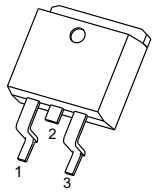
TO-263-2L Plastic-Encapsulate MOSFETS

B120SN10

N-Channel Power MOSFET

$V_{(BR)DSS}$	$R_{DS(on)}$TYP	I_D
100V	5.0mΩ@10V	120A

TO-263-2L



1. GATE
2. DRAIN
3. SOURCE

DESCRIPTION

The B120S10 uses shielded gate trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications

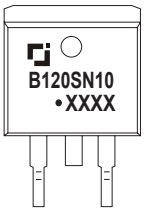
FEATURES

- Low $R_{DS(on)}$
- Low Gate Charge

APPLICATIONS

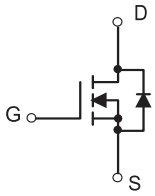
- High efficiency power supply
- Secondary synchronus rectifier

MARKING



B120SN10 = Device code.
Solid dot = Green molding compound device, if none, the normal device.
XXXX = Code.

EQUIVALENT CIRCUIT



MAXIMUM RATINGS (T_a=25℃ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D①	120	A
Pulsed Drain Current	I_{DM}②	480	A
Single Pulsed Avalanche Energy	E_{AS}③	200	mJ
Power Dissipation	P_D①	230	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$⑥	62.5	℃/W
Thermal Resistance from Junction to Case	$R_{\theta JC}$①	0.54	℃/W
Operation Junction and Storage Temperature Range	T_J ,T_{stg}	-55 ~+150	℃

MOSFET ELECTRICAL CHARACTERISTICS

T_a=25℃ unless otherwise specified

Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
Off characteristics							
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250uA		100			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =100V, V_{GS} =0V	T_J =25℃			1	μA
			T_J =125℃			100	
Gate-body leakage current	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V				±100	nA
On characteristics ④							
Gate-threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250uA		2.0	3.0	4.0	V
Static drain-source on-sate resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 20A			5.0	5.8	mΩ
Dynamic characteristics ④⑤							
Input capacitance	C_{iss}	V_{DS} = 25V,V_{GS} = 0V, f = 1MHz			4190	8380	pF
Output capacitance	C_{oss}				1777	3500	
Reverse transfer capacitance	C_{rss}				34	69	
Gate resistance	R_g	f = 1MHz			1.8		Ω
Switching characteristics ④⑤							
Total gate charge	Q_g	V_{DS}=80V,I_D=20A V_{GS}=10V,R_G=3.3Ω			68	140	nC
Gate-source charge	Q_{gs}				15	30	
Gate-drain charge	Q_{gd}				20	42	
Turn-on delay time	$t_{d(on)}$	V_{DS}=80V,I_D=20A V_{GS}=10V,R_G=3.3Ω			13		ns
Turn-on rise time	t_r				60		
Turn-off delay time	$t_{d(off)}$				40		
Turn-off fall time	t_f				64		
Drain-Source Diode Characteristics							
Drain-source diode forward voltage(note1)	V_{SD} ④	V_{GS} = 0V, I_S = 20A				1.2	V
Continuous drain-source diode forward current	I_S ①					120	A
Pulsed drain-source diode forward current	I_{SM} ②					480	A

Notes:

1.T_C=25℃ Limited only by maximum temperature allowed.

2.P_W≤10μs, Duty cycle≤1%.

3.EAS condition: V_{DD}=50V,V_{GS}=10V, L=0.5mH, R_g=25Ω Starting T_J = 25°℃.

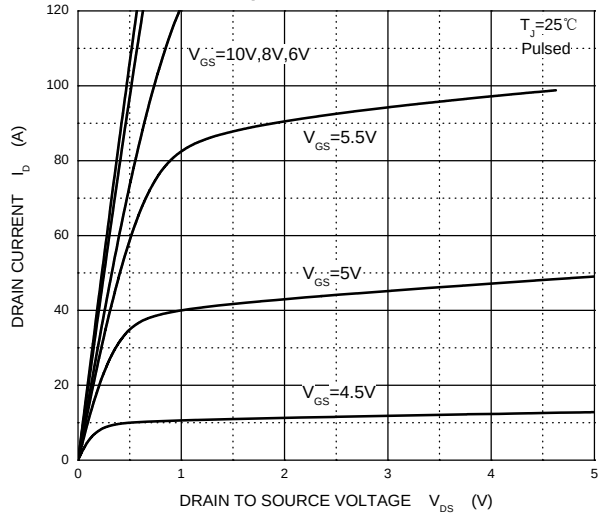
4.Pulse Test : Pulse Width≤300μs, duty cycle ≤2%.

5.Guaranteed by design, not subject to production.

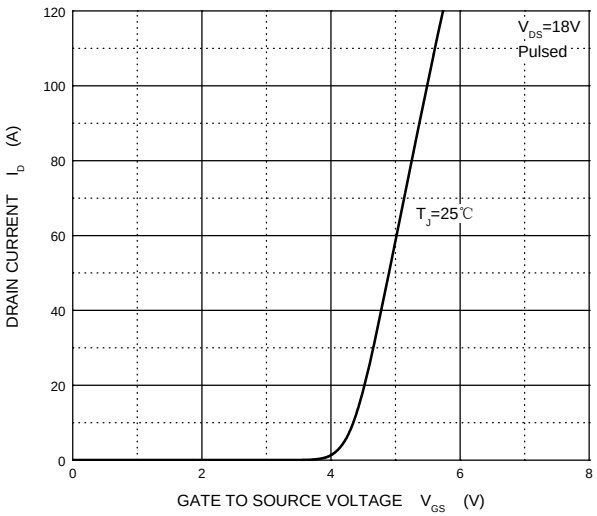
6.The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_a=25℃.

Typical Characteristics

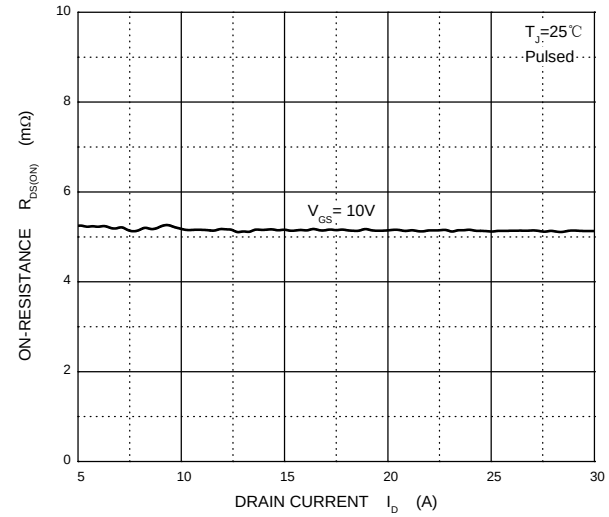
Output Characteristics



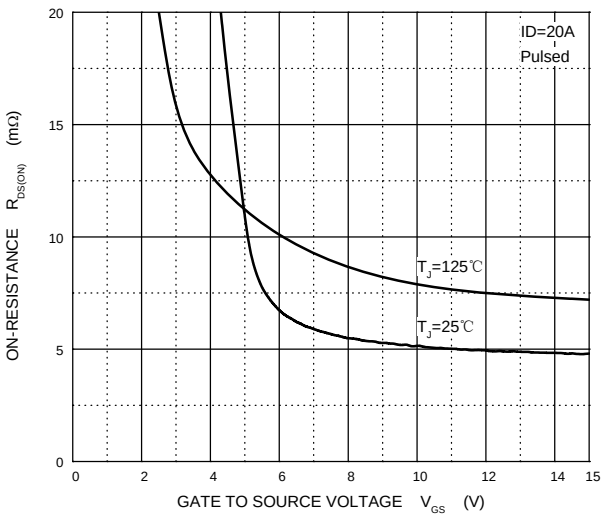
Transfer Characteristics



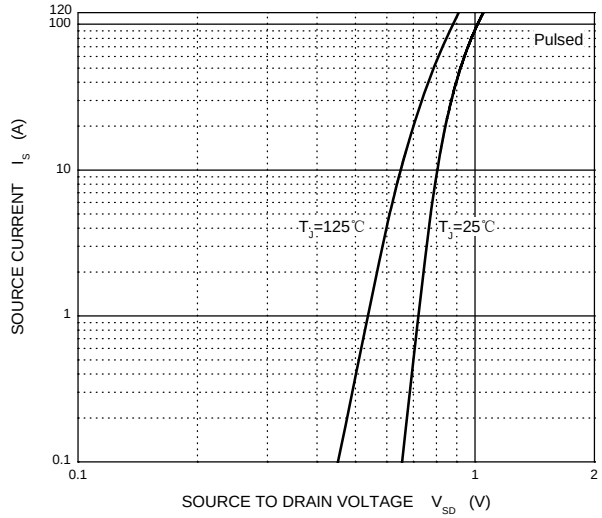
$R_{DS(ON)}$ —— I_D



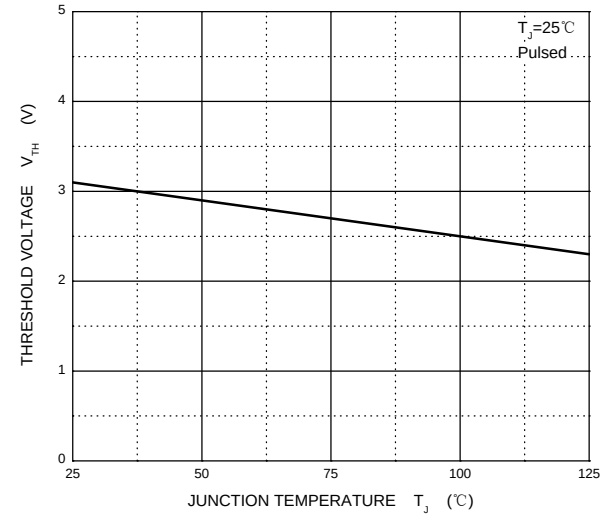
$R_{DS(ON)}$—— V_{GS}



I_S —— V_{SD}

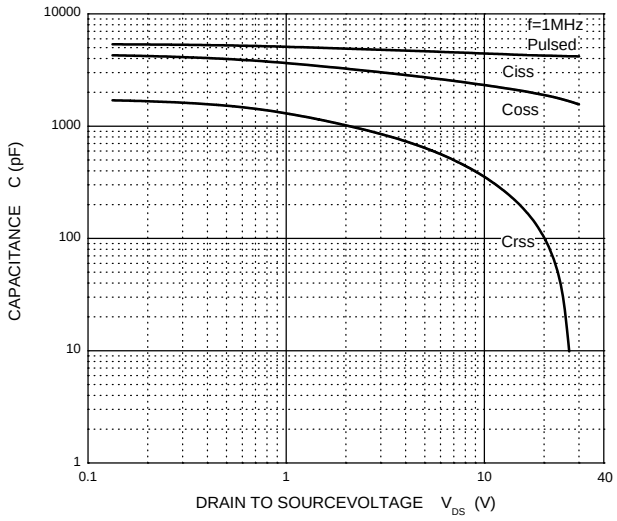


Threshold Voltage

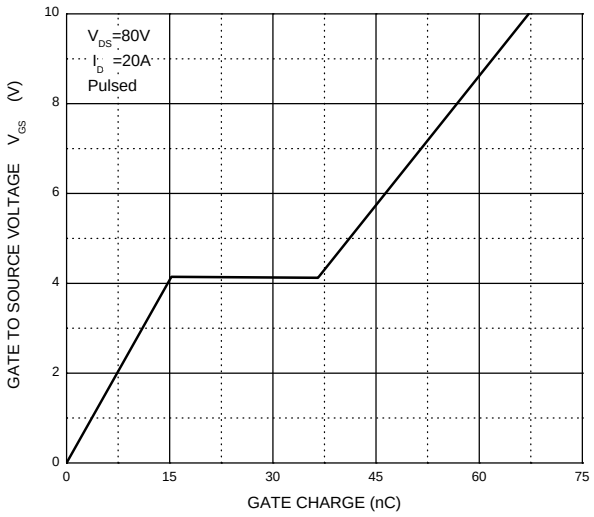


Typical Characteristics

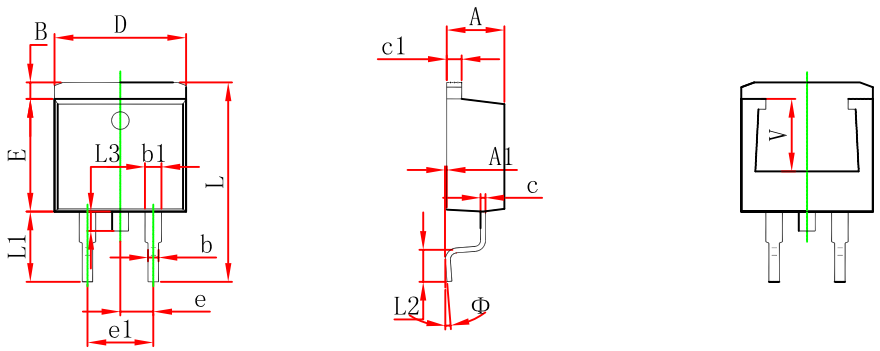
Capacitances



Gate Charge

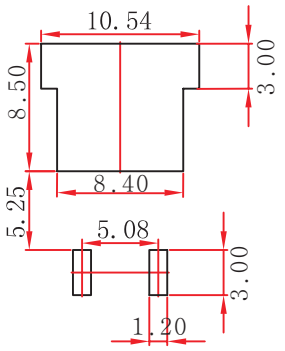


TO-263-2L Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184
A1	0.000	0.150	0.000	0.006
B	1.120	1.420	0.044	0.056
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
L	14.940	15.500	0.588	0.610
L1	4.950	5.450	0.195	0.215
L2	2.340	2.740	0.092	0.108
L3	1.300	1.700	0.051	0.067
Φ	0°	8°	0°	8°
V	5.600 REF.		0.220REF.	

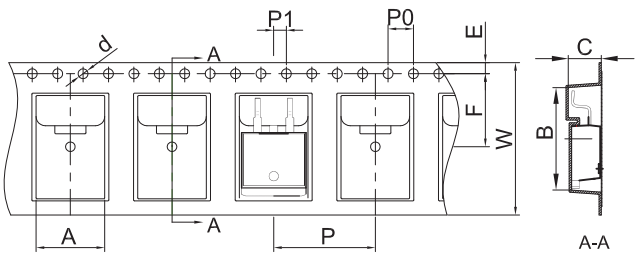
TO-263-2L Suggested Pad Layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:±0.05mm.
3.The pad layout is for reference purposes only.

TO-263-2L Tape and Reel

TO-263-2L Embossed Carrier Tape

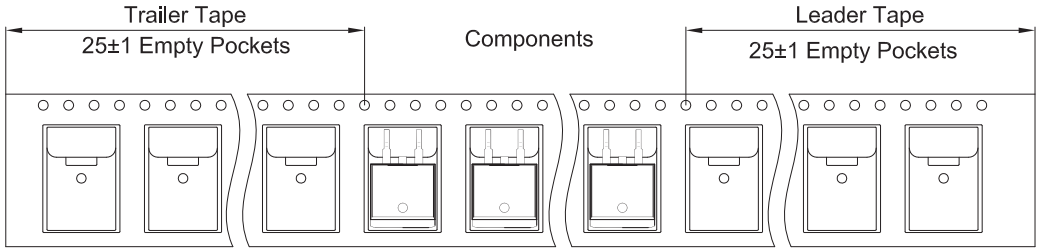


Packaging Description:

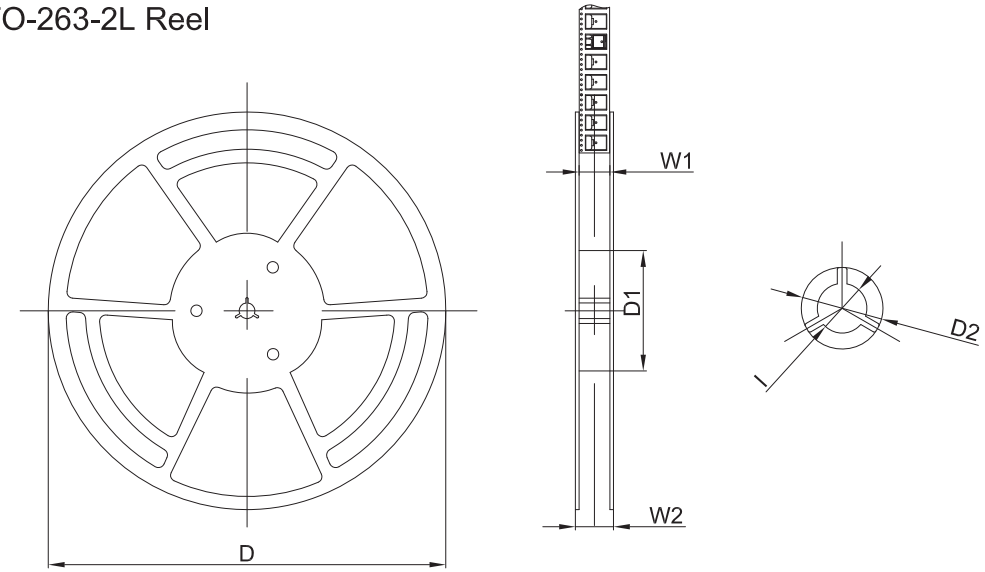
TO-263-2L parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts 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-263-2L	10.80	16.13	5.21	Ø1.55	1.75	11.50	4.00	16.00	2.00	24.00

TO-263-2L Tape Leader and Trailer



TO-263-2L Reel



Dimensions are in millimeter						
Reel Option	D	D1	D2	W1	W2	I
13"Dia	Ø330.00	100.00	Ø21.00	24.4	30.4	Ø13.00

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
800 pcs	13 inch	800 pcs	340×336×36	8,000 pcs	400×353×365	