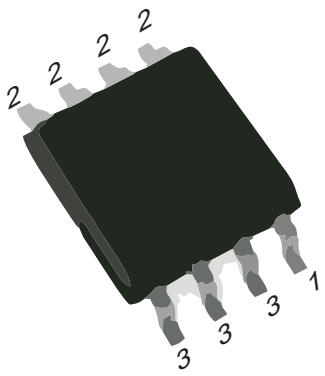
MSL120N10G

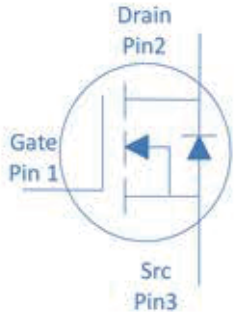
N-Channel Enhancement Mode MOSFET

■ Main Product Characteristics

V_{DS}		100V
$R_{DS(on),typ}$	V_{GS}=10V	9.5mΩ
$R_{DS(on),typ}$	V_{GS}=4.5V	11.5mΩ
I_D		12A

■ Pin Description





■ Features

- High speed power switching, logic level
- Enhanced body diode dv/dt capability
- Enhanced avalanche ruggedness
- 100% UIS tested, 100% Rg tested
- Lead free, halogen free

■ Application

- Synchronous rectification in SMPS
- Hard switching and high speed circuit
- DC/DC in telecoms and industrial

■ Absolute Maximum Ratings (T_J = 25°C unless otherwise specified)

PARAMETER	CONDITIONS	Symbol	MSL120N10G	UNIT
Continuous Drain Current (silicon limited)	T_C = 25°C	I_D	12	A
	T_C = 100°C		8	
Drain to Source Voltage		V_{DS}	100	V
Gate to Source Voltage		V_{GS}	±20	
Pulsed Drain Current		I_{DM}	60	A
Avalanche Energy, single pulse	L=0.1mH, T_C = 25°C	E_{AS}	22	mJ
Power dissipation	T_C = 25°C	P_D	3.1	W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

■ Absolute Maximum Ratings

PARAMETER	CONDITIONS	Symbol	MSL120N10G	UNIT
Thermal resistance junction-lead		$R_{\theta JL}$	23	°C/W
Thermal Resistance-Junction to Ambient	t ≤ 10s	$R_{\theta JA}$	40	
	Steady State		75	

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■ Electrical characteristics(T_A = 25°C unless otherwise specified)

■ Static characteristics

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Drain to Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	$V_{(BR)DSS}$	100			V
Gate Threshold Voltage	V_{GS} = V_{DS}, I_D = 250μA	$V_{GS(th)}$	1.4	1.9	2.4	V
Zero Gate Voltage Drain Current	V_{GS} = 0V, V_{DS} = 100V, T_J = 25°C	I_{DSS}			1	uA
	V_{GS} = 0V, V_{DS} = 100V, T_J = 100°C				100	
Gate to source Leakage Current	V_{GS} = ±20V, V_{DS} = 0V	I_{GSS}			±100	nA
Drain-Source On Resistance(note:4)	V_{GS} = 10V, I_D = 12A	$R_{DS(on)}$		9.5	12	mΩ
	V_{GS} = 4.5V, I_D = 10A			11.5	15	
Transconductance	V_{DS} = 5V, I_D = 12A	g_{fs}		45		S
Gate resistance	V_{GS} = 0V, V_{DS} open, f=1MHz	R_G		1.5		Ω

■ Dynamic Characteristics(note:5)

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Input Capacitance	V_{GS} = 0V, V_{DS} = 50V, f = 1MHz	C_{iss}		2275		pF
Output Capacitance		C_{oss}		162		
Reverse Transfer Capacitance		C_{rss}		7.9		
Total Gate Charge	V_{DS} = 50V, I_D =14A V_{GS}=10V,	Q_g(10V)		29		nC
Total Gate Charge		Q_g(4.5V)		14		
Gate-Source Charge		Q_{gs}		5		
Gate-Drain Charge		Q_{gd}		5		
Turn on Delay Time	V_{DD} = 50V, I_D = 14A, V_{GS}=10V, R_G = 10Ω	$t_{d(on)}$		8		ns
Rise Time		t_r		3		
Turn off Delay Time		$t_{d(off)}$		26		
Fall Time		t_f		4		

■ Reverse Diode Characteristics

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Diode Forward Voltage	V_{GS} = 0V, I_F = 12A	V_{SD}		0.9	1.2	V
Reverse Recovery Time	V_R = 50V, I_F = 12A, dI_F/dt = 500A/μs	t_{rr}		33		ns
Reverse Recovery Charge		Q_{rr}		157		nC

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■ Rating and characteristic curves

Fig 1. Typical Output Characteristics

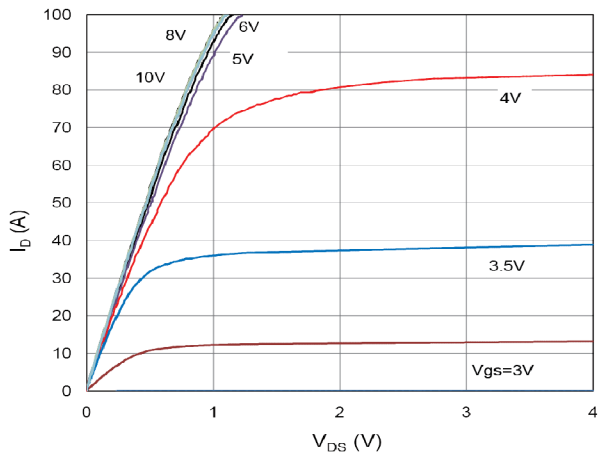


Figure 2. On-Resistance vs. Gate-Source Voltage

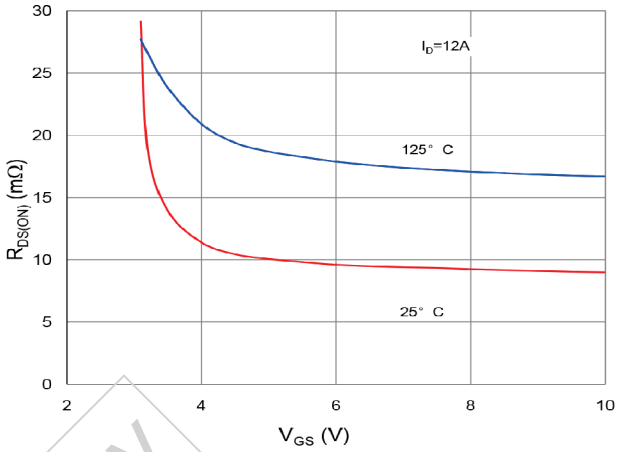


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

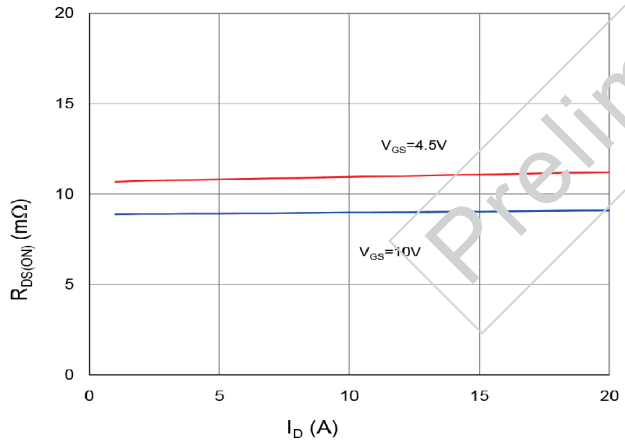


Figure 4. Normalized On-Resistance vs. Junction Temperature

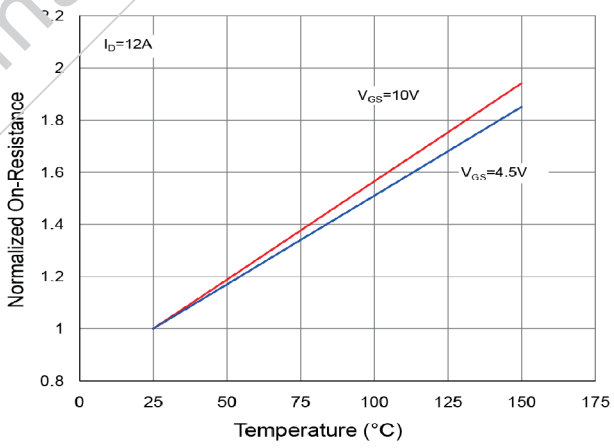


Figure 5. Typical Transfer Characteristics

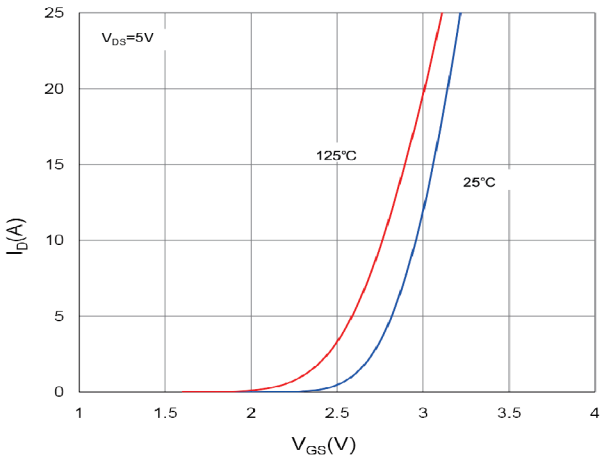
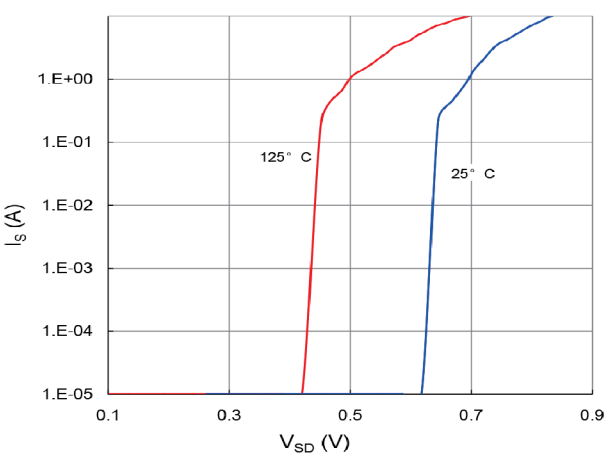


Figure 6. Typical Source-Drain Diode Forward Voltage



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■ Rating and characteristic curves

Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

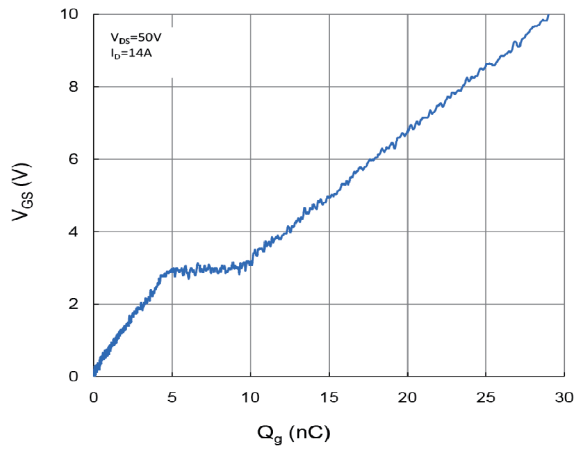


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

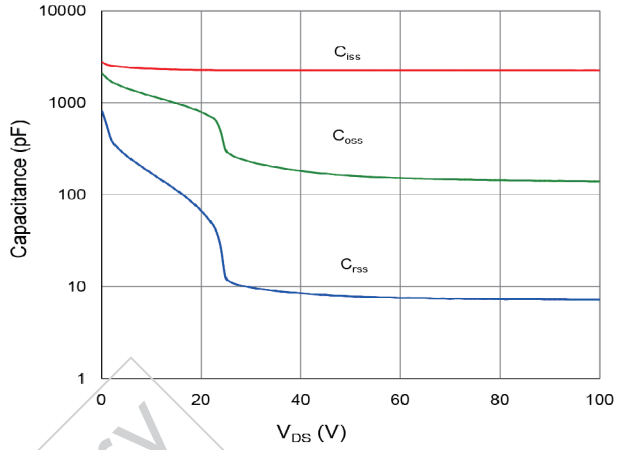


Figure 9. Maximum Safe Operating Area

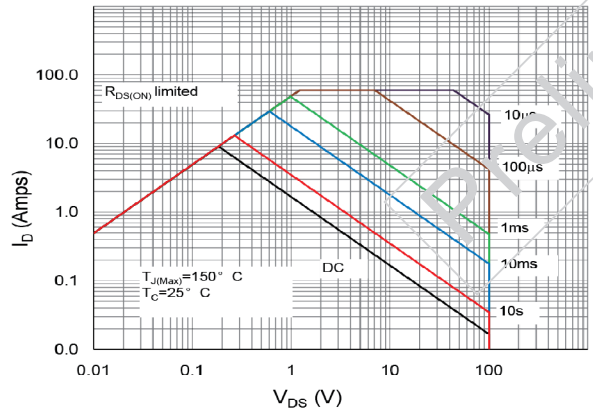


Figure 10. Maximum Drain Current vs. Case Temperature

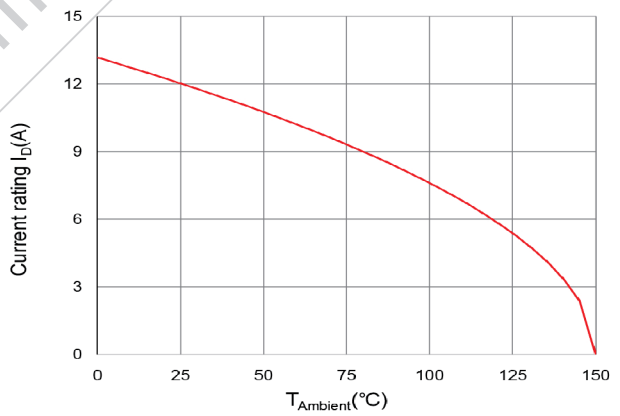
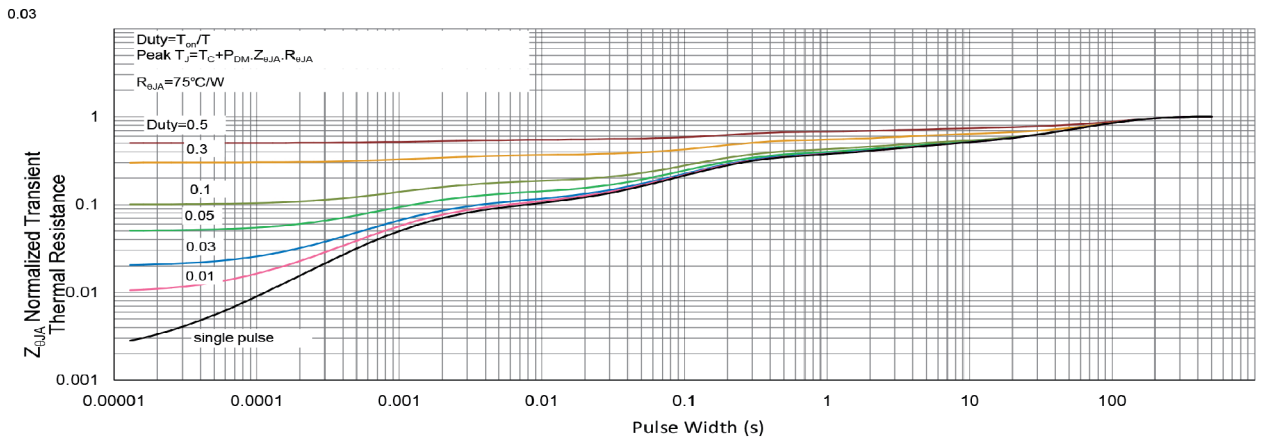


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Ambient



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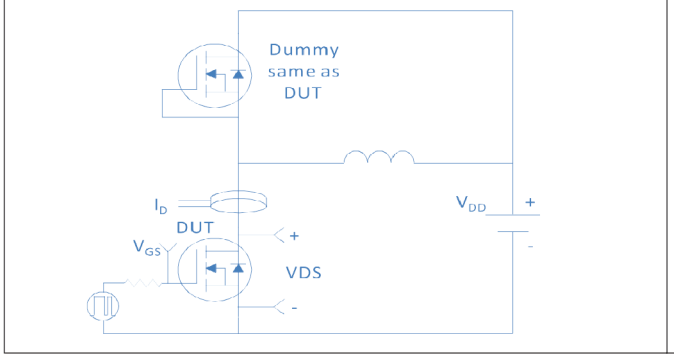
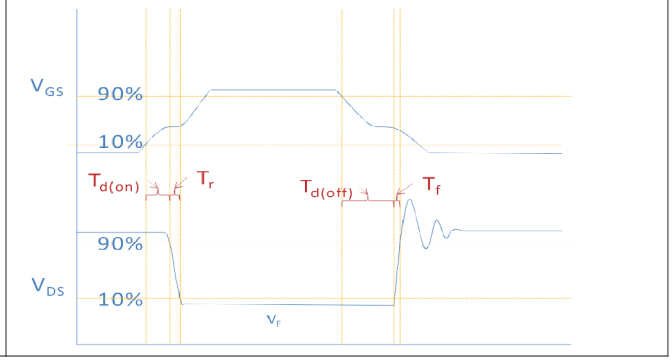
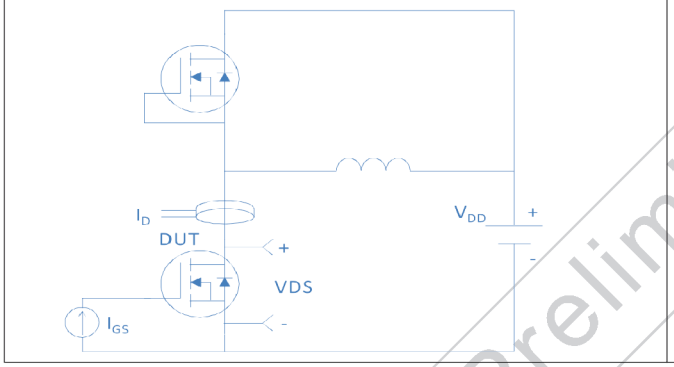
■ Rating and characteristic curves

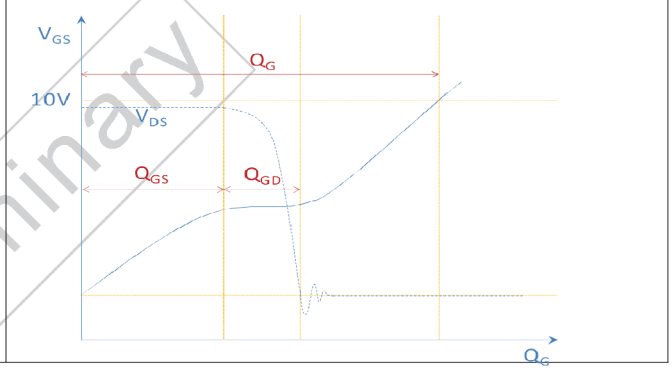
Inductive switching Test



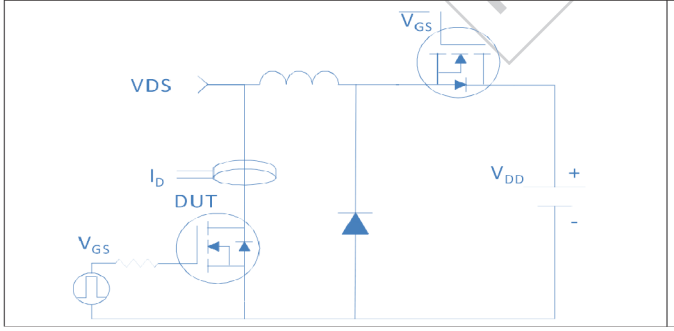


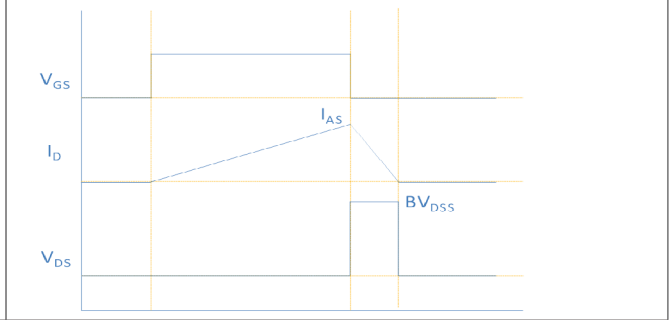
Gate Charge Test



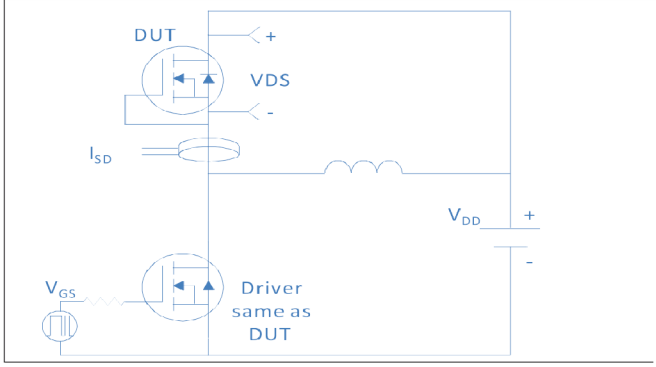


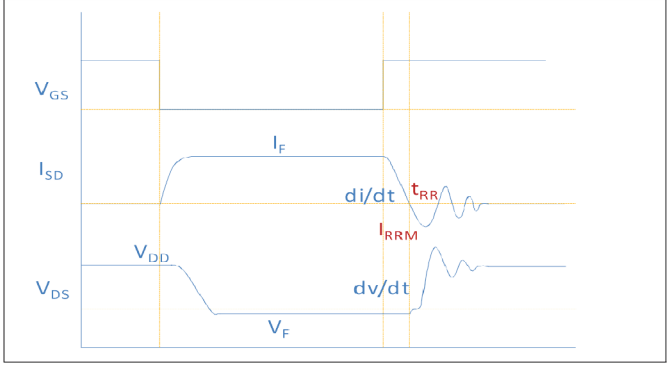
Uclamped Inductive Switching (UIS) Test





Diode Recovery Test





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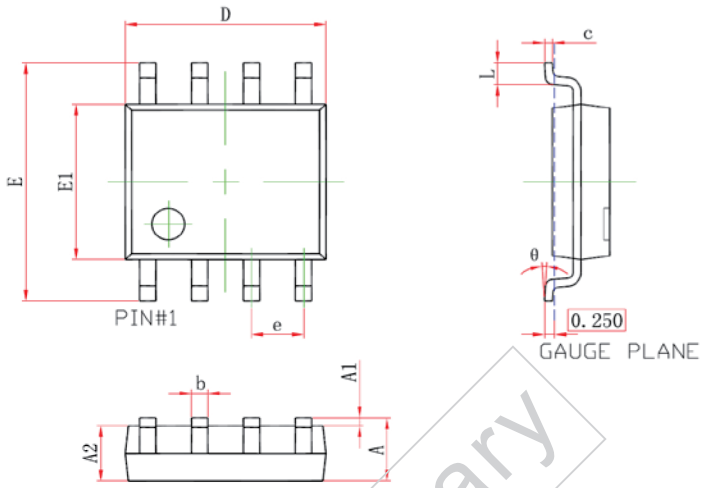
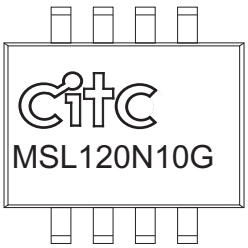
■ Package Outline

SOIC-8, 8 leads



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.800	5.000	0.189	0.197
e	1.270 (BSC)		0.050 (BSC)	
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
L	0.400	1.270	0.016	0.031
θ	0°	8°	0°	8°

■ Marking information



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