P-Channel 30V(D-S) MOSFET

Product summary		
V_{DS}	-30	V
$R_{DS(ON)}$(at V_{GS}=-10V) Typ.	55	mΩ
$R_{DS(ON)}$(at V_{GS}=-4.5V) Typ.	67	mΩ
ID(TA=25℃)	-3.5	A

Features

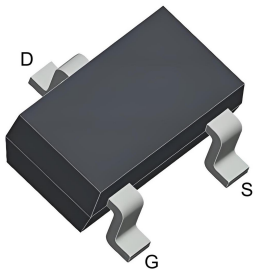
- Trench Power LV MOSFET technology
- High Speed switching
- High density cell design for Low $R_{DS(ON)}$

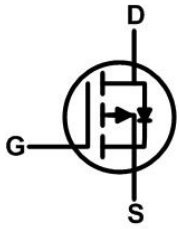
Applications

- Power management
- Load switch

Pin Configuration

SOT-23





Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
ECDA3403	SOT-23	7″	3000pcs

Absolute Maximum Ratings (at T_A=25℃ Unless Otherwise Noted)

Symbol	Parameter		Rating	Units
V_{DS}	Drain-Source Voltage		-30	V
V_{GS}	Gate-Source Voltage		±12	V
I_D	Continuous Drain Current at V_{GS}=-10V	T_A=25℃	-3.5	A
		T_A=70℃	-2.8	A
I_{DM}	Pulse Drain Current Tested [A]		-16	A
P_D	Power Dissipation	T_A=25℃	1.2	W
T_J,T_{STG}	Junciton and Storage Temperature Range		-55 to +150	℃

Thermal Characteristics

Symbol	Parameter	Typical	Units
$R_{\theta JA}$	Thermal Resistance-Junction to ambient [B]	104	℃/W

Electrical Characteristics (at T_J =25℃ Unless Otherwise Noted)

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=-250uA	-30	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-30V,V_{GS}=0V	--	--	-1	uA
I_{GSS}	Gate-Body Leakage Current	V_{DS}=0V,V_{GS}=±12V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=-250uA	-0.5	-0.95	-1.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance [C]	V_{GS}=-10V,I_D=-4.4A	--	55	71	mΩ
		V_{GS}=-4.5V,I_D=-4A	--	67	87	mΩ
		V_{GS}=-2.5V,I_D=-2A	--	105	131	mΩ
V_{SD}	Forward Voltage	I_S=-3.5A,V_{GS}=0V	--	--	-1.2	V
I_S	Maximum Body-Diode Continuous Current		--	--	-3.5	A
Dynamic Parameters [D]						
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=-15V f=1MHZ	--	360	--	pF
C_{oss}	Output Capacitance		--	39	--	pF
C_{rss}	Reverse Transfer Capacitance		--	33	--	pF
Q_g	Total Gate Charge	V_{DS}=-15V,I_D=-3A V_{GS}=0 to -10V	--	6.5	--	nC
Q_{gs}	Gate-Source Charge		--	1.4	--	nC
Q_{gd}	Gate-Drain Charge		--	1.7	--	nC
$t_{D(on)}$	Turn-on Delay Time	V_{DD}=-15V ,I_D=-3A, R_{GEN}=3Ω, V_{GS}=-4.5V	--	10	--	nS
t_r	Turn-on Rise Time		--	86	--	nS
$t_{D(off)}$	Turn-off Delay Time		--	150	--	nS
t_f	Turn-off Fall Time		--	357	--	nS
t_{rr}	Reverse recovery time	I_F=-3A, di/dt=100 A/uS	--	35	--	ns
Q_{rr}	Reverse recovery charge		--	5	--	nC

A. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

B. Device mounted on FR-4 PCB, 1 inch x 1 inch x 0.062 inch.

C. Pulse Test: Pulse Width≤300us,Duty cycle ≤0.5%.

D. Guaranteed by design, not subject to production testing.

Typical Characteristics

Figure 1: Output Characteristics

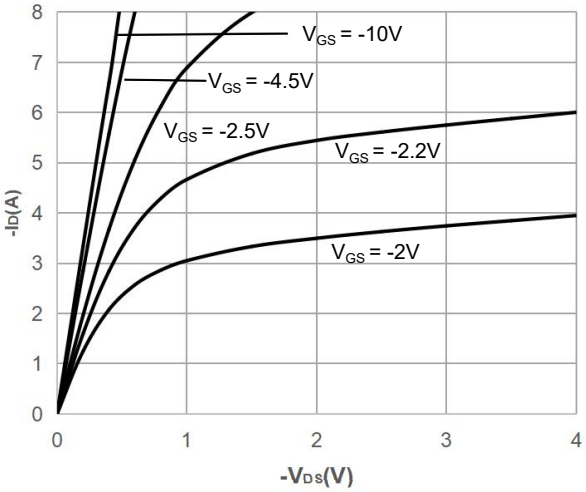


Figure 2: Typical Transfer Characteristics

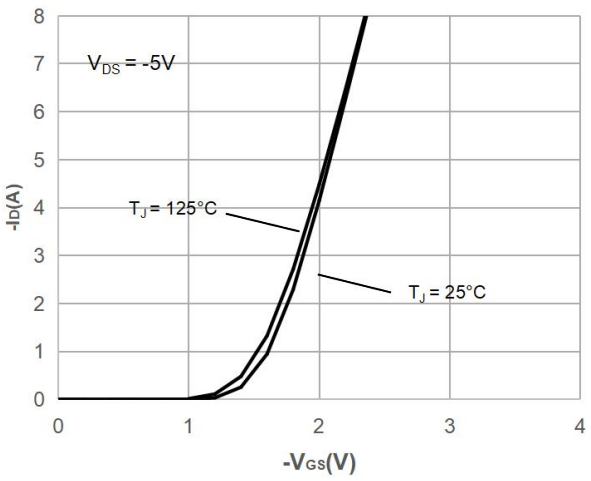


Figure 3: On-resistance vs. Drain Current

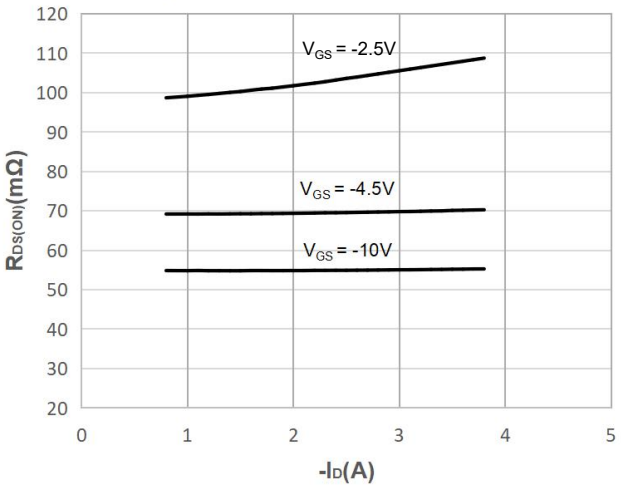


Figure 4: Body Diode Characteristics

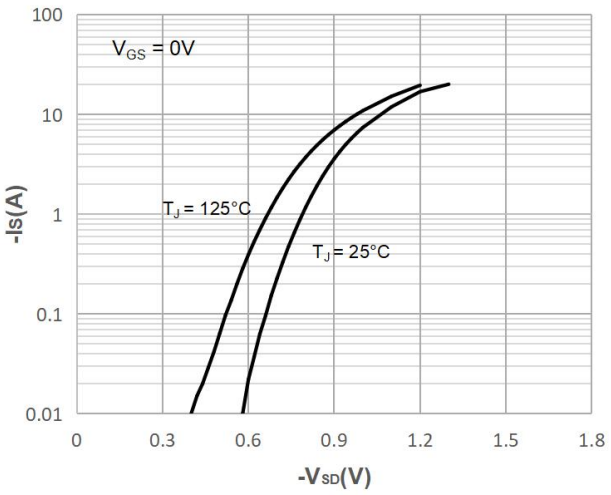


Figure 5: Gate Charge Characteristics

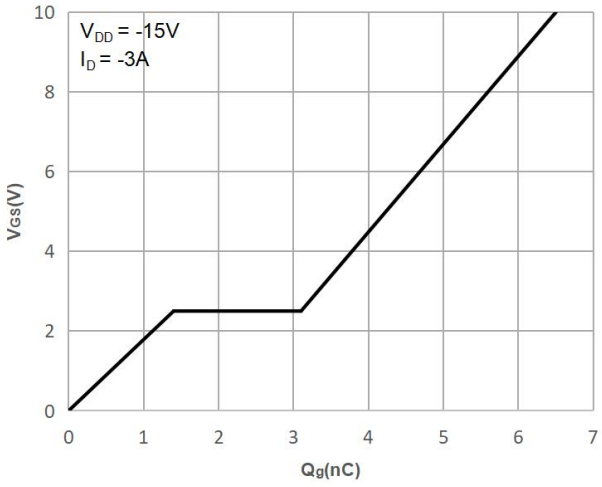
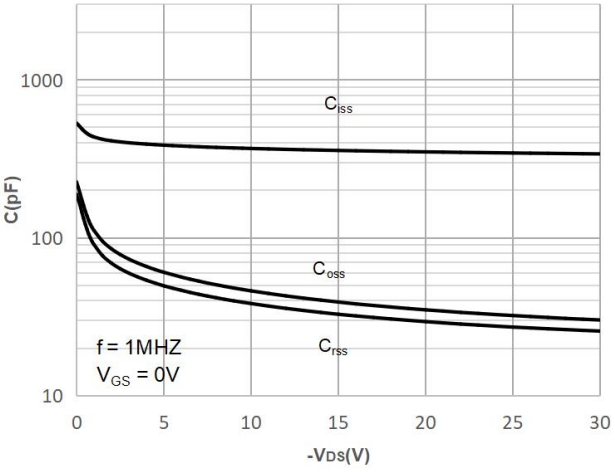


Figure 6: Capacitance Characteristics



Typical Characteristics

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

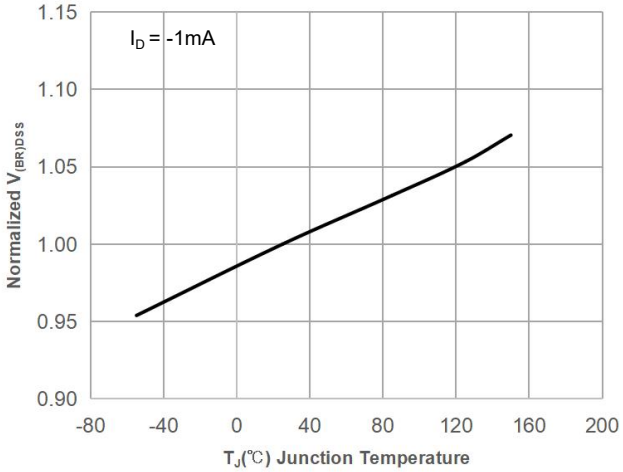


Figure 8: Normalized on Resistance vs. Junction Temperature

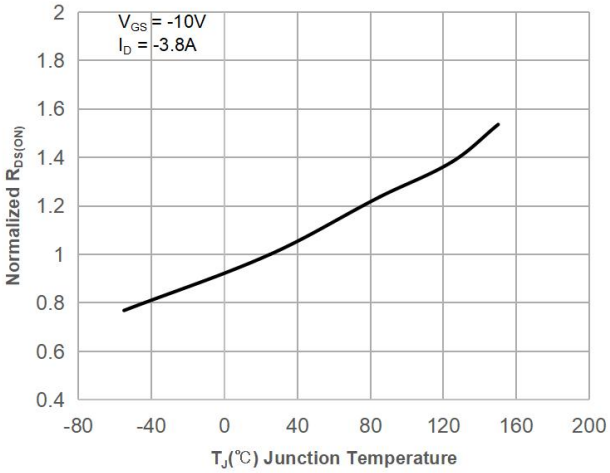


Figure 9: Maximum Safe Operating Area

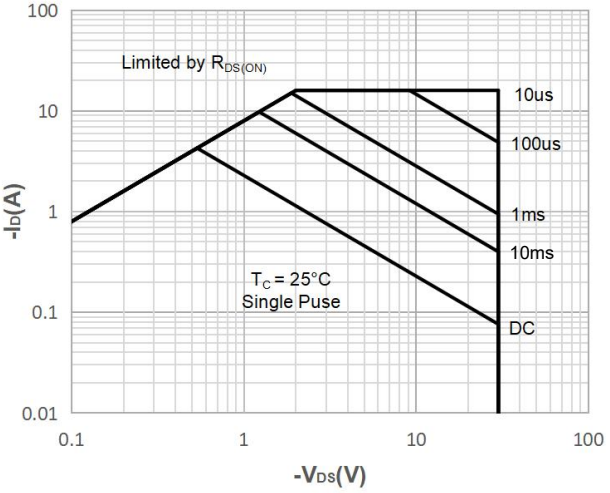


Figure 10: Maximum Continuous Drian Current vs. Case Temperature

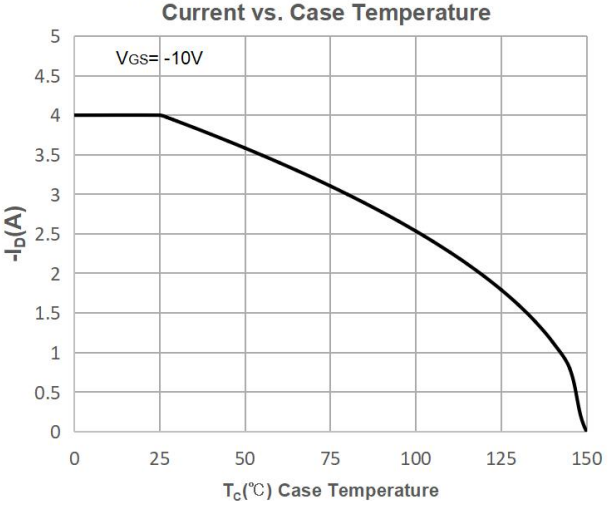


Figure 11: Normalized Maximum Transient Thermal Impedance

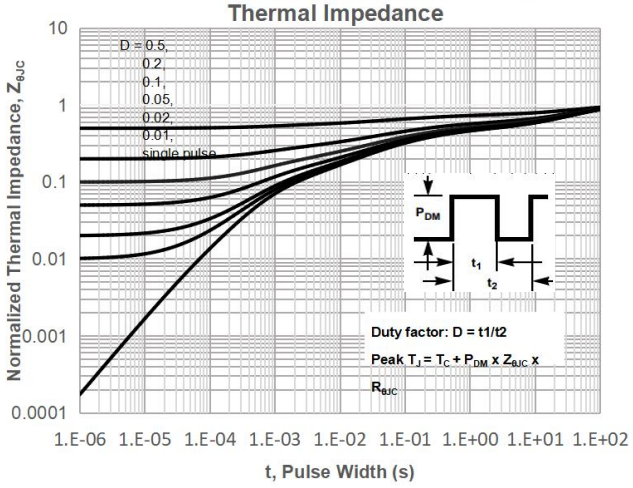
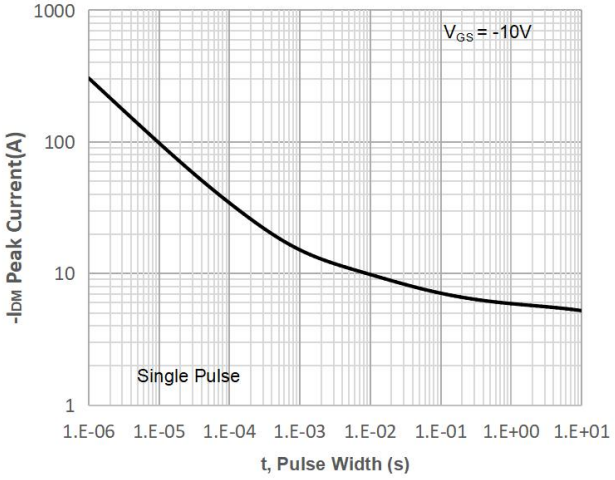


Figure 12: Peak Current Capacity



Test Circuit

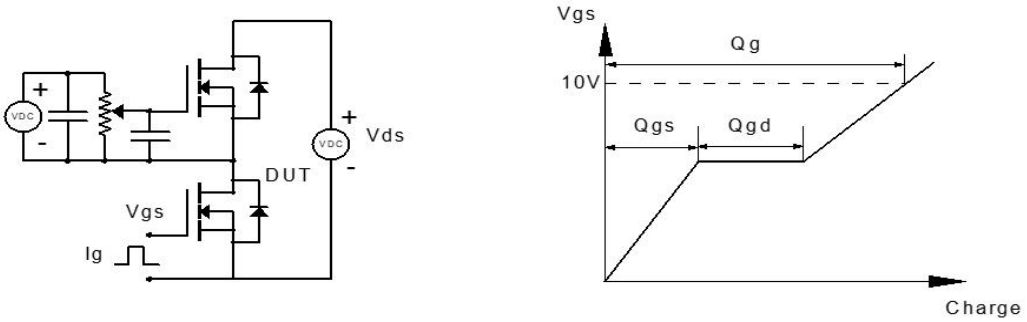


Figure 1: Gate Charge Test Circuit & Waveform

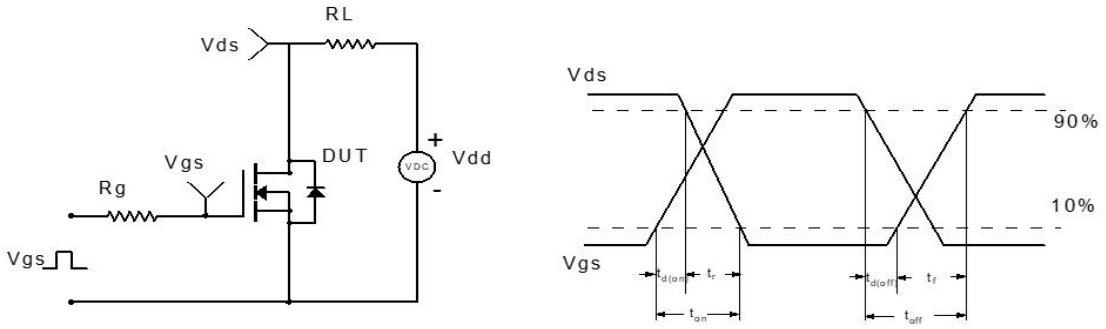


Figure 2: Resistive Switching Test Circuit & Waveform

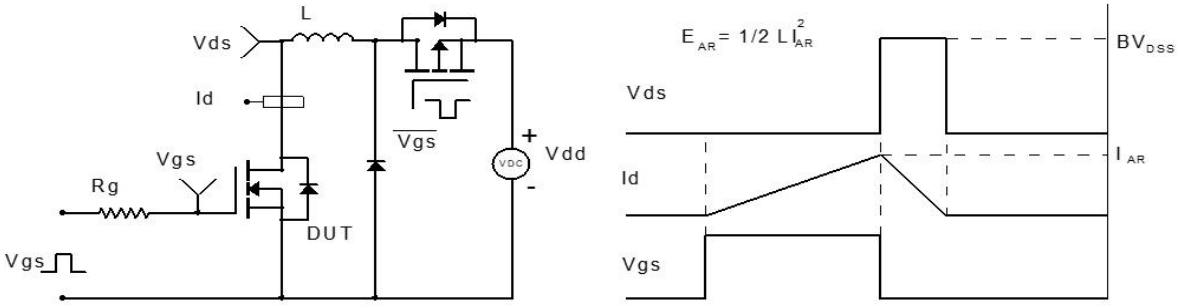


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

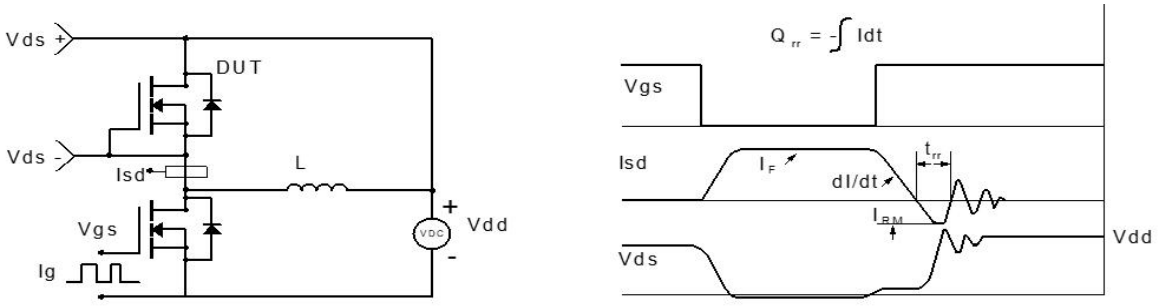
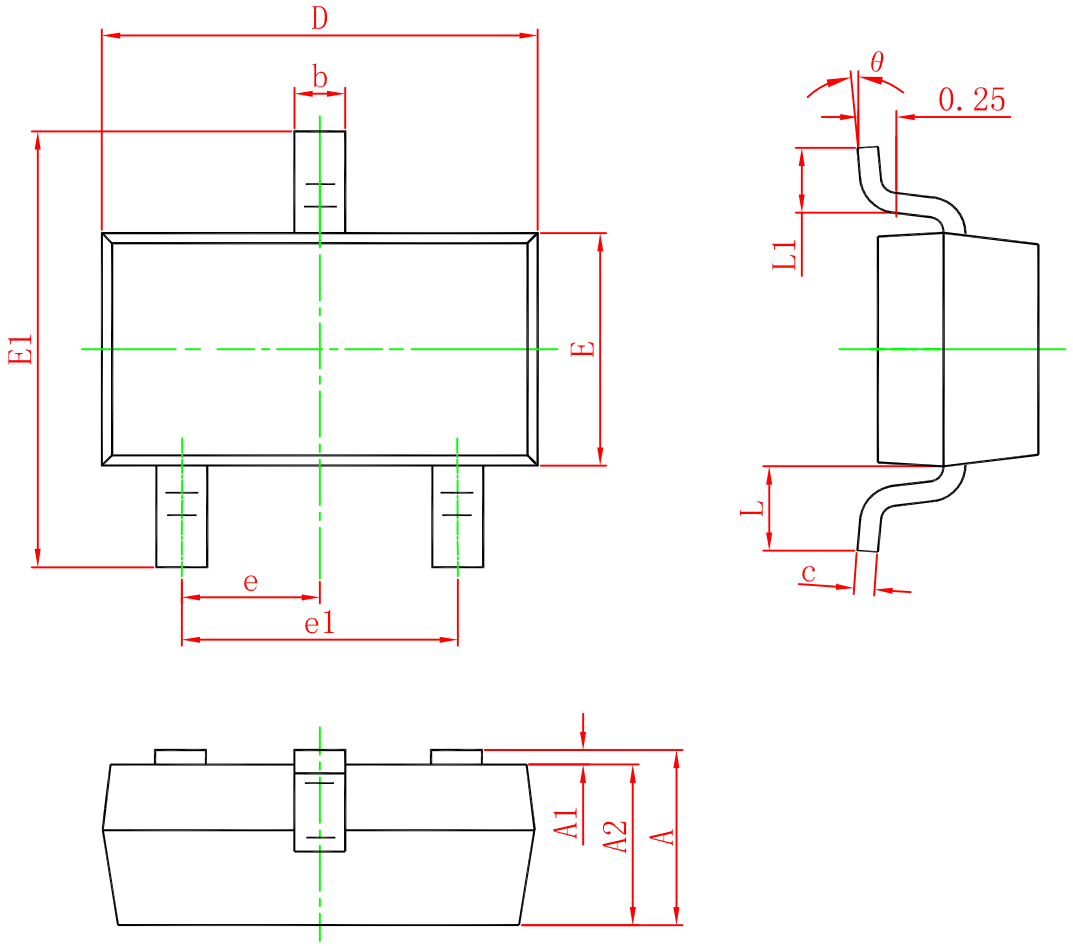


Figure 4: Diode Recovery Test Circuit & Waveform

SOT-23 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°