dimensions & Suggested Pad Layout

TO-252



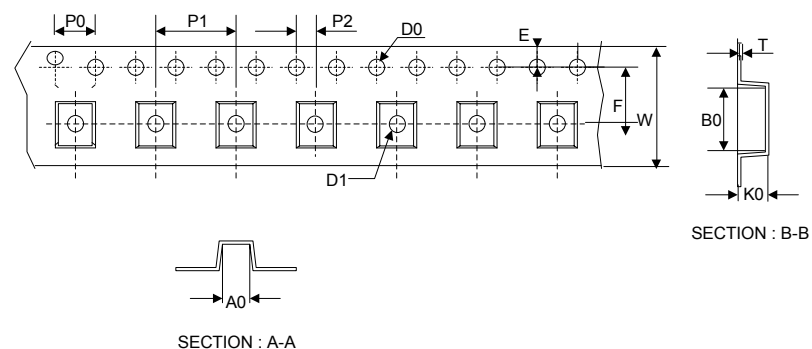
Dimensions in inches and (millimeters)



Dimensions	Value (in mm)
C	4.55
X	1.50
X1	5.80
Y	2.70
Y1	6.00
Y2	10.90

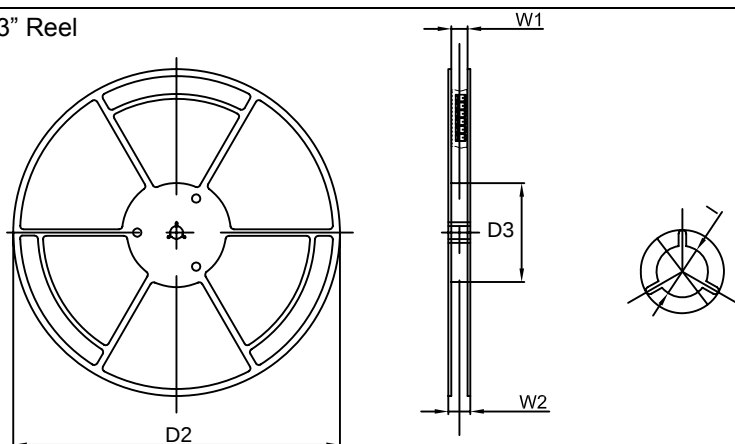
Tape & reel specification

Tape



Symbol	Dimension (mm)
P0	4.00±0.20
P1	8.00±0.20
P2	2.00±0.20
D0	1.55±0.15
D1	1.55±0.20
E	1.75±0.20
F	7.50±0.20
W	16.00±0.20
A0	7.10±0.20
B0	10.50±0.20
K0	2.70±0.20
T	0.30±0.10
D2	330.0±5.0
D3	100.0±4.0
W1	20.0±5.0
W2	25.0±5.0
I	13.0±2.0

13" Reel



Quantity: 2500PCS