

Description

Features

- Trench Power LV MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

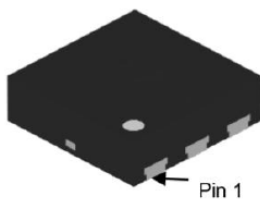
Application

- High current load application
- Load switching
- Quick Charge

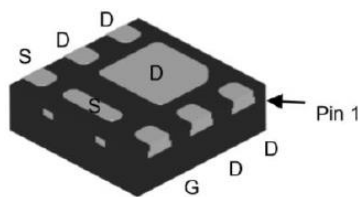
V_{DS}	-16	V
$R_{ds(on),typ}@V_{gs}=-4.5V$	16	mΩ
$R_{ds(on),typ}@V_{gs}=-2.5V$	21	mΩ
I_D	-12	A



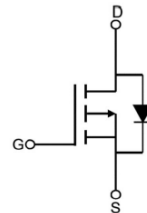
Top View



Bottom View



Pin Configuration



Package Marking and Ordering Information

Part	Marking	Package	Packing	Reel Size	Tape Width	Qty
CMT10P12V	T10P12V	DFN2*2	Reel	NA	NA	3000pcs

Key Performance Parameters

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-16	V
V_{GS}	Gate-Source Voltage	± 10	V
$I_D@T_c=25^{\circ}C$	Continuous Drain Current, $V_{GS}=-4.5V$	-12	A
$I_D@T_c=100^{\circ}C$	Continuous Drain Current, $V_{GS}=-4.5V$	-8.6	A
IDM	Pulsed Drain Current ¹	-48	A
$PD@T_c=25^{\circ}C$	Total Power Dissipation	4.1	W
T_{STG}	Storage Temperature Range	-55 to 150	$^{\circ}C$
T_j	Operating Junction Temperature Range	-55 to 150	$^{\circ}C$

Thermal Data

Symbol	Parameter	Typ	Max	Units
$R_{\theta JC}$	Thermal Resistance Junction-Case	24	30	°C/W

Electrical Characteristics ($T_J=25\text{ }^{\circ}\text{C}$, Unless otherwise noted)

Symbol	Parameter	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
BVDSS	Drain-Source Breakdown Voltage	--	--	-16	V	$V_{GS}=0V$, $I_D=-250\mu A$
$R_{DS(ON)}$	Static Drain-Source On-Resistance	--	16	28	$m\Omega$	$V_{GS}=-4.5V$, $I_D=-2A$
		--	21	40		$V_{GS}=-2.5V$, $I_D=-1A$
$V_{GS(th)}$	Gate Threshold Voltage	-1.2	-0.6	-0.4	V	$V_{GS}=V_{DS}$, $I_D=-250\mu A$
IDSS	Drain-Source Leakage Current	-1	--	--	μA	$V_{DS}=-16V$, $V_{GS}=0V$, $T_J=25^{\circ}\text{C}$
		-10	--	--	μA	$V_{DS}=-12.8V$, $V_{GS}=0V$, $T_J=125^{\circ}\text{C}$
IGSS	Gate-Source Leakage Current	--	--	± 100	nA	$V_{GS}=\pm 10V$, $V_{DS}=0V$
R_g	Gate Resistance	--	15.6	--	Ω	$V_{DS}=0V$, $V_{GS}=0V$, $f=1\text{MHz}$
Q_g	Total Gate Charge ^{2,3}	--	11	--	nC	$V_{DS}=-8V$, $V_{GS}=-4.5V$, $I_D=-2A$
Q_{gs}	Gate-Source Charge ^{2,3}	--	1.8	--		
Q_{gd}	Gate-Drain Charge ^{2,3}	--	3.2	--		
$T_{d(on)}$	Turn-On Delay Time ^{2,3}	--	12	--	ns	$V_{DD}=-8V$, $V_{GS}=-4.5V$, $R_G=3\Omega$ $I_D=-2A$
T_r	Rise Time ^{2,3}	--	33	--		
$T_{d(off)}$	Turn-Off Delay Time ^{2,3}	--	31	--		
T_f	Fall Time ^{2,3}	--	10	--	pF	$V_{DS}=-8V$, $V_{GS}=0V$, $f=1\text{MHz}$
C_{iss}	Input Capacitance	--	925	--		
C_{oss}	Output Capacitance	--	167	--		
C_{rss}	Reverse Transfer Capacitance	--	118	--		

Diode Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Units
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	--	--	-12	A
I_{sm}	Pulsed Source Current		--	--	-48	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_S=-2A$, $T_J=25^{\circ}\text{C}$	--	--	-1.1	V

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
3. Essentially independent of operating temperature.

Typical Performance Characteristics

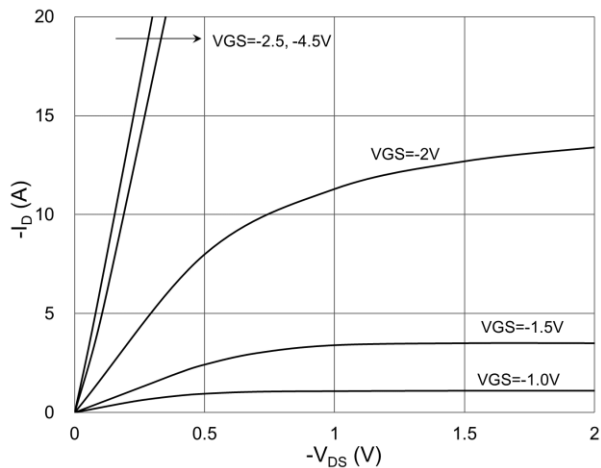
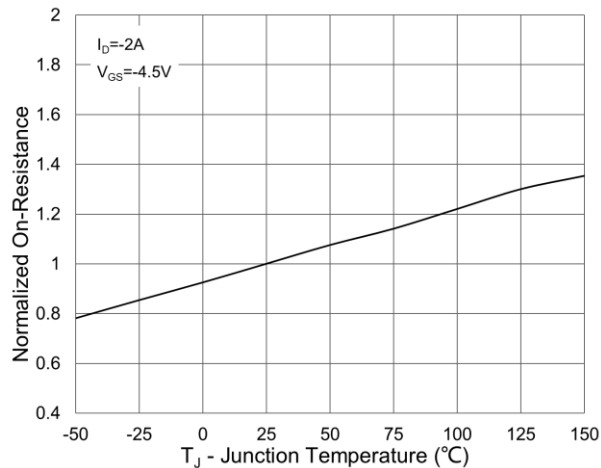
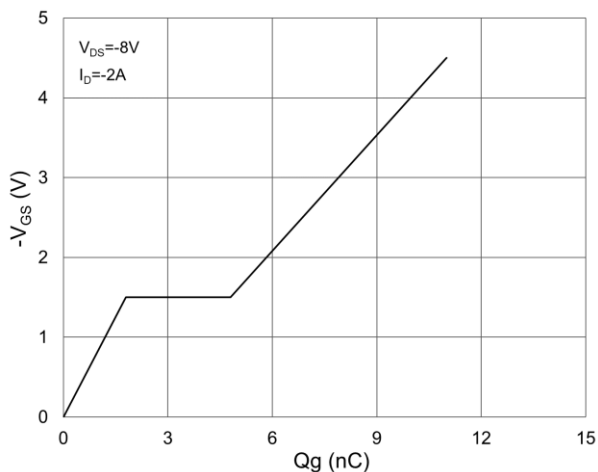
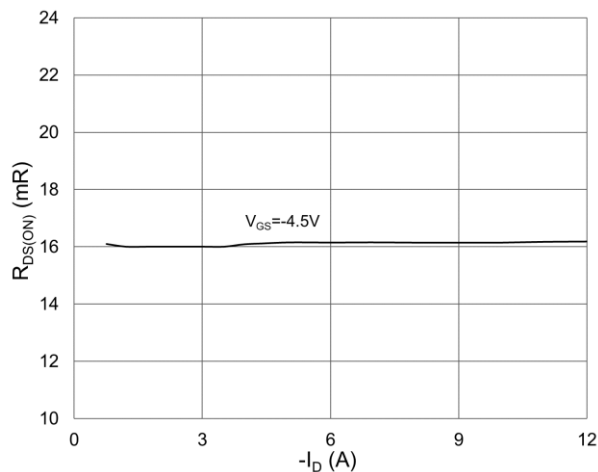
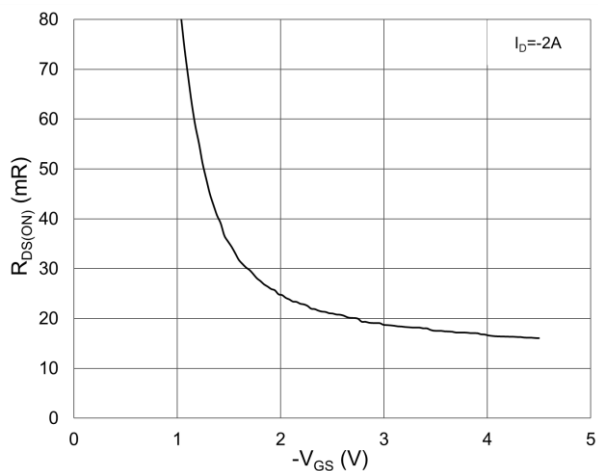
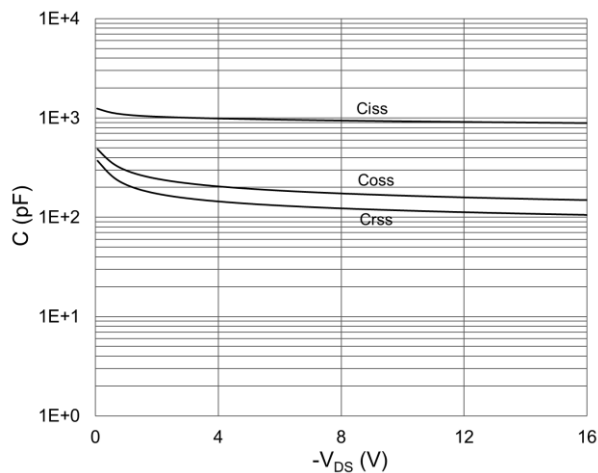
Fig1 Output Characteristics

Fig2 Normalized $R_{DS(on)}$ vs. T_J

Fig3 Gate Charge Waveform

Fig4 $R_{DS(on)}$ vs. Drain Current and Gate Voltage

Fig5 $R_{DS(on)}$ vs. Gate Voltage

Fig6 Capacitance Characteristics


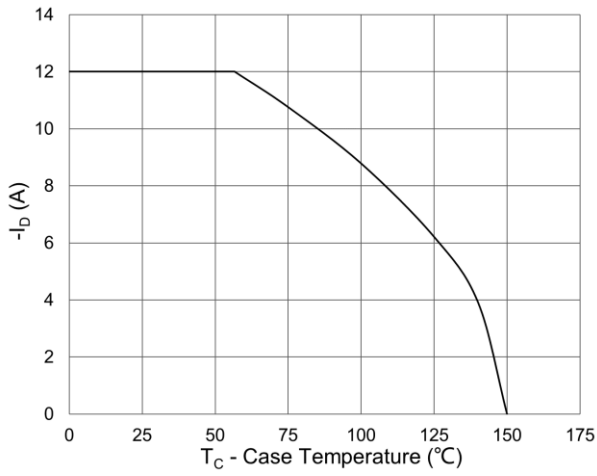
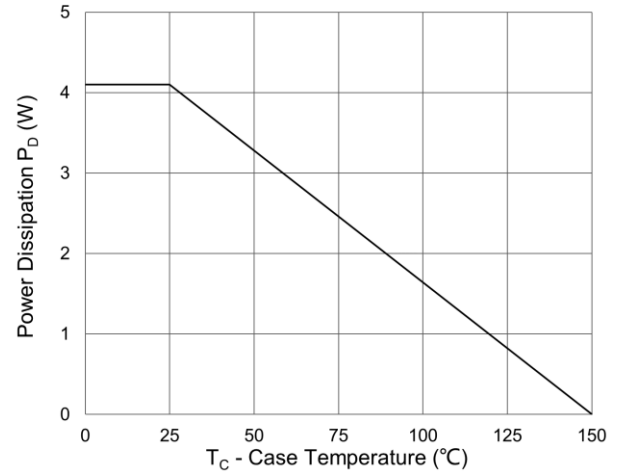
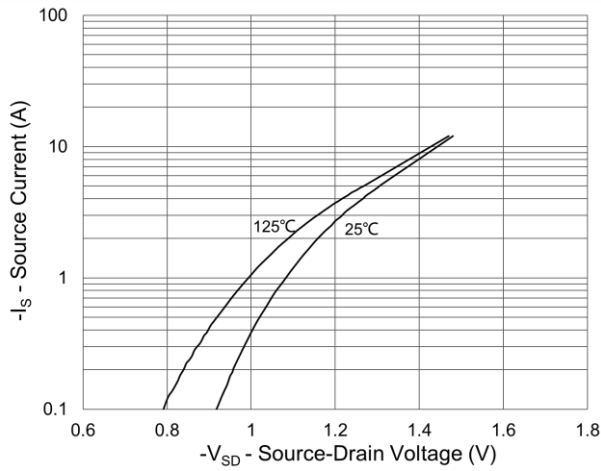
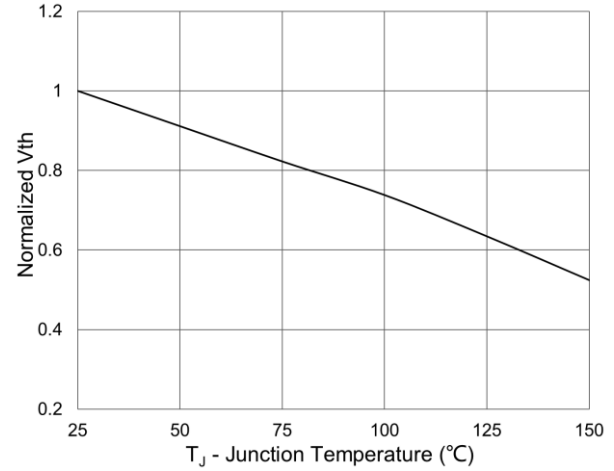
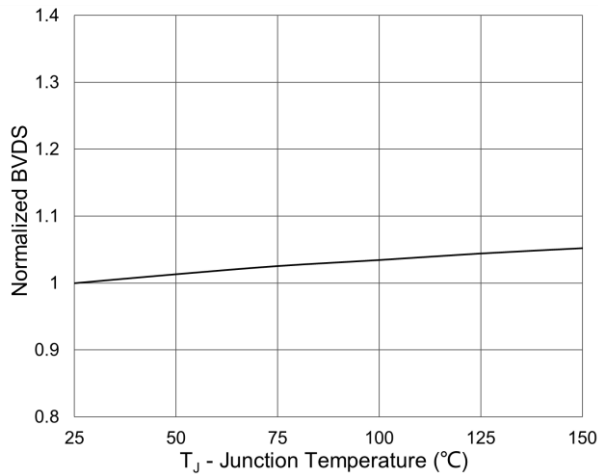
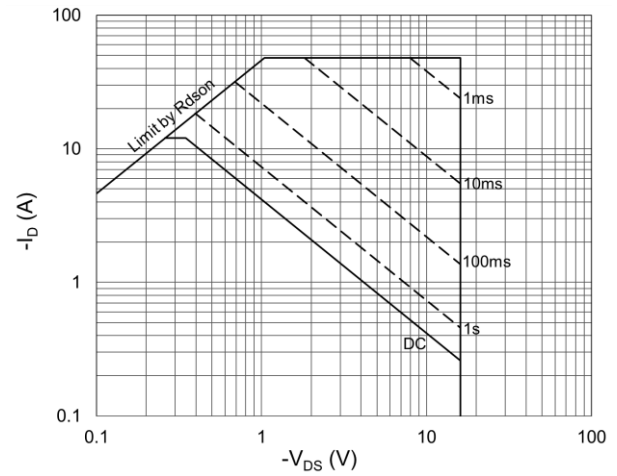
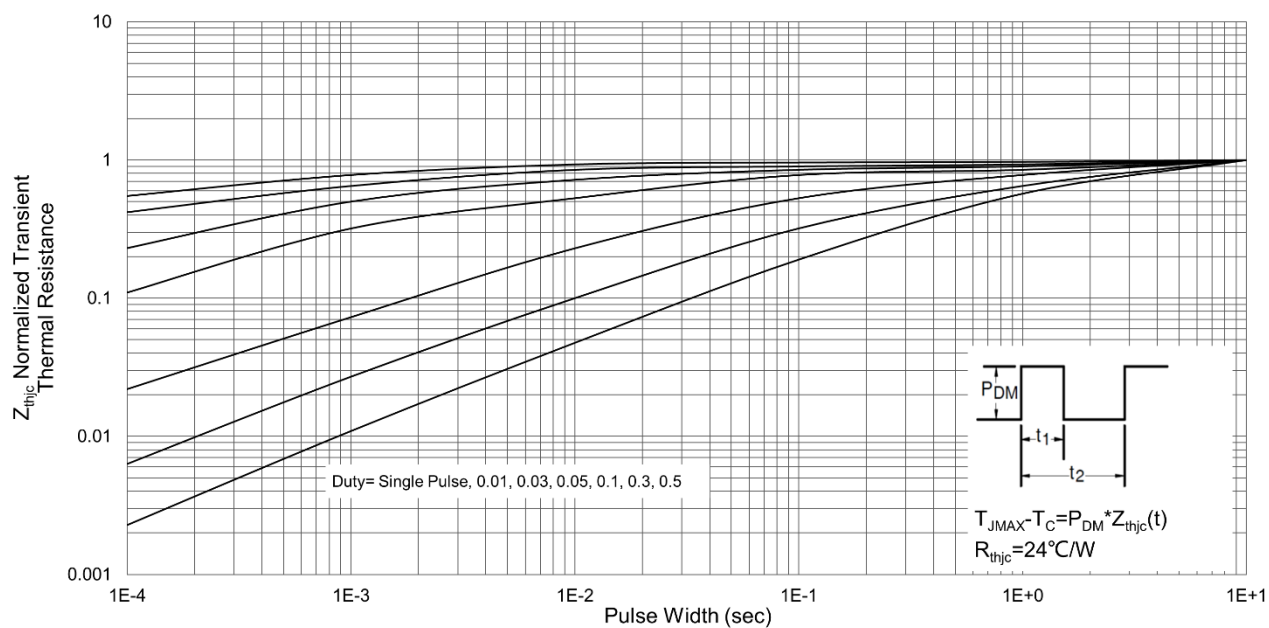
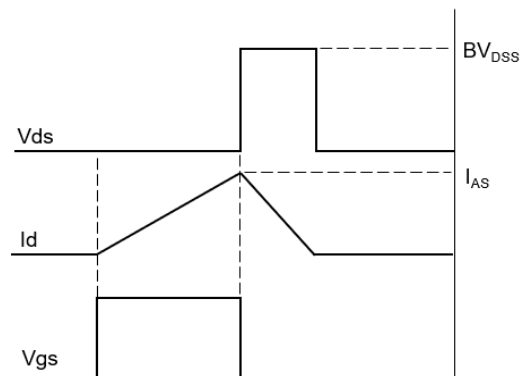
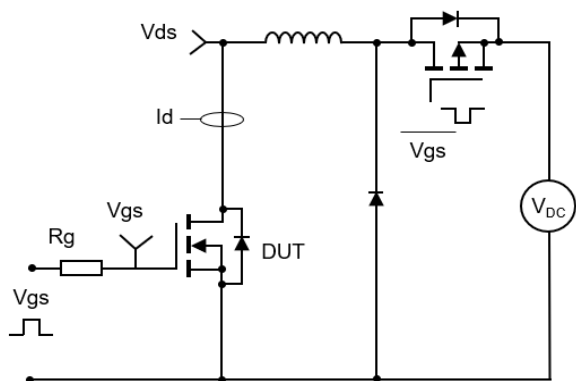
Fig7 Drain Current Derating

Fig8 Power Dissipation

Fig9 Source-Drain Diode Forward Characteristics

Fig10 Normalized Threshold Voltage vs. T_J

Fig11 Normalized Breakdown Voltage vs. T_J

Fig12 Maximum Safe Operation Area


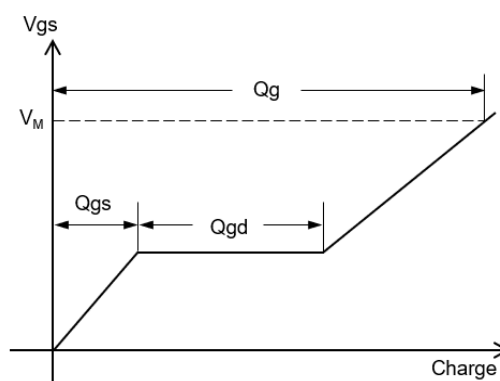
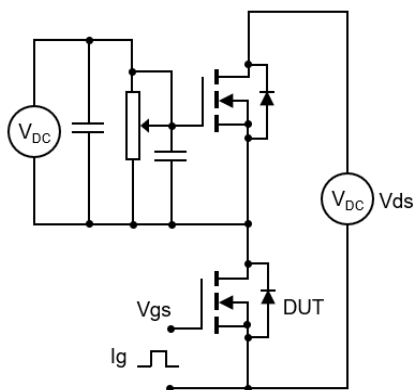
Fig13 Normalized Transient Impedance


Test Circuit & Waveform

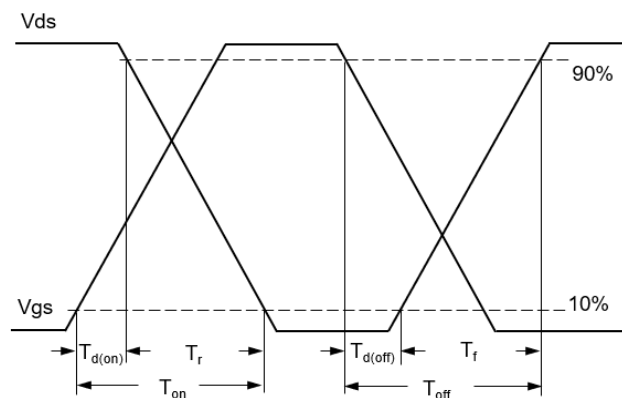
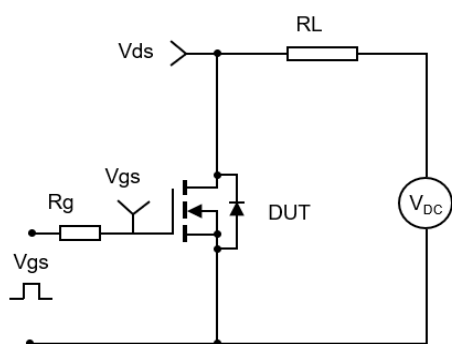
1. Unclamped Inductive Switching Test Circuit & Waveform



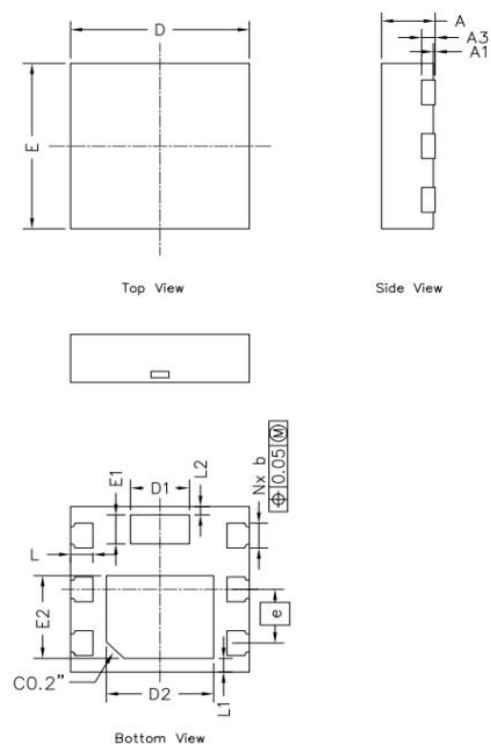
2. Gate Charge Test Circuit & Waveform



3. Resistive Switching Test Circuit & Waveform



DFN2020-6L Package Information



SYMBOLS	DIMENSION IN MM			DIMENSION IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.700	0.750	0.800	0.028	0.030	0.031
A1	---	---	0.050	----	----	0.002
A3	0.195	0.203	0.211	0.008	0.008	0.008
b	0.250	0.300	0.350	0.010	0.012	0.014
e	0.65BSC			0.026 BSC		
D	1.900	2.000	2.100	0.075	0.079	0.083
E	1.900	2.000	2.100	0.075	0.079	0.083
D1	0.560	0.660	0.760	0.022	0.026	0.030
E1	0.250	0.350	0.450	0.010	0.014	0.018
D2	1.100	1.200	1.300	0.043	0.047	0.051
E2	0.900	1.000	1.100	0.035	0.039	0.043
L	0.150	0.250	0.350	0.006	0.010	0.014
L1	0.065	0.165	0.265	0.003	0.006	0.010
L2	0.000	0.100	0.200	0.000	0.004	0.008