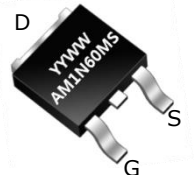
600V 1.2A Advanced N-Ch Power MOSFET

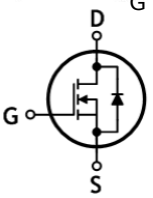
FEATURES

- Drain-Source breakdown voltage: BVDSS=600V (Min.)
- Low Crss : Crss=3.4pF(Typ.)
- Low gate charge : Qg=3.9nC(Typ.)
- Low RDS(on) : RDS(on)=11.5Ω(Max.)

AM1N60MS
SOT-223

AM1N60MD
TO-252





Marking Information

Row 1 : Date Code

- YY : Year Code
- WW : Week Code

Row 2 : Product Information

Ordering Information

Part No	Package	Packing	Finish	Halogen	Packing Unit
AM1N60MS	SOT-223	Tape & Reel	Sn	Free	2,500ea
AM1N60MD	TO-252	Tape & Reel	Sn	Free	2,500ea

Maximum Ratings (Tc=25 °C, unless otherwise noted)

Characteristic	Symbol		Rating	Unit
Drain-source voltage	V_{DSS}		600	V
Gate-source voltage	V_{GSS}		±30	V
Drain current (DC)*	I_D	Tc = 25℃	1.2	A
		Tc = 100℃	1.2	
Drain current (Pulsed)*	I_{DM}		1.2	A
Single avalanche current (Note 2)	I_{AS}		1.2	A
Single pulsed avalanche energy (Note 2)	E_{AS}		53	mJ
Repetitive avalanche current (Note 1)	I_{AR}		0.3	A
Repetitive avalanche energy (Note 1)	E_{AR}		1.1	mJ
Power dissipation	P_D	SOT-223	8	W
		TO-252	28	
Junction Temperature	T_J		150	℃
Storage temperature range	T_{stg}		-55~150	℃

* **Limited only maximum junction temperature**

Thermal Characteristic

Characteristic	Symbol		Rating	Unit
Thermal resistance, junction to case	$R_{th(j-c)}$	SOT-223	14	℃/W
		TO-252	4.53	
Thermal resistance, junction to ambient	$R_{th(j-a)}$	SOT-223	150	
		TO-252	110	

Electrical Characteristics (T_C=25 °C, unless otherwise noted)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Drain-source breakdown voltage	BV_{DSS}	I_D = 250uA, V_{GS}= 0	600	-	-	V
Gate threshold voltage	$V_{GS(th)}$	I_D = 250uA, V_{DS} = V_{GS}	2.0	-	4.0	V
Drain-source cut-off current	I_{DSS}	V_{DS} = 600V, V_{GS} = 0V	-	-	1	uA
Gate leakage current	I_{GSS}	V_{DS} = 0V, V_{GS} = ±30V	-	-	±100	nA
Drain-source on-resistance(Note 4)	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 0.15A	-	9.3	11.5	Ω
Forward transfer conductance (Note 4)	g_{fs}	V_{DS} = 10V, I_D = 0.15A	-	0.32	-	S
Input capacitance	C_{iss}	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz	-	131	164	pF
Output capacitance	C_{oss}		-	19.4	24.3	
Reverse transfer capacitance	C_{rss}		-	3.4	4.3	
Turn-on delay time (Note 3,4)	$T_{d(on)}$	V_{DS} = 350V, I_D = 0.3A, RG = 25Ω	-	5.5	-	ns
Rise time (Note 3,4)	T_r		-	5	-	
Turn-off delay time (Note 3,4)	$t_{d(off)}$		-	13	-	
Fall time (Note 3,4)	t_f		-	28	-	
Total gate charge (Note 3,4)	Q_g	V_{DS} = 480V,V_{GS} = 10V I_D = 0.3A	-	3.9	4.9	nC
Gate-source charge (Note 3,4)	Q_{gs}		-	1.7	-	
Gate-drain charge (Note 3,4)	Q_g		-	0.85	-	

Source-Drain Diode Ratings and Characteristics (T_C=25 °C, unless otherwise noted)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Source current (DC)	I_S	Integral reverse diode in the MOSFET	-	-	0.3	A
Source current (Pulsed)(Note 1)	I_{SM}		-	-	1.2	A
Forward voltage(Note 4)	V_{SD}	V_{GS} = 0V, I_S = 0.3A	-	-	1.4	V
Reverse recovery time	t_{rr}	I_S = 0.3A, V_{GS} = 0V dIF/dt = 100A/us	-	190	-	ns
Reverse recovery charge	Q_{rr}		-	0.53	-	uC

Note :

1. Repetitive rating : Pulse width limited by maximum junction temperature
2. L=1080mH, IAS=0.3A, VDD=50V, RG=25Ω, Starting TJ=25℃
3. Pulse Test : Pulse width≤300us, Duty cycle≤2%
4. Essentially independent of operating temperature

Typical Electrical Characteristic

Electrical Characteristic Curves

Fig. 1 I_D - V_{DS}

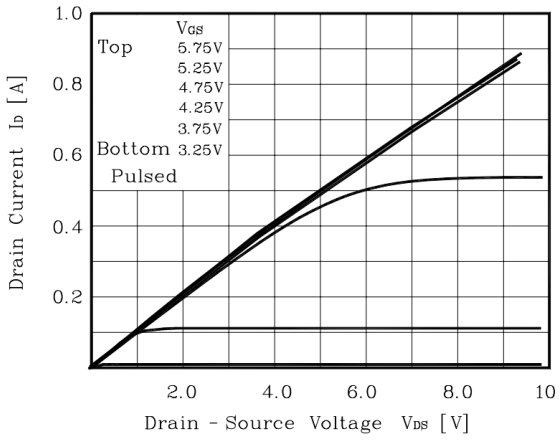


Fig. 2 I_D - V_{GS}

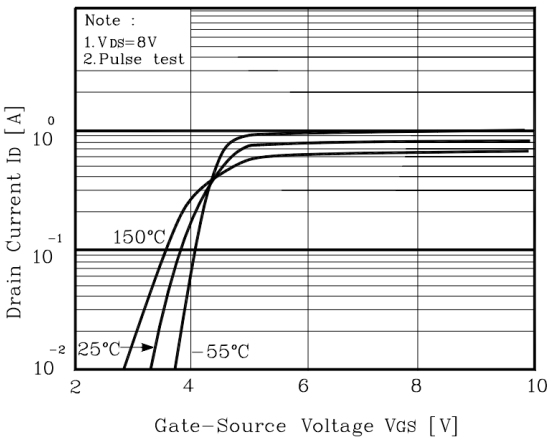


Fig. 3 $R_{DS(on)}$ - I_D

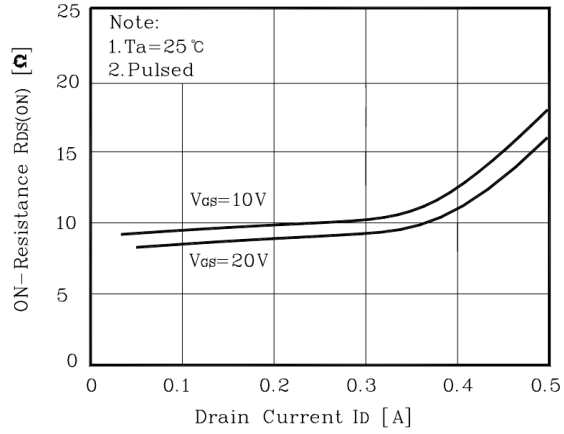


Fig. 4 I_S - V_{SD}

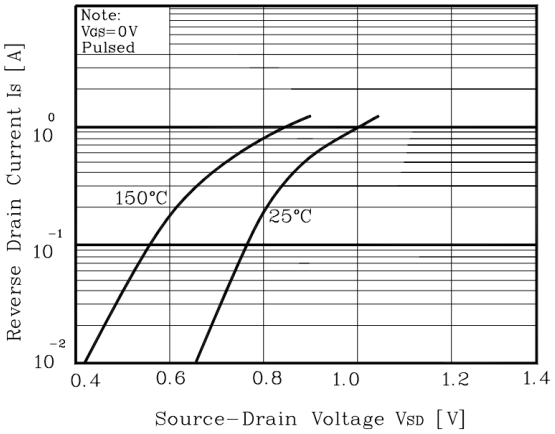


Fig. 5 Capacitance - V_{DS}

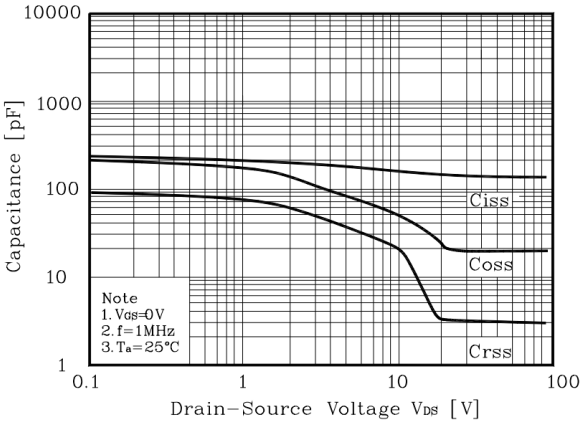


Fig. 6 V_{GS} - Q_G

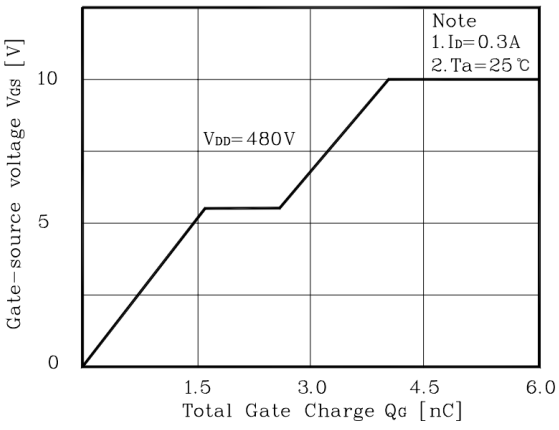


Fig. 7 V_{DSS} - T_J

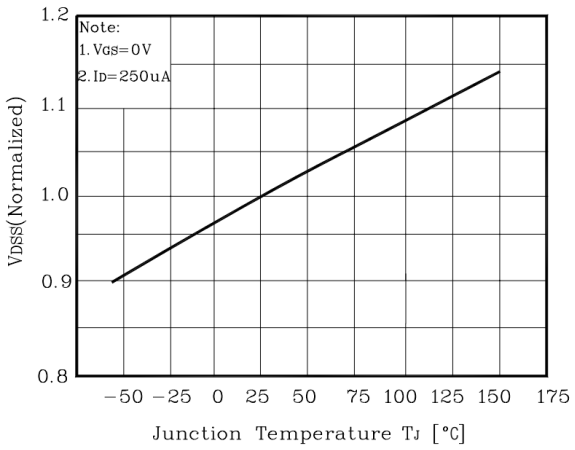


Fig. 8 $R_{DS(on)}$ - T_J

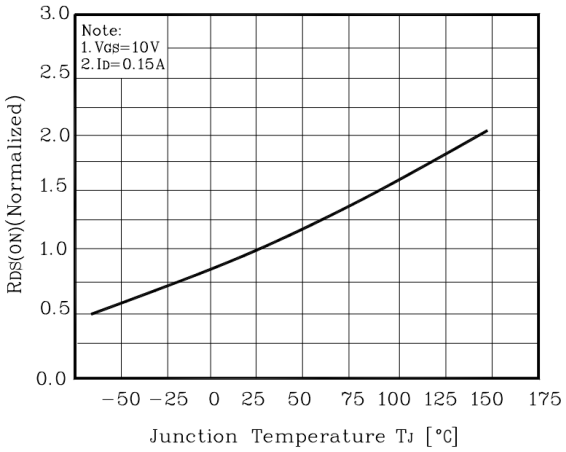


Fig. 9 I_D - T_a

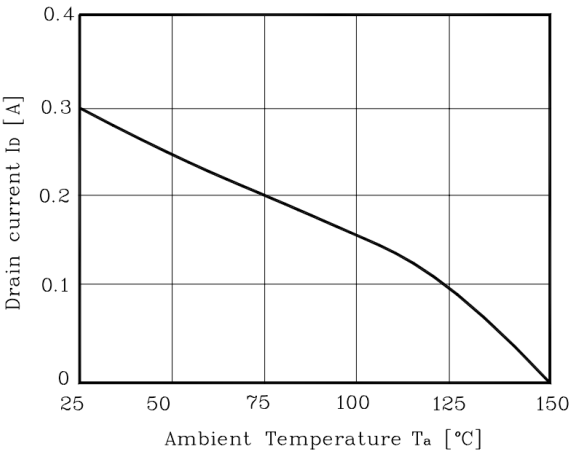


Fig. 10 Safe Operating Area

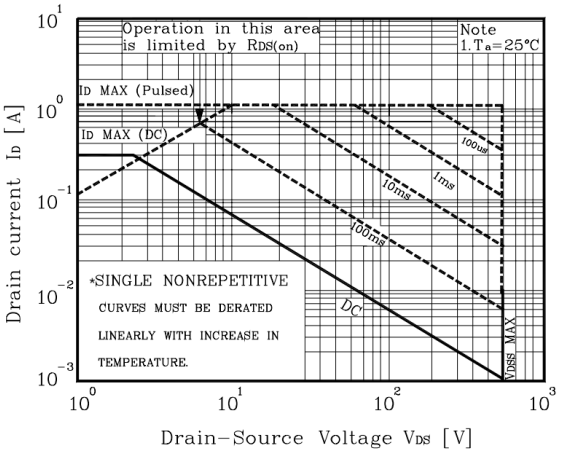


Fig. 11 Gate Charge Test Circuit & Waveform

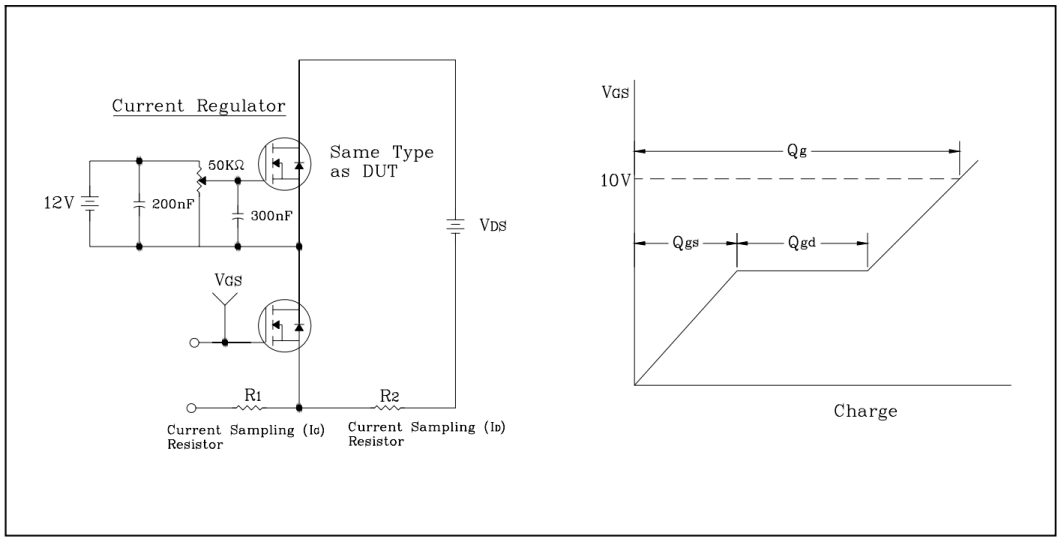


Fig. 12 Resistive Switching Test Circuit & Waveform

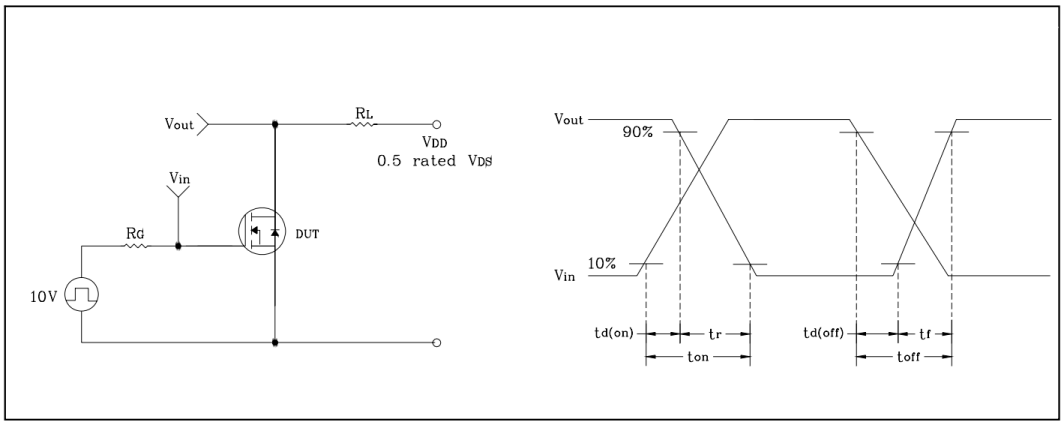


Fig. 13 E_{AS} Test Circuit & Waveform

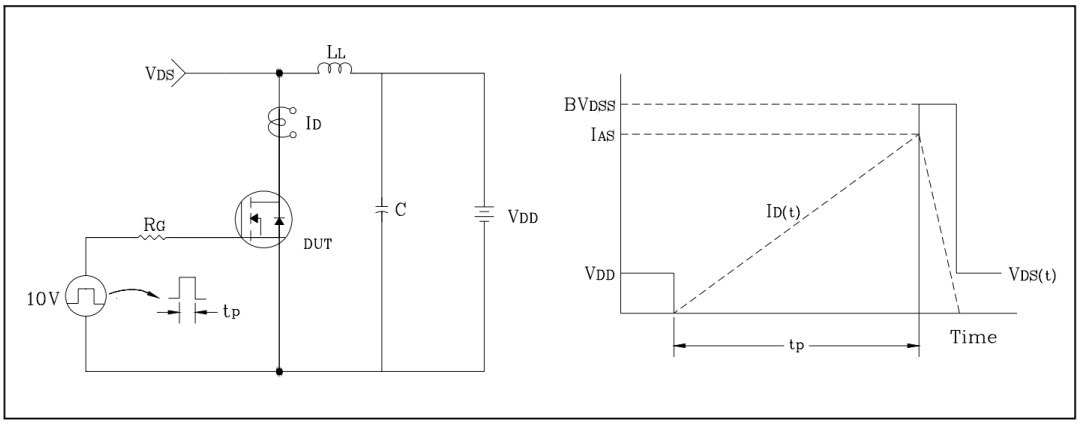
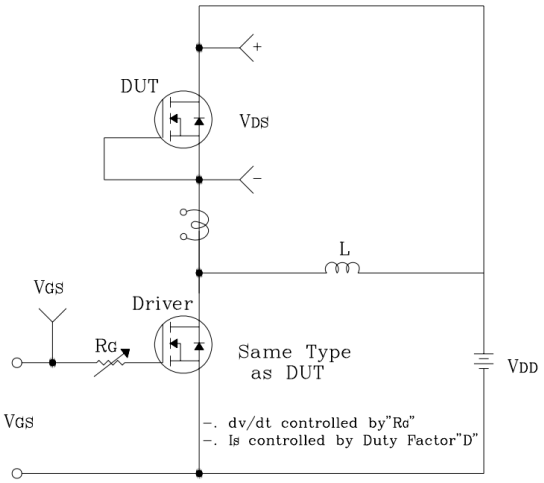
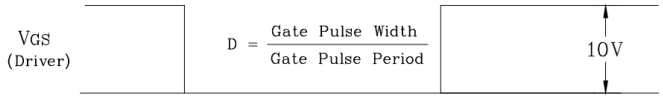
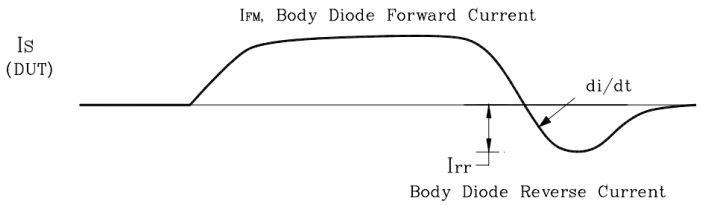
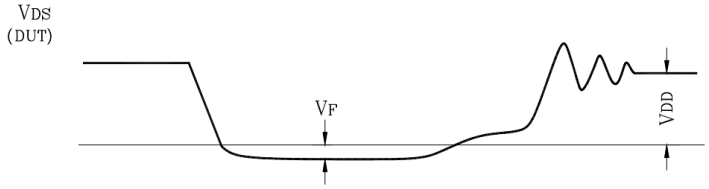


Fig. 14 Diode Reverse Recovery Time Test Circuit & Waveform



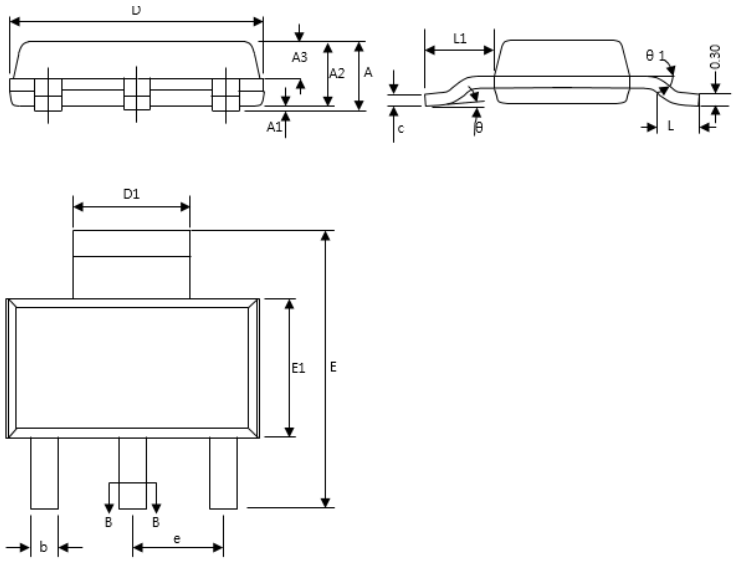






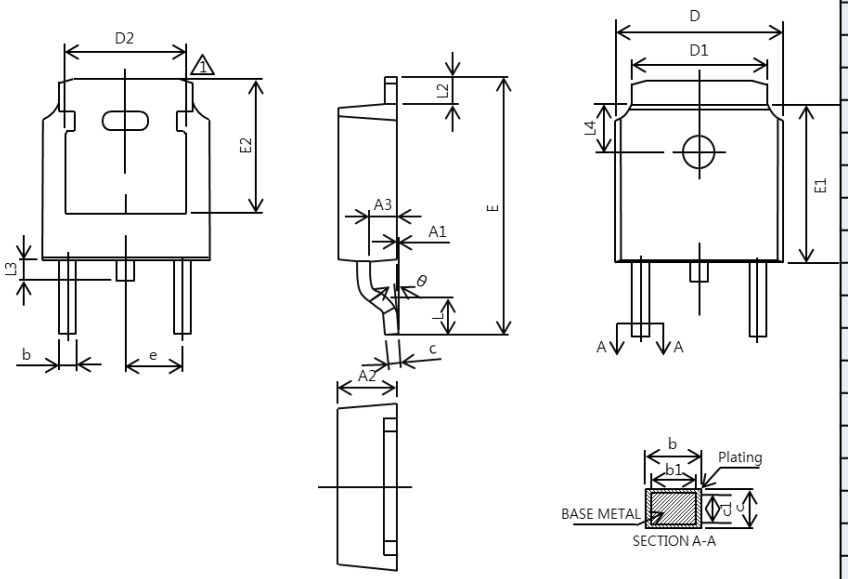
Package Dimensions

SOT-223



SOT-223-3L unit : mm			
DIM	MIN	NOM	MAX
A	1.50	1.65	1.80
A1	0.03	0.06	0.09
A2	1.45	1.60	2.75
A3	0.80	0.90	1.00
D	6.30	6.50	6.70
D1	3.00REF		
E	6.80	7.00	7.20
E1	3.40	3.50	3.60
e	2.30BSC		
	0.90	—	—
L1	1.75BSC		
	0	—	7
	37.5 REF		

TO-252



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A1	0	_	0.10
A2	2.2	2.3	2.4
A3	1.02	1.067	1.12
b	0.75	_	0.84
b1	0.74	_	0.79
c	0.49	_	0.57
c1	0.48	0.508	0.52
D	6.50	6.60	6.70
D1	5.334REF		
D2	4.70	4.826	4.92
E	9.90	10.10	10.30
E1	6.00	6.10	6.20
E2	5.30REF		
e	2.286BSC		
L	1.40	1.50	1.60
L2	0.90	_	1.25
L3	0.60	0.80	1.00
L4	1.70	1.80	1.90
Θ	0		8°
L/F	198×133		

Revision History

No	Date	Contents
0	2019-01-29	Initial Brief Datasheet Release

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