

SOT-23-6L Plastic-Encapsulate MOSFETS

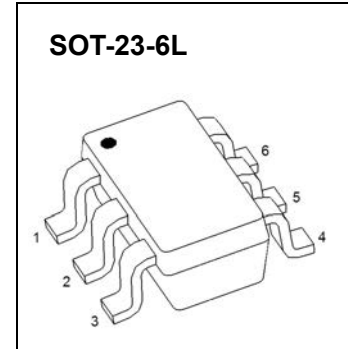
CJL2311 P-channel and N-channel Complementary MOSFETS

P-channel

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-20V	90mΩ@-4.5V	-2.3A
	125mΩ@-2.5V	
	350mΩ@-1.8V	

N-channel

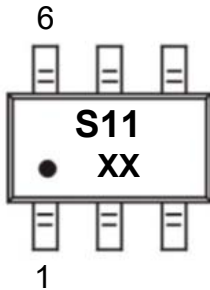
$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
20V	30mΩ@4.5V	4A
	35mΩ@2.5V	



GENERAL DESCRIPTION

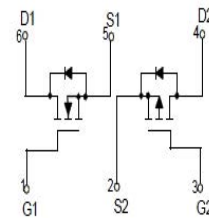
The CJL2311 uses advanced trench technology to provide excellent $R_{DS(on)}$ and low gate charge. The complementary MOSFETS form a high-speed power inverter and suitable for a multitude of applications.

MARKING



S11=Device code
Solid point=Pin1 positioning point
XX=Date Code

Equivalent Circuit



Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value		Unit
		N-channel	P-channel	
Drain-Source Voltage	V_{DS}	20	-20	V
Gate-Source Voltage	V_{GS}	± 12	± 8	V
Continuous Drain Current	I_D	4	-2.3	A
Pulsed Drain Current (note 1)	I_{DM}	12	-10	A
Power Dissipation(note 2)	P_D	1.1		W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	114		$^\circ\text{C/W}$
Operation Junction and Storage Temperature Range	T_J, T_{stg}	-55~+150		$^\circ\text{C}$

MOSFET ELECTRICAL CHARACTERISTICS

N-channel MOSFET Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	V _{(BR) DSS}	V _{GS} = 0V, I _D =250μA	20			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =20V,V _{GS} = 0V,T _J =25 C			1	μA
		V _{DS} =20V,V _{GS} = 0V,T _J =125 C			1	mA
Gate-source leakage current	I _{GSS}	V _{GS} =±12V, V _{DS} = 0V			±100	nA
On characteristics (note3)						
Drain-source on-resistance	R _{DS(on)}	V _{GS} =4.5V, I _D =3.4A		22	30	mΩ
		V _{GS} =2.5V, I _D =3A		30	35	mΩ
Forward tranconductance	g _{FS}	V _{DS} =10V, I _D =3.4A	4.5			S
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.4	0.59	1	V
Dynamic characteristics (note4)						
Input capacitance	C _{iss}	V _{GS} =0V,V _{DS} =10V,f =1MHz		480	500	pF
Output capacitance	C _{oss}			90	110	pF
Reverse transfer capacitance	C _{rss}			80	100	pF
Gate resistance	R _g	V _{DS} =0V,V _{GS} =0V,f =1MHz		21	30	Ω
Switching Characteristics (note4)						
Turn-on delay time	t _{d(on)}	V _{DD} =-10V,V _{GEN} =-4.5V,I _D =-1A R _L =10Ω,R _{GEN} =1Ω		12		ns
Turn-on rise time	t _r			80		ns
Turn-off delay time	t _{d(off)}			26		ns
Turn-off fall time	t _f			13		ns
Total Gate Charge	Q _g	V _{DS} =10V,V _{GS} =4.5V,I _D =3.4A		6.2		nC
Gate-Source Charge	Q _{gs}			0.5		nC
Gate-Drain Charge	Q _{gd}			1.7		nC
Drain-source diode characteristics and maxium ratings						
Diode forward voltage (note3)	V _{DS}	I _S =2.7A,V _{GS} =0V			1.2	V
Continuous drain-source diode forward current	I _S				4	A
Pulsed drain-source diode forward current(note 1)	I _{SM}				12	A

MOSFET ELECTRICAL CHARACTERISTICS

P-channel MOSFET Electrical Characteristics (T_A=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	V _{(BR) DSS}	V _{GS} = 0V, I _D = -250μA	-20			V
Zero gate voltage drain current	I _{DSS}	V _{DS} = -20V, V _{GS} = 0V, T _J = 25 °C			-1	μA
		V _{DS} = -20V, V _{GS} = 0V, T _J = 125 °C			-1	mA
Gate-source leakage current	I _{GSS}	V _{GS} = ±8V, V _{DS} = 0V			±100	nA
On characteristics (note3)						
Drain-source on-resistance	R _{DS(on)}	V _{GS} = -4.5V, I _D = -2.5A		75	90	mΩ
		V _{GS} = -2.5V, I _D = -2A		100	125	mΩ
		V _{GS} = -1.8V, I _D = -1.6A		250	350	mΩ
Forward tranconductance	g _{FS}	V _{DS} = -5V, I _D = -2.8A	4			S
Gate threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-0.4	-0.8	-1	V
Dynamic characteristics (note4)						
Input capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = -10V, f = 1MHz		363	400	pF
Output capacitance	C _{oss}			70	85	pF
Reverse transfer capacitance	C _{rss}			60	75	pF
Gate resistance	R _g	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz				Ω
Switching Characteristics (note4)						
Turn-on delay time	t _{d(on)}	V _{DD} = -10V, V _{GEN} = -4.5V, I _D = -1A R _L = 10Ω, R _{GEN} = 1Ω		9		ns
Turn-on rise time	t _r			33		ns
Turn-off delay time	t _{d(off)}			29		ns
Turn-off fall time	t _f			9		ns
Total Gate Charge	Q _g	V _{DS} = -10V, V _{GS} = -2.5V, I _D = -3A		5.5	10	nC
Gate-Source Charge	Q _{gs}			0.7		nC
Gate-Drain Charge	Q _{gd}			1.3		nC
Drain-source diode characteristics and maxium ratings						
Diode forward voltage (note3)	V _{DS}	I _S = -0.7A, V _{GS} = 0V			-1.2	V
Continuous drain-source diode forward current	I _S				-2.3	A
Pulsed drain-source diode forward current(note 1)	I _{SM}				-10	A

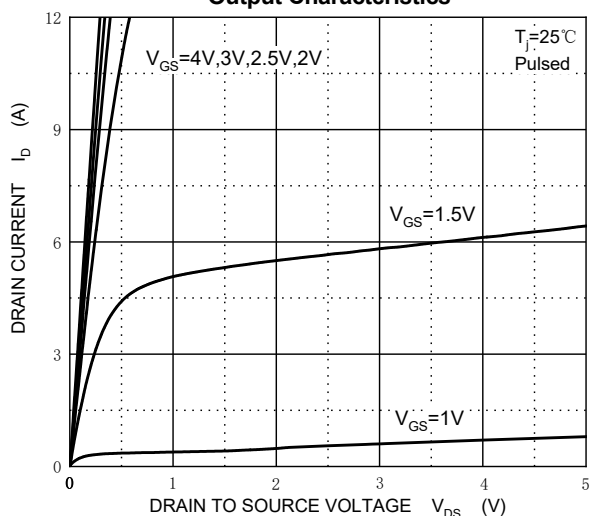
Note :

1. Repetitive Rating : Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t < 5 sec.
3. Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.

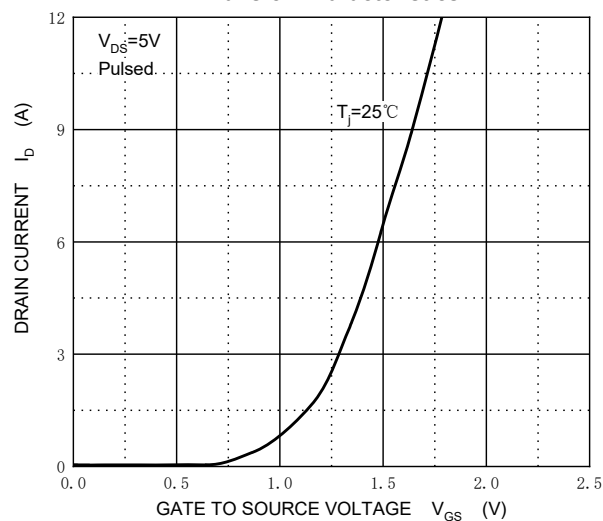
Typical Characteristics

N-Channel-MOS

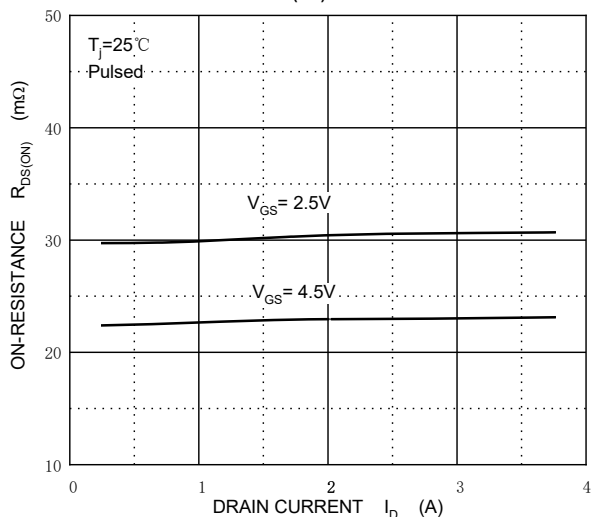
Output Characteristics



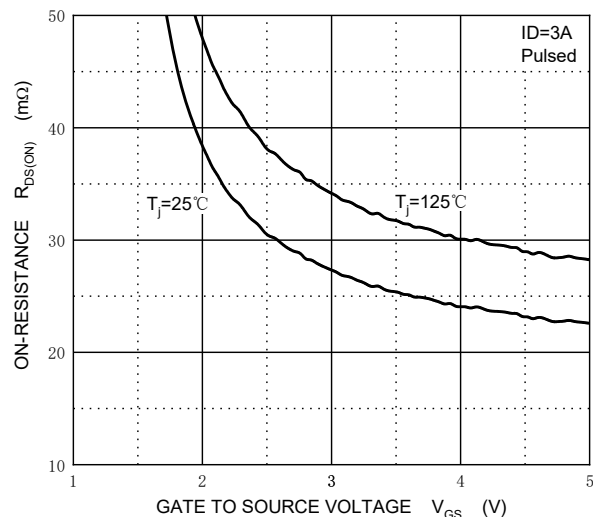
Transfer Characteristics



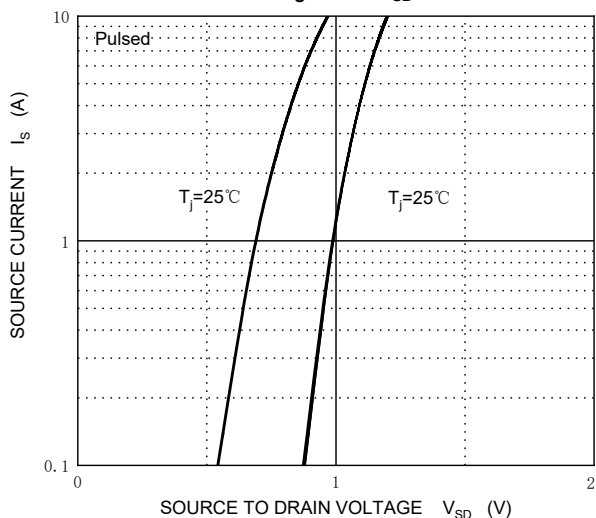
$R_{DS(ON)}$ — I_D



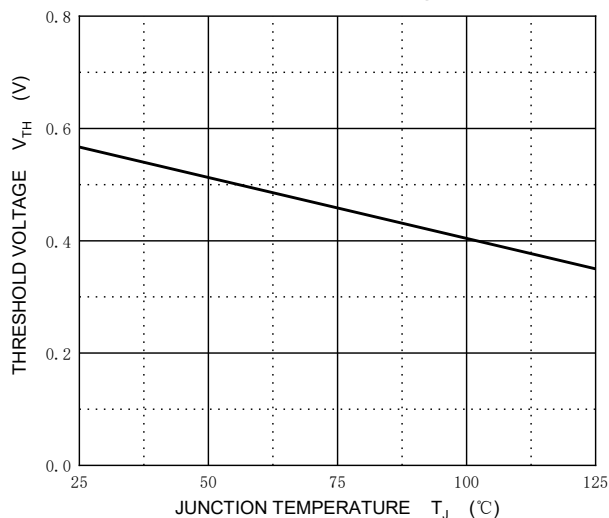
$R_{DS(ON)}$ — V_{GS}



I_S — V_{SD}



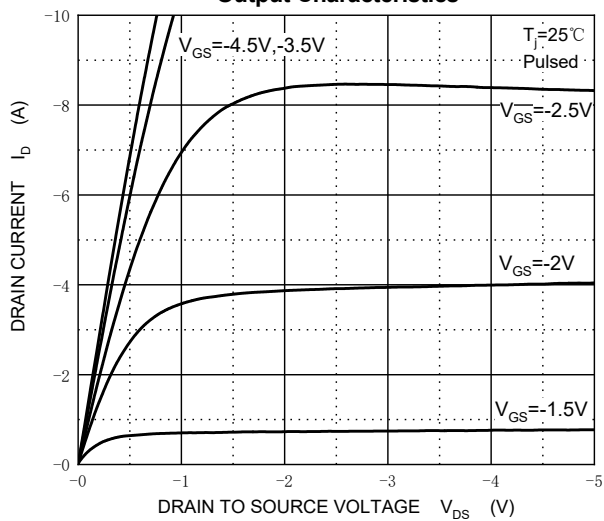
Threshold Voltage



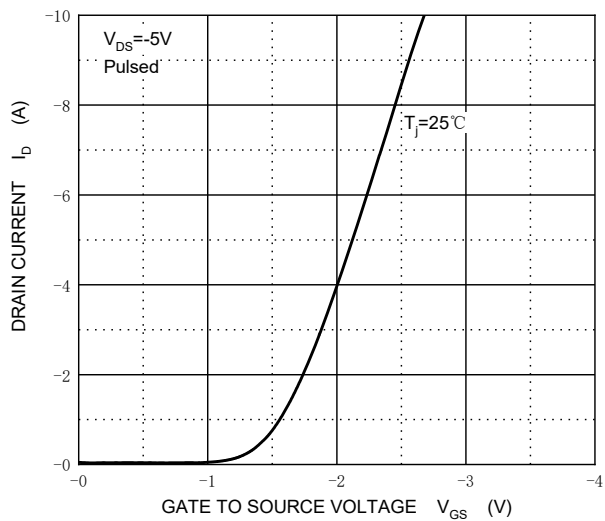
Typical Characteristics

P-Channel-MOS

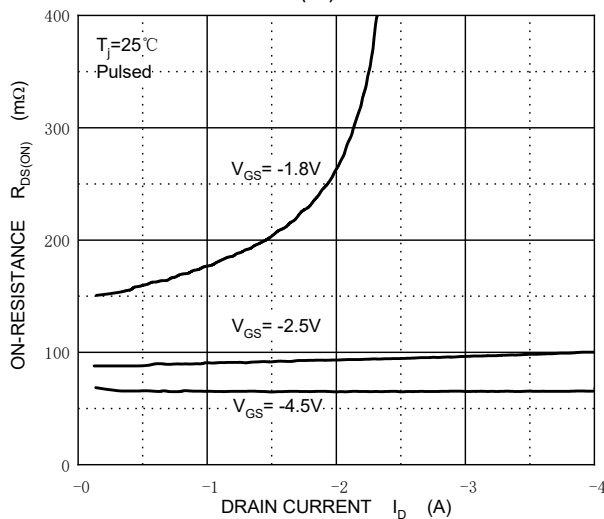
Output Characteristics



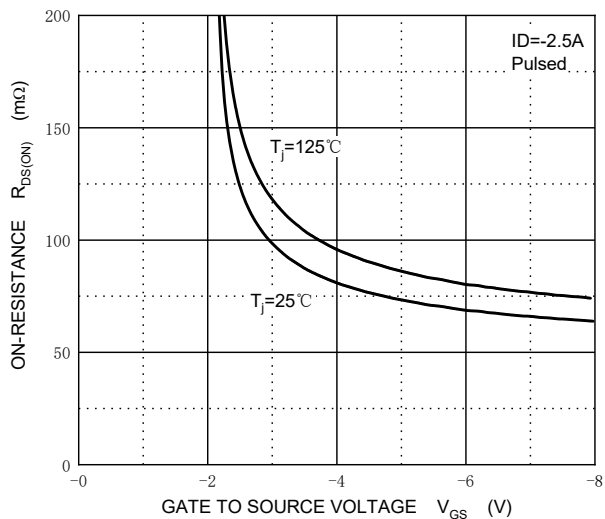
Transfer Characteristics



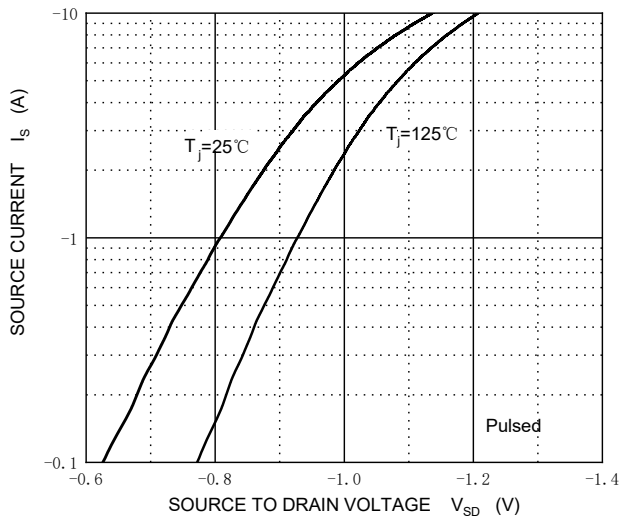
$R_{DS(ON)}$ — I_D



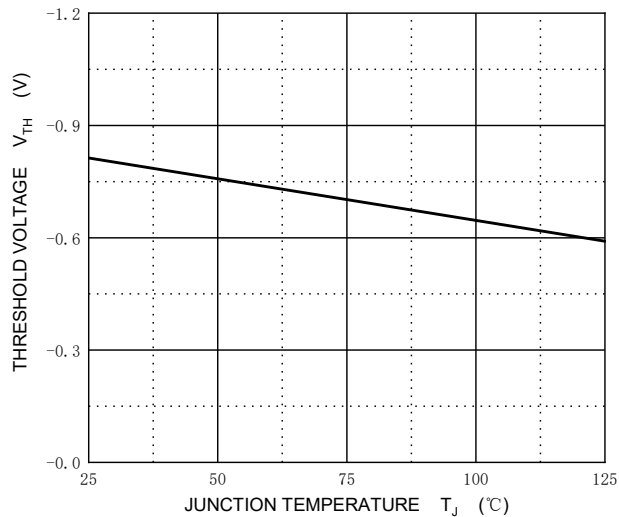
$R_{DS(ON)}$ — V_{GS}



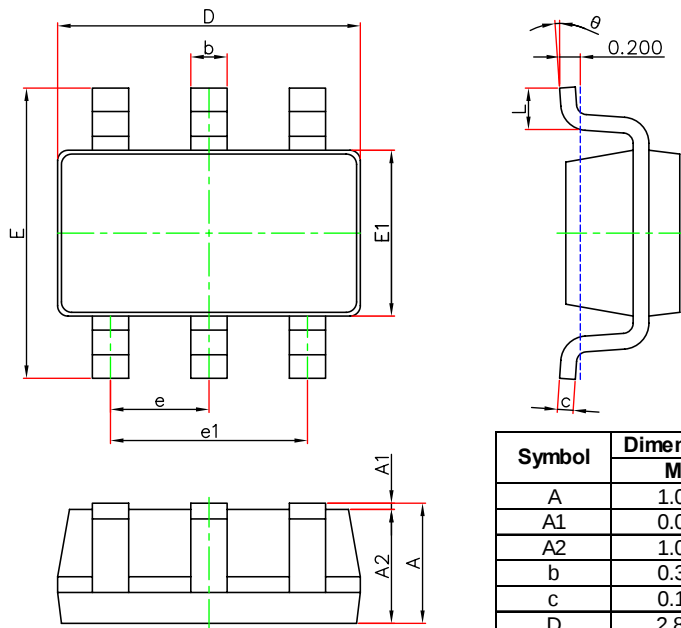
I_S — V_{SD}



Threshold Voltage

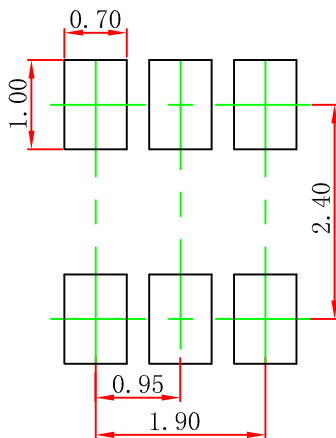


SOT-23-6L Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

SOT-23-6L Suggested Pad Layout



Note:

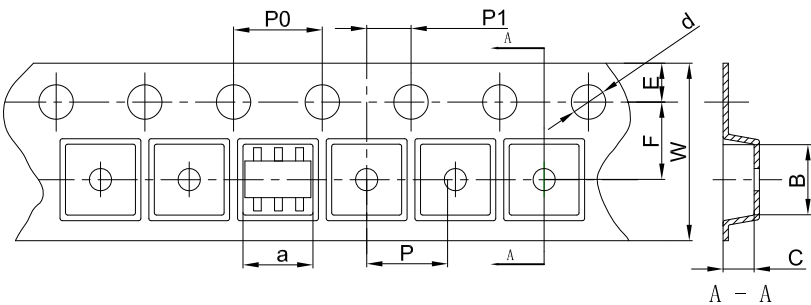
1. Controlling dimension: in millimeters.
2. General tolerance: ± 0.05 mm.
3. The pad layout is for reference purposes only.

NOTICE

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SOT-23-6L Tape and Reel

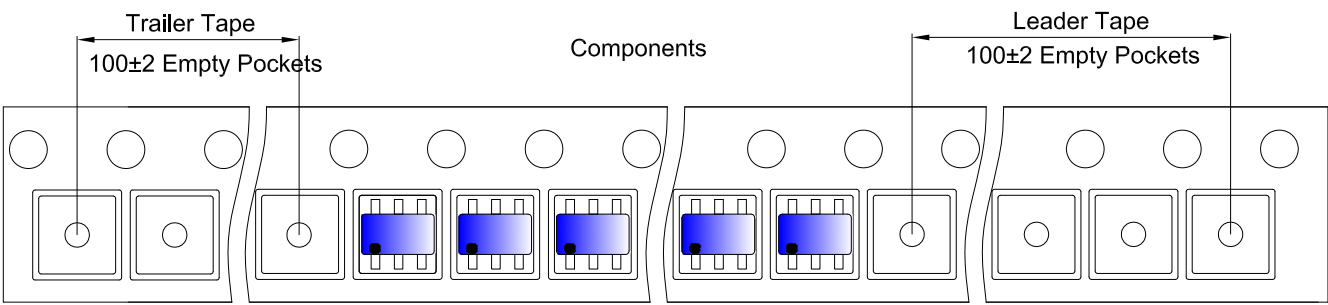
SOT-23-6L Embossed Carrier Tape



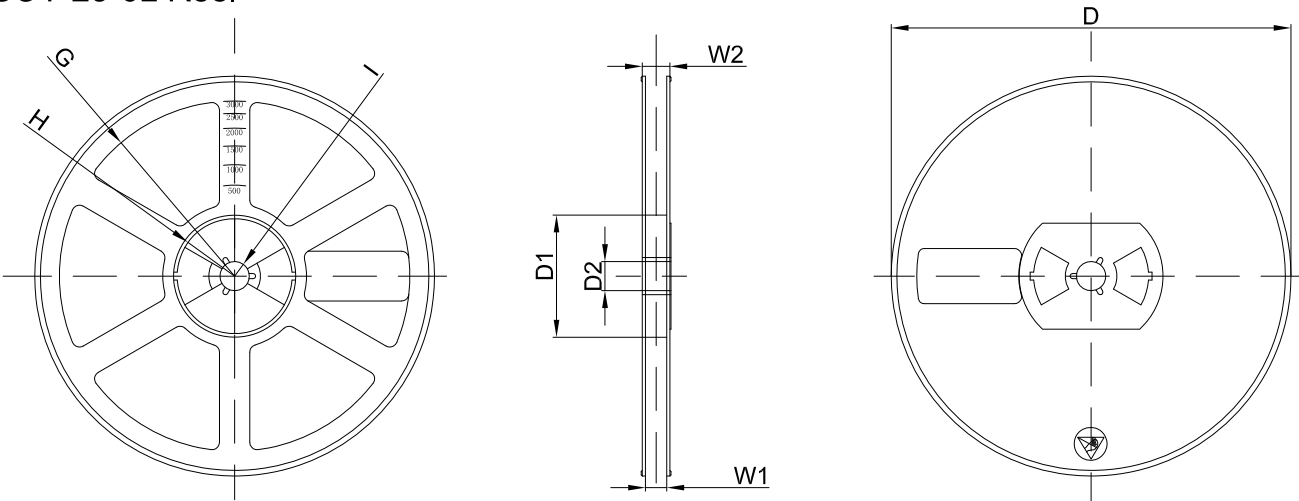
Packaging Description:
SOT-23-6L parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 3,000 units per 7" or 18.0cm 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
SOT-23-6L	3.17	3.23	1.37	Ø1.55	1.75	3.50	4.00	4.00	2.00	8.00

SOT-23-6L Tape Leader and Trailer



SOT-23-6L Reel



Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7"Dia	Ø180.00	60.00	13.00	R78.00	R25.60	R6.50	9.50	13.10

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
3000 pcs	7 inch	30,000 pcs	203×203×195	120,000 pcs	438×438×220	

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