Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
100V	1.85mΩ@10V	200A

合肥矽普半导体
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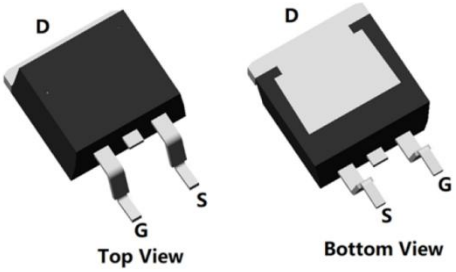
Feature

- Fast Switching
- Low Gate Charge and Rdson
- Advanced Split Gate Trench Technology
- 100% Single Pulse avalanche energy Test

Applications

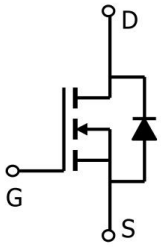
- PWM Application
- Hard switched and high frequency circuits
- Power Management

Package

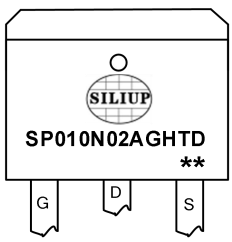


TO-263(1:G 2:D 3:S)

Circuit diagram



Marking



SP010N02AGHTD :Device Code
** :Week Code

Order Information

Device	Package	Unit/Tape
SP010N02AGHTD	TO-263	800

Absolute maximum ratings (Ta=25℃,unless otherwise noted)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current (Tc=25℃)	Package Limit	I_D	200	A
Continuous Drain Current (Tc=25℃)	Silicon Limit	I_D	240	A
Continuous Drain Current (Tc=100℃)		I_D	133	A
Pulsed Drain Current		I_{DM}	800	A
Single Pulse Avalanche Energy[1]		E_{AS}	2025	mJ
Power Dissipation (Tc=25℃)		P_D	275	W
Power Dissipation (Tc=100℃)		P_D	110	W
Thermal Resistance Junction-to-Case		$R_{\theta JC}$	0.45	℃/W
Storage Temperature Range		T_{STG}	-55 to 150	℃
Operating Junction Temperature Range		T_J	-55 to 150	℃

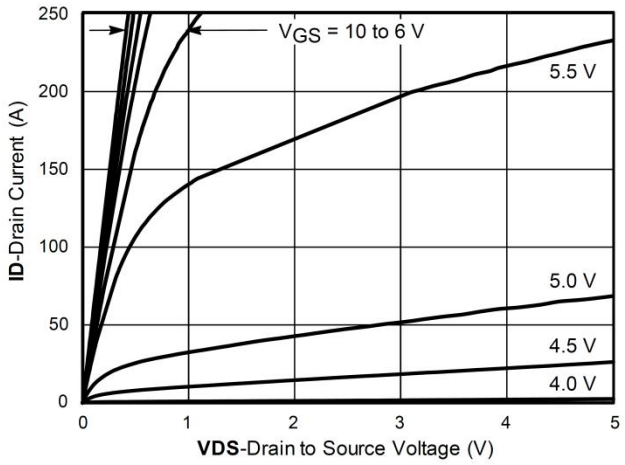
Electrical characteristics (Ta=25℃, unless otherwise noted)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	VGS=0V , ID=250uA	100	-	-	V
Drain Cut-Off Current	I_{DSS}	VDS=80V , VGS=0V , TJ=25℃	-	-	1	μA
Gate Leakage Current	I_{GSS}	VGS=±20V , VDS=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	VGS=VDS , ID =250uA	2.6	3.0	3.4	V
Drain-Source ON Resistance	$R_{DS(ON)}$	VGS=10V , ID=20A	-	1.85	2.3	mΩ
Gate Resistance	R_G	VDS=50V , VGS=0V , f=1MHz	-	3.4	-	Ω
Dynamic Characteristics						
Input Capacitance	C_{iss}	VDS=50V , VGS=0V , f=1MHz	-	9499	-	pF
Output Capacitance	C_{oss}		-	1602	-	
Reverse Transfer Capacitance	C_{rss}		-	38	-	
Total Gate Charge	Q_g	VDS=50V , VGS=10V , ID=100A	-	152	-	nC
Gate-Source Charge	Q_{gs}		-	42	-	
Gate-Drain Charge	Q_{gd}		-	32	-	
Gate Pleteau Vlotage	$V_{pleteau}$		-	5	-	V
Switching Characteristics						
Turn-On Delay Time	$t_{d(on)}$	VDD=50V , VGS=10V , RG=4Ω , ID=100A	-	20	-	nS
Rise Time	t_r		-	60	-	
Turn-Off Delay Time	$t_{d(off)}$		-	70	-	
Fall Time	t_f		-	23	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V_{SD}	IS=1A , VGS=0V	-	-	1.2	V
Maximum Body-Diode Continuous Current	I_S		-	-	200	A
Reverse Recovery Time	T_{rr}	IS=50A , di/dt=100A/us , TJ=25℃	-	96	-	nS
Reverse Recovery Charge	Q_{rr}		-	196	-	nC

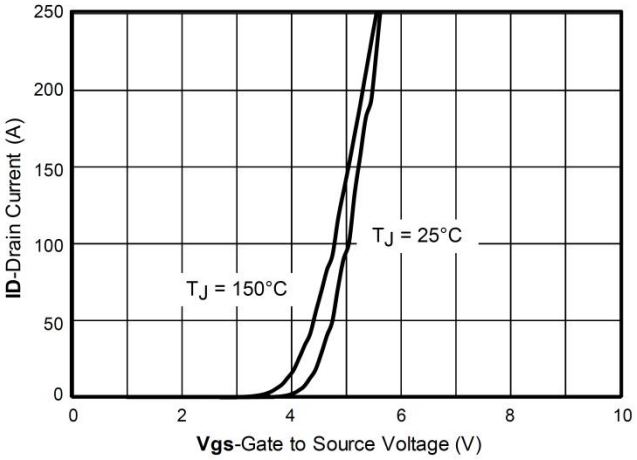
Note :

1. The test condition is VDD=50V,VGS=10V,L=0.5mH,RG=25Ω

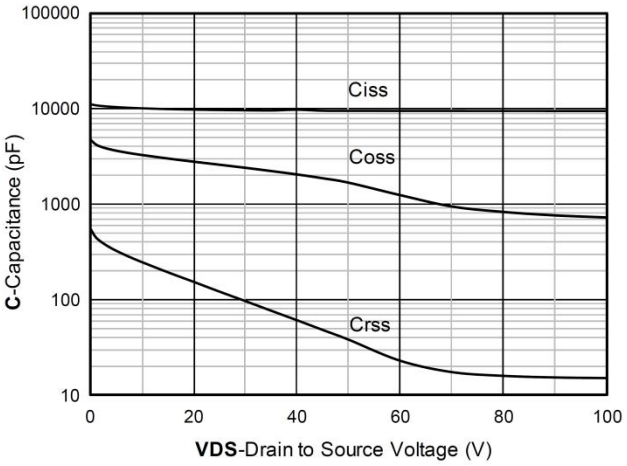
Typical Characteristics



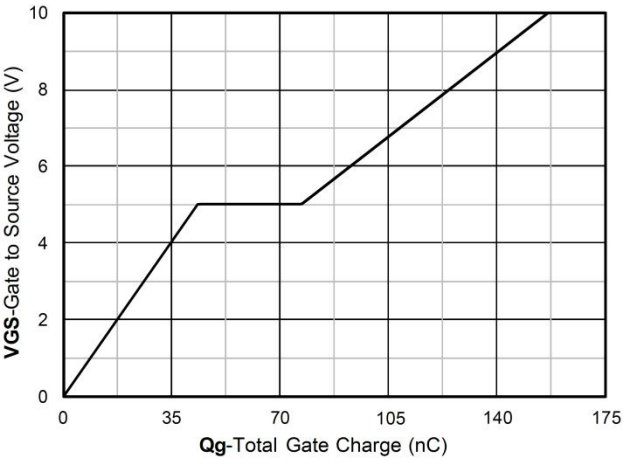
Output Characteristics



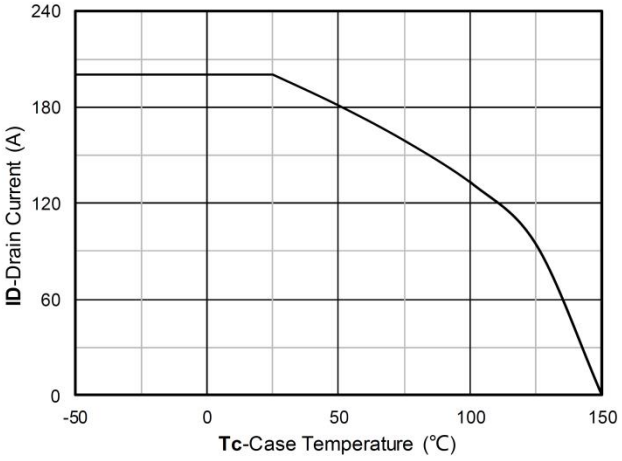
Transfer Characteristics



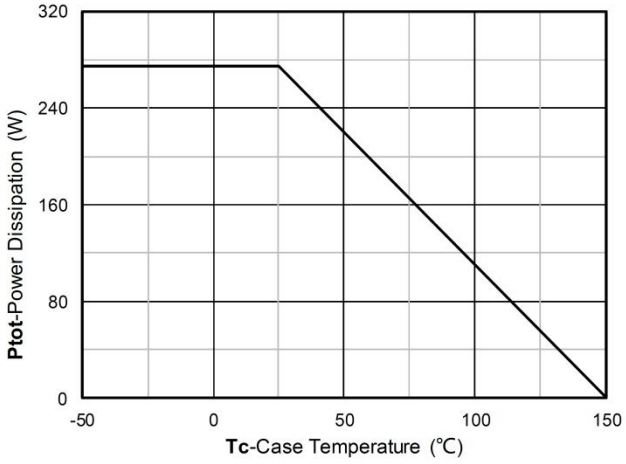
Capacitance Characteristics



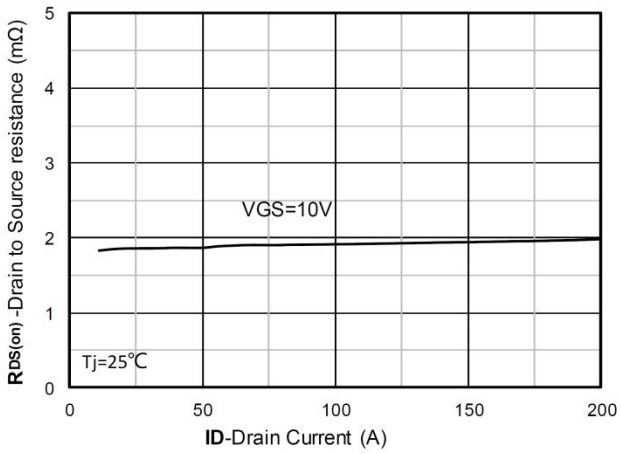
Gate Charge



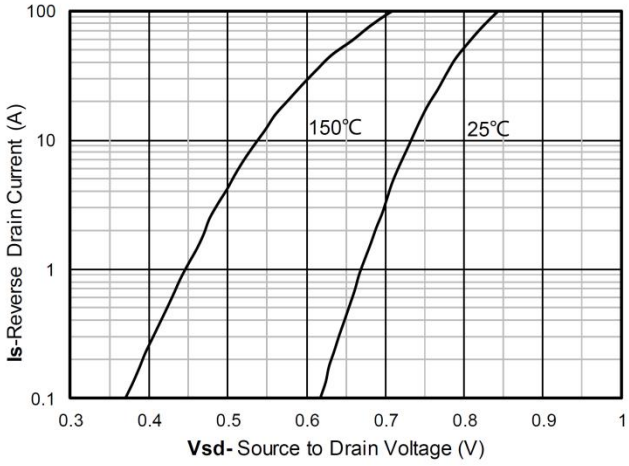
Current dissipation



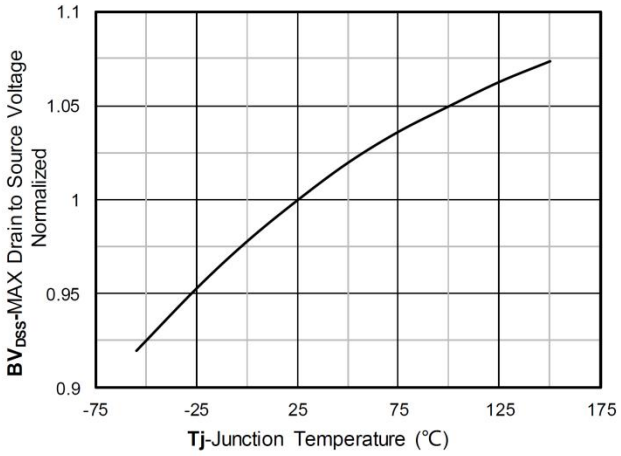
Power dissipation



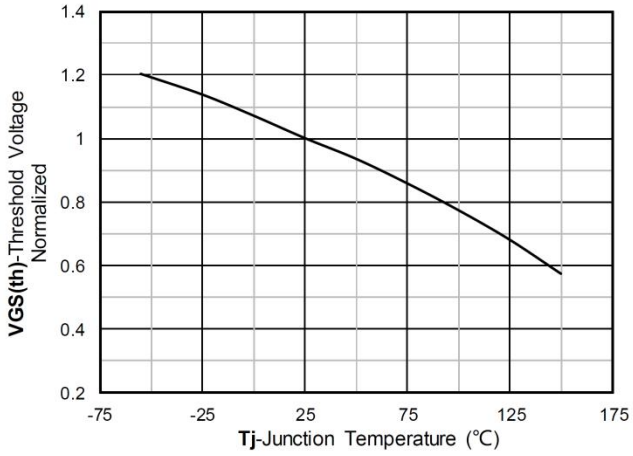
RDS(on) VS Drain Current



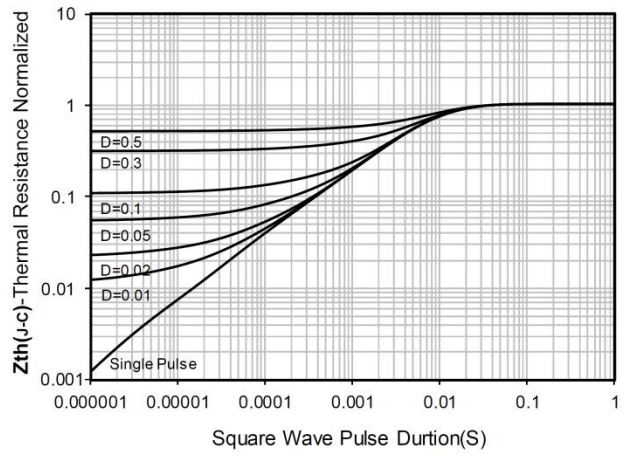
Forward characteristics of reverse diode



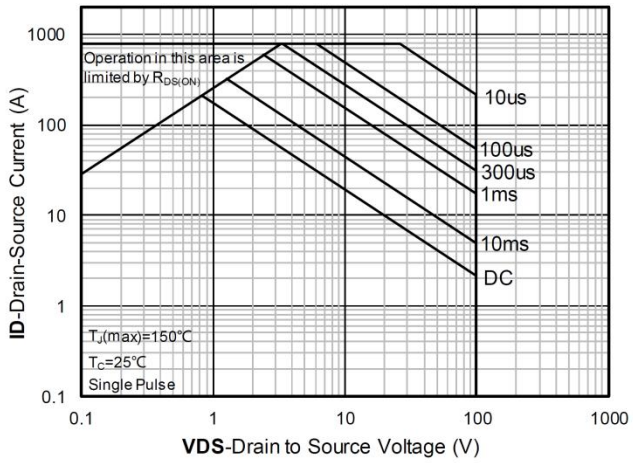
Normalized breakdown voltage



Normalized Threshold voltage



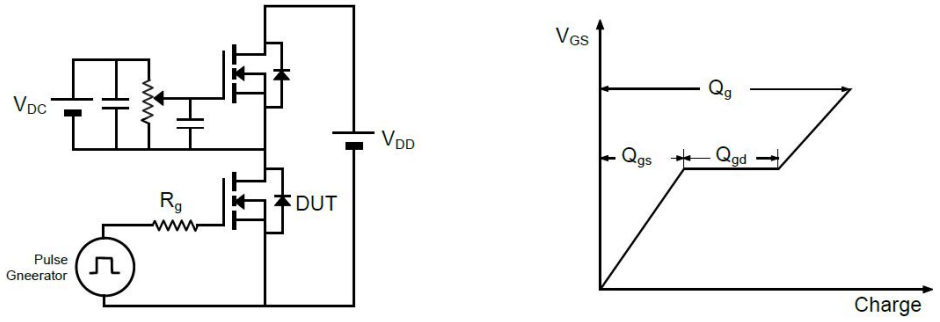
Maximum Transient Thermal Impedance



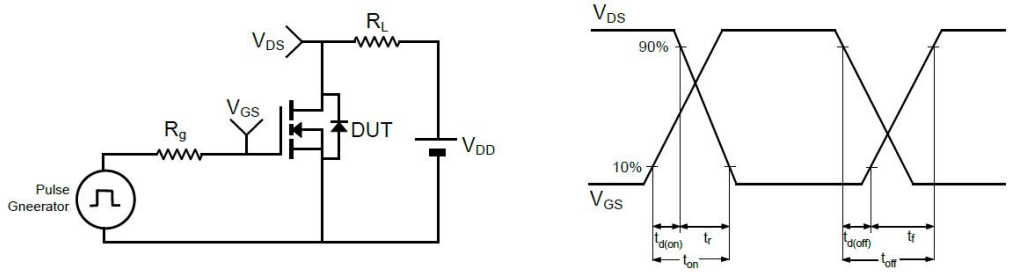
Safe Operation Area

Test Circuit

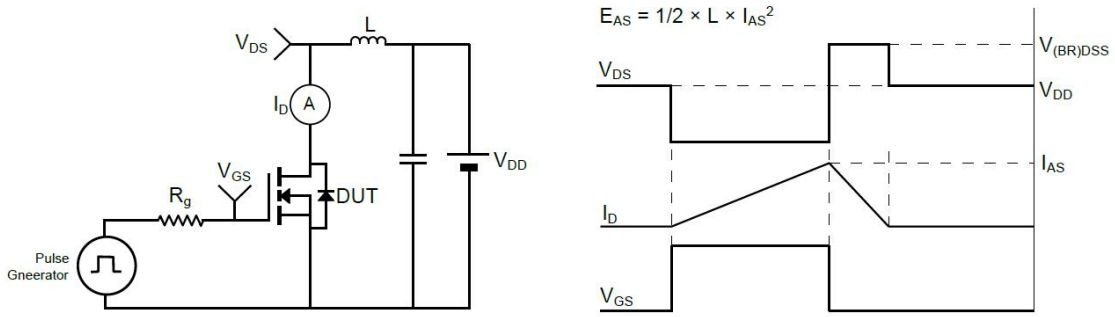
Gate Charge



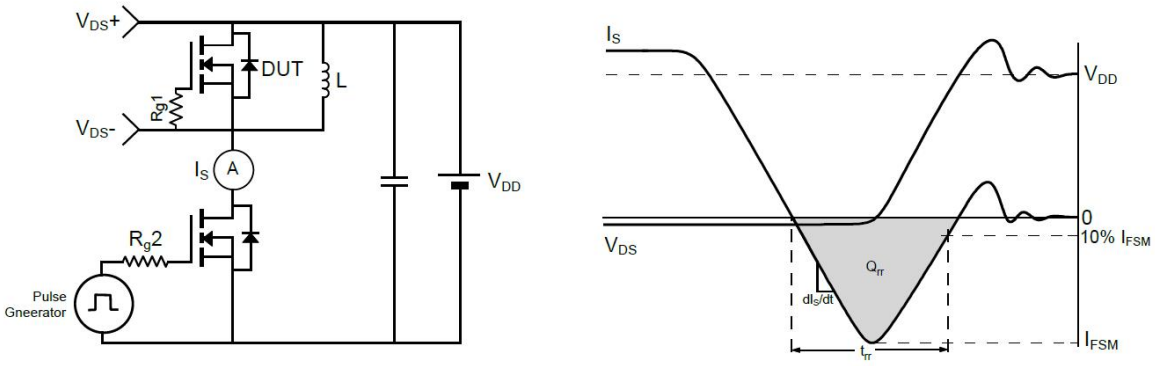
Resistive Load Switching Time



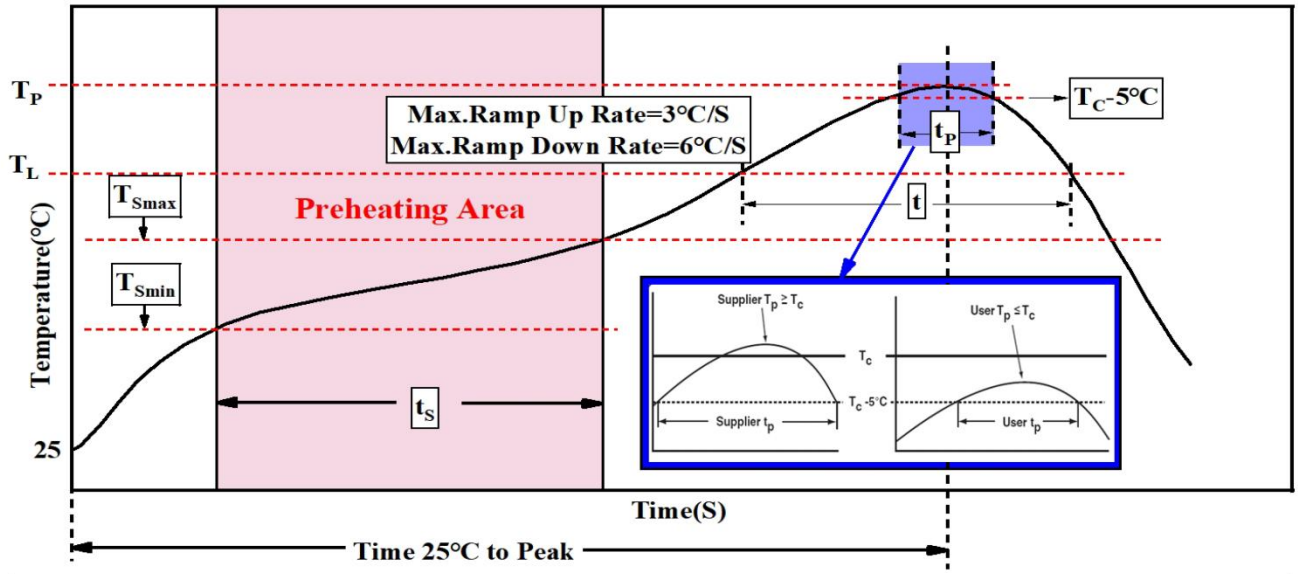
Un-clamped Inductive Load Switching



Drain-Source Body Diode Reverse Recovery



Temperature Profile for IR Reflow Soldering



Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat & Soak Temperature min (Tsmin) Temperature max (Tsmax) Time (Tsmin to Tsmax) (ts)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-120 seconds
Average ramp-up rate (Tsmax to Tp)	3 °C/second max.	3°C/second max.
Liquidous temperature (TL) Time at liquidous (tL)	183 °C 60-150 seconds	217°C 60-150 seconds
Peak package body Temperature e (Tp)*	See Classification Temp in table 1	See Classification Temp in table 2
Time (tp)** within 5°C of the specified classification temperature (Tc)	20** seconds	30** seconds
Average ramp-down rate (Tp to Tsmax)	6 °C/second max.	6 °C/second max.
Time 25°C to peak temperature	6 minutes max.	8 minutes max.
* Tolerance for peak profile Temperature (Tp) is defined as a supplier minimum and a user maximum. ** Tolerance for time at peak profile temperature (tp) is defined as a supplier minimum and a user maximum		

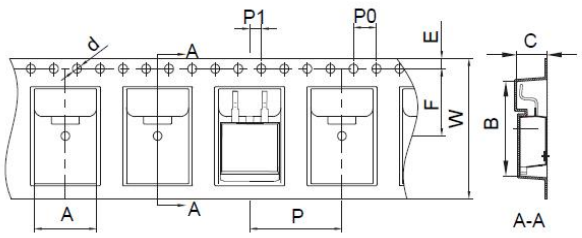
Table 1. SnPb Eutectic Process – Classification Temperatures (Tc)

Package Thickness	Volume mm^3 <350	Volume mm^3 ≥350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2. Pb-free Process – Classification Temperatures (Tc)

Package Thickness	Volume mm^3 <350	Volume mm^3 350-2000	Volume mm^3 >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 mm – 2.5 mm	260 °C	250 °C	245 °C
≥2.5 mm	250 °C	245 °C	245 °C

TO-263 Reel Information

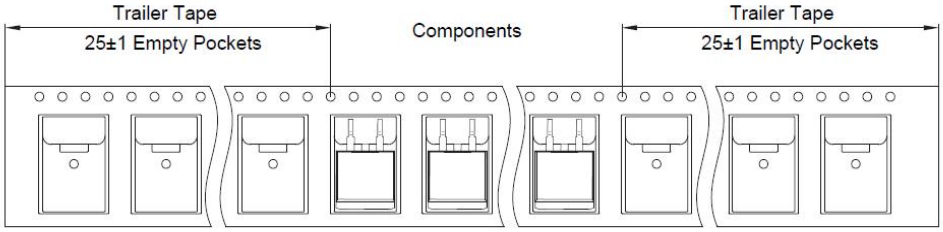


Packaging Description:

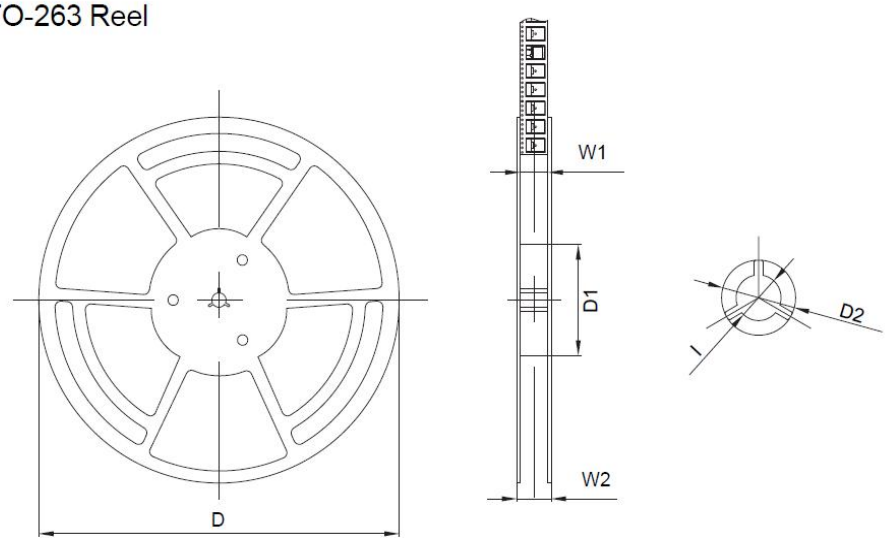
TO-263 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Hear Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 800 units per 13″ or 33.0 cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
TO-263	10.80	16.13	5.21	Φ1.55	1.75	11.50	4.00	16.00	2.00	24.00

TO-263 Tape Leader and Trailer



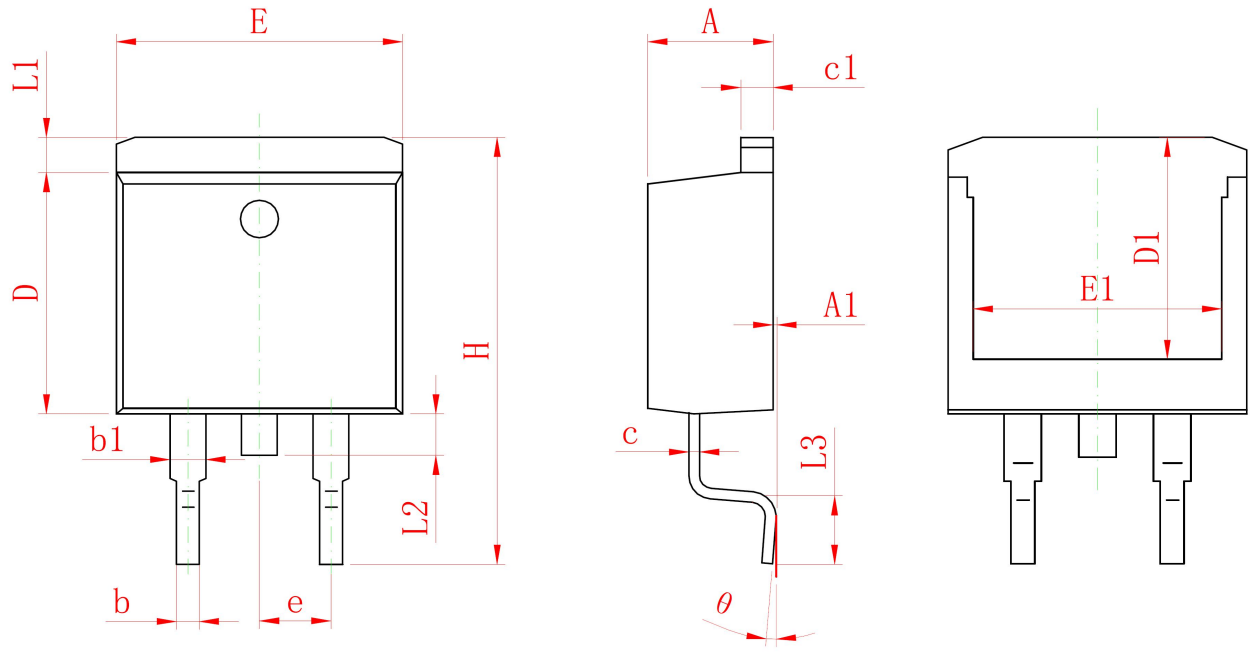
TO-263 Reel



Dimensions are in millimeter						
Reel	D	D1	D2	W1	W2	I
13" Dia	330.00	100.00	Φ21.00	24.40	30.40	Φ13.00

Reel	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)
800 pcs	13 inch	1600 pcs	360×360×65	8000 pcs	378×358×382

TO-263 Package Information



Symbol	Dimensions In Millimeters	
	Min.	Max.
A	4.40	4.67
A1	0.02	0.23
b	0.70	0.90
b1	1.21	1.40
c	0.40	0.60
c1	1.25	1.45
D	9.00	9.30
D1	8.10 REF	
E	9.70	10.20
E1	7.00	8.20
e	2.54 TYP.	
H	14.80	15.40
L1	1.10	1.40
L2	1.10	1.70
L3	2.10	2.50
θ	0°	9°