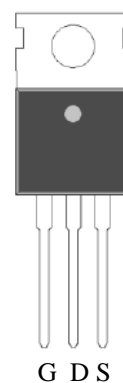


N-Channel Enhancement Mode Power MOSFET

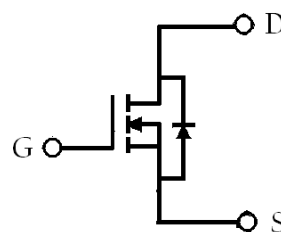
Features:

- Low On Resistance
- Simple Drive Requirement
- Low Gate Charge
- Fast Switching Characteristic
- RoHS compliant package

TO-220



BV_{DSS}	40V
I_D@V_{GS}=10V, T_C=25°C	132A
I_D@V_{GS}=10V, T_A=25°C	27A
R_{DS(ON)}@V_{GS}=10V, I_D=20A	1.8mΩ (typ)
R_{DS(ON)}@V_{GS}=4.5V, I_D=20A	2.8mΩ (typ)



G : Gate D : Drain S : Source

Ordering Information

Device	Package	Shipping
KEB1D6N04R	TO-220 (RoHS compliant)	50 pcs/tube, 20 tubes/box, 5 boxes / carton

Absolute Maximum Ratings (T_c=25°C)

Parameter	Symbol	Limits	Unit	
Drain-Source Voltage (Note 1)	V _{DS}	40	V	
Gate-Source Voltage	V _{GS}	±20		
Continuous Drain Current @T _c =25°C, V _{GS} =10V (Note 1)	I _D	132*	A	
Continuous Drain Current @T _c =100°C, V _{GS} =10V (Note 1)		84*		
Continuous Drain Current @T _A =25°C, V _{GS} =10V (Note 2)	I _{DSM}	27		
Continuous Drain Current @T _A =70°C, V _{GS} =10V (Note 2)		21.5		
Pulsed Drain Current	I _{DM}	528*		
Avalanche Current @ L=0.1mH	I _{AS}	35		
Avalanche Energy @ L=0.5mH	E _{AS}	132	mJ	
Power Dissipation	T _c =25°C (Note 1)	P _D	82	W
	T _c =100°C (Note 1)		32.8	
	T _A =25°C (Note 2)	P _{DSM}	3.4	
	T _A =70°C (Note 2)		2.2	
Maximum Temperature for Soldering @ Lead at 0.063 in(1.6mm)	T _L	300	°C	
Maximum Temperature for Soldering @ Package Body for 10	T _{PKG}	260		
Operating Junction and Storage Temperature	T _J , T _{stg}	-55~+150		

*Drain current limited by maximum junction temperature

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	R _{θJC}	1.52	°C/W
Thermal Resistance, Junction-to-ambient, max (Note 2)	R _{θJA}	37	

- Note : 1. The power dissipation P_D is based on T_{J(MAX)}=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
2. The value of R_{θJA} is measured with the device mounted on 1 in² FR-4 board with 2 oz. copper, in a still air environment with T_A=25°C. The power dissipation P_{DSM} is based on R_{θJA} and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
3. Pulse width limited by junction temperature T_{J(MAX)}=150°C. Ratings are based on low frequency and low duty cycles to keep initial T_J=25°C.

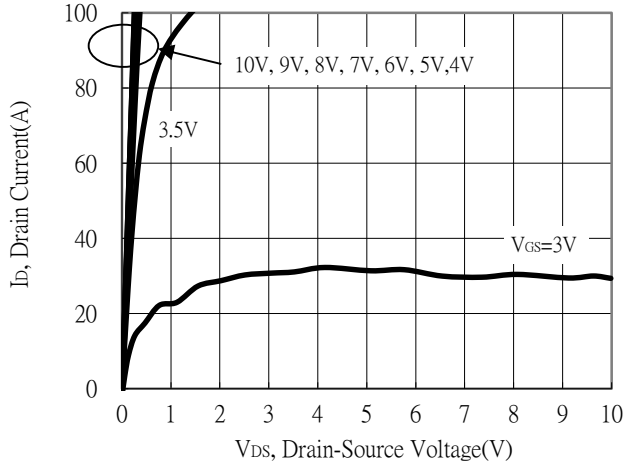
Characteristics (T_j=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	40	-	-	V	V _{GS} =0V, I _D =250μA
ΔBV _{DSS} /ΔT _j	-	50	-	mV/°C	Reference to 25°C, I _D =250μA
V _{GS(th)}	1	-	2.5	V	V _{DS} =V _{GS} , I _D =250μA
*G _{FS}	-	49.2	-	S	V _{DS} =5V, I _D =20A
I _{GSS}	-	-	±100	nA	V _{GS} =±20V, V _{DS} =0V
I _{DSS}	-	-	1	μA	V _{DS} =32V, V _{GS} =0V
	-	-	5		V _{DS} =32V, V _{GS} =0V, T _J =55°C
*R _{DS(ON)}	-	1.8	2.3	mΩ	V _{GS} =10V, I _D =20A
	-	2.8	3.9		V _{GS} =4.5V, I _D =20A
Dynamic					
*Q _g	-	31	-	nC	V _{DS} =20V, I _D =20A, V _{GS} =4.5V
*Q _{gs}	-	11	-		
*Q _{gd}	-	11	-		
*t _{d(ON)}	-	21	-	ns	V _{DD} =20V, I _D =20A, V _{GS} =10V, R _G =3Ω
*t _r	-	17	-		
*t _{d(OFF)}	-	63	-		
*t _f	-	12	-		
C _{iss}	-	3660	-	pF	V _{GS} =0V, V _{DS} =20V, f=1MHz
C _{oss}	-	1969	-		
C _{rss}	-	133	-		
R _g	-	0.62	-	Ω	f=1MHz
Source-Drain Diode					
*I _S	-	-	68	A	
*I _{SM}	-	-	272		
*V _{SD}	-	0.8	1.2	V	I _S =20A, V _{GS} =0V
*t _{rr}	-	48	-	ns	V _{GS} =0V, I _F =20A, dI _F /dt=100A/μs
*Q _{rr}	-	40	-	nC	

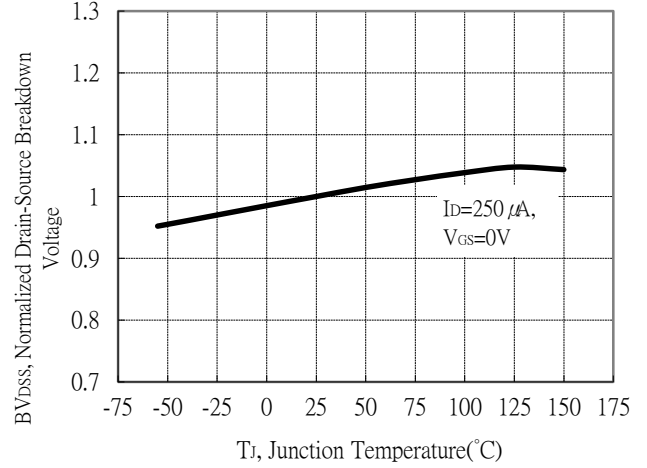
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

Typical Characteristics

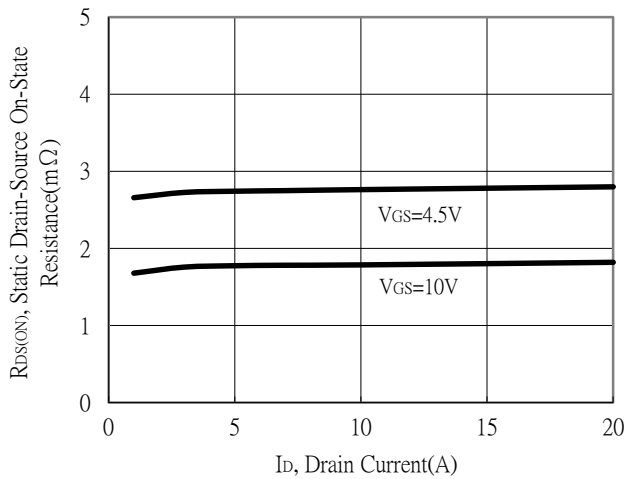
Typical Output Characteristics



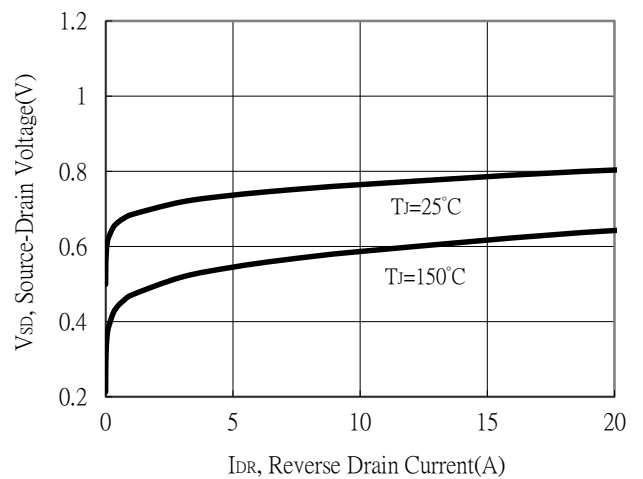
Brekdown Voltage vs Ambient Temperature



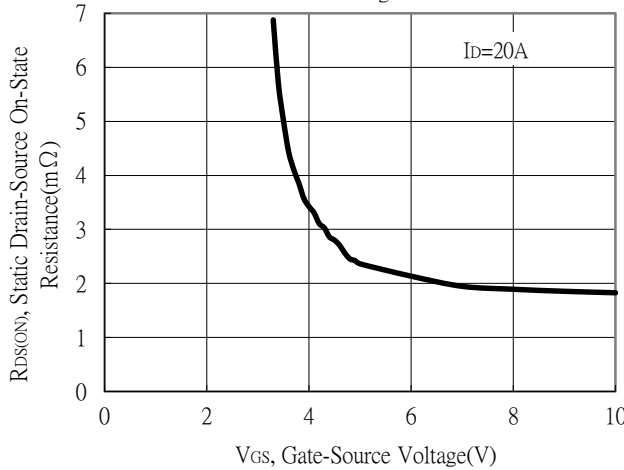
Static Drain-Source On-State resistance vs Drain Current



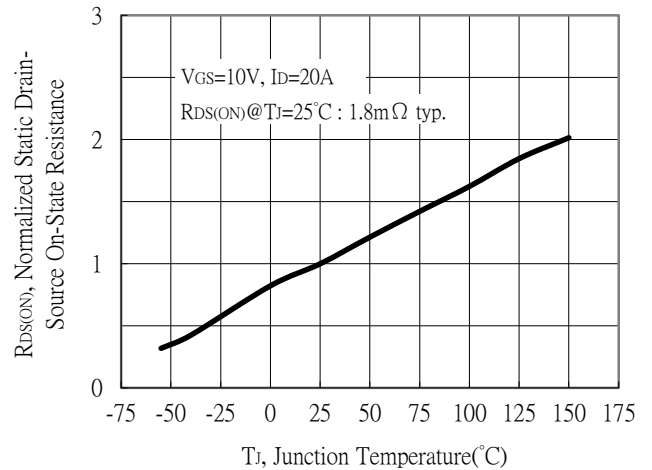
Reverse Drain Current vs Source-Drain Voltage



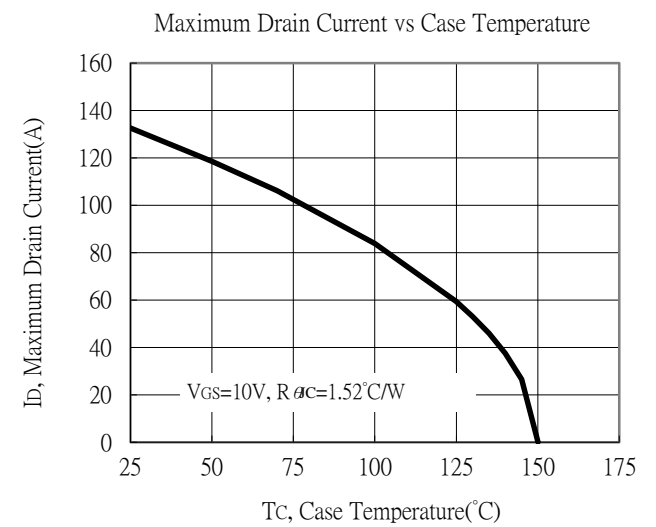
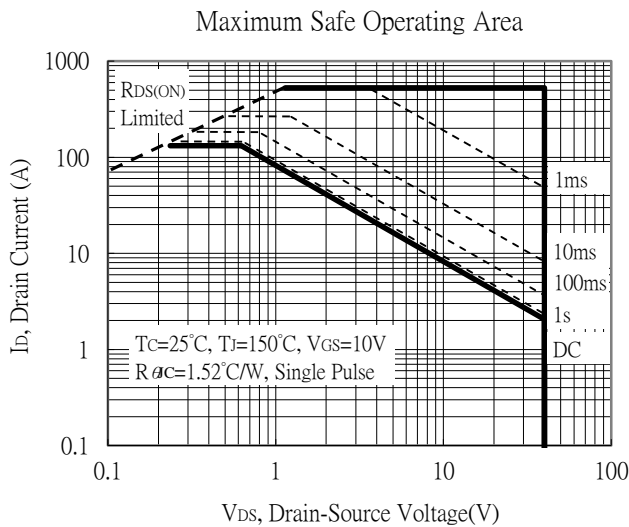
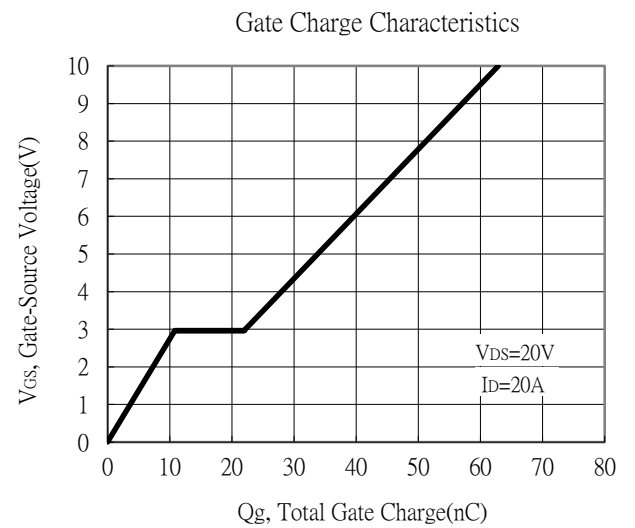
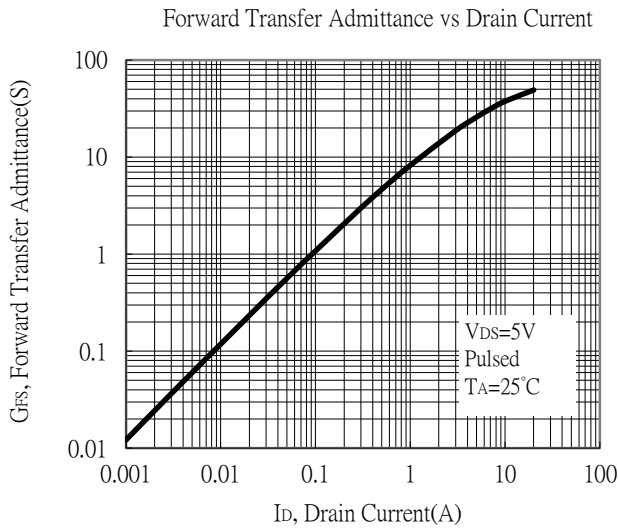
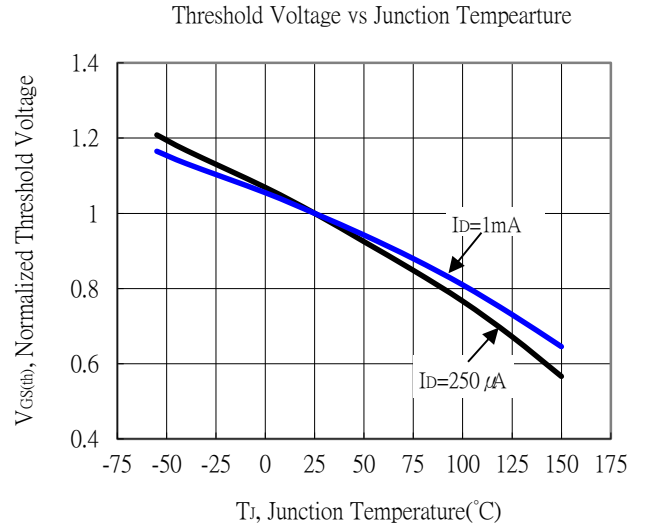
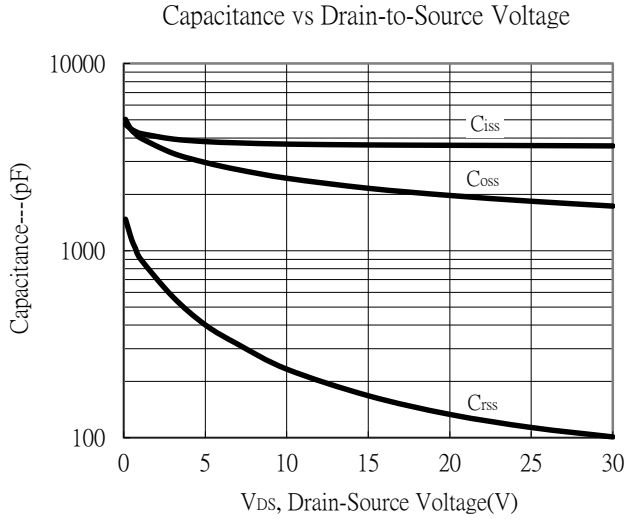
Static Drain-Source On-State Resistance vs Gate-Source Voltage



Drain-Source On-State Resistance vs Junction Temperature

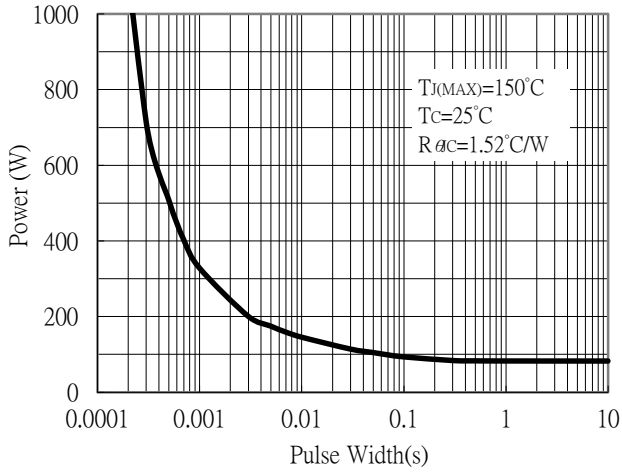


Typical Characteristics(Cont.)

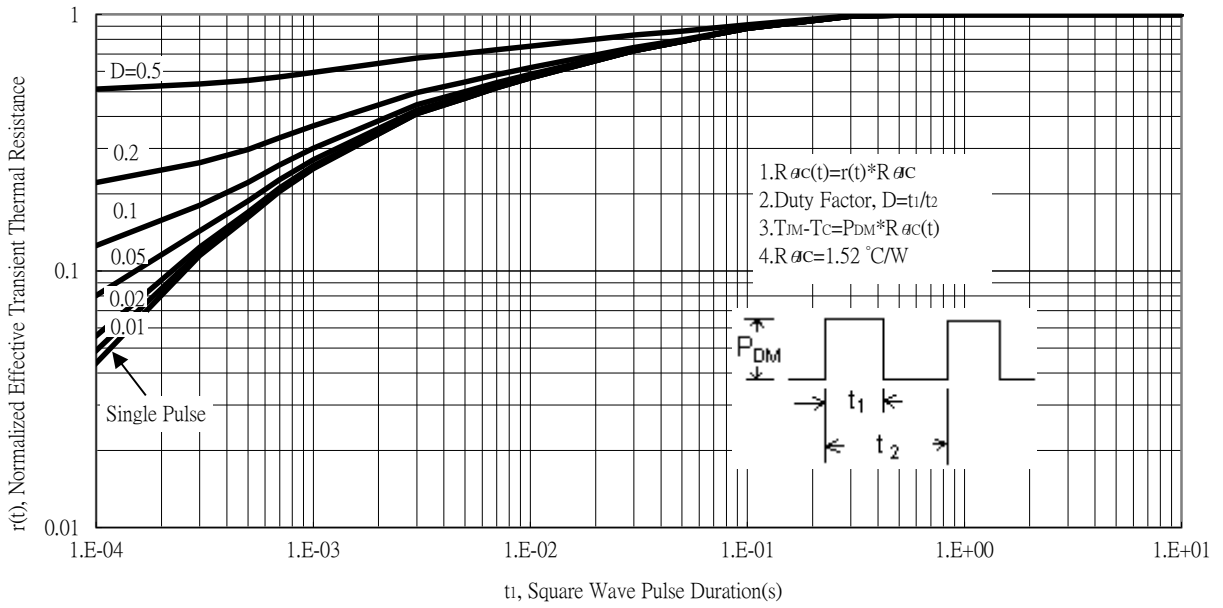


Typical Characteristics(Cont.)

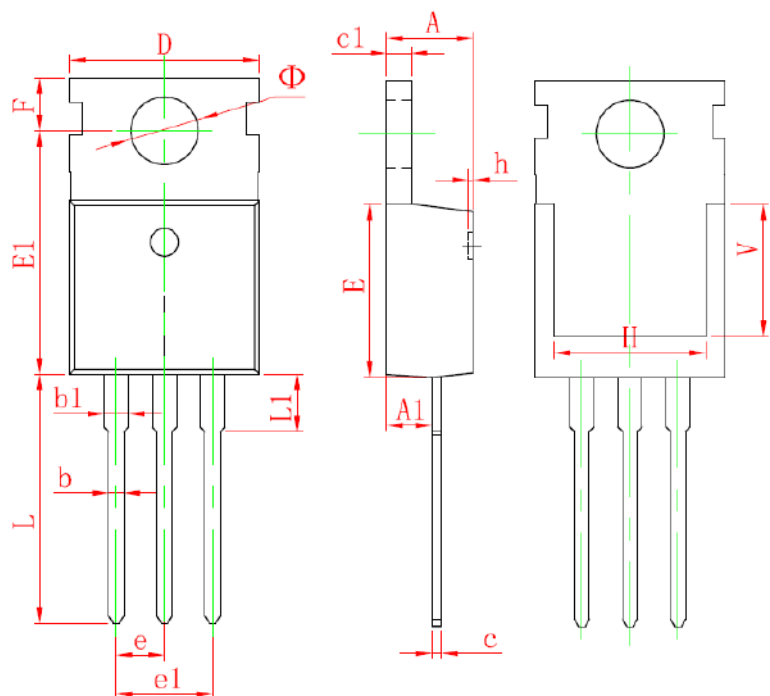
Single Pulse Maximum Power Dissipation



Transient Thermal Response Curves

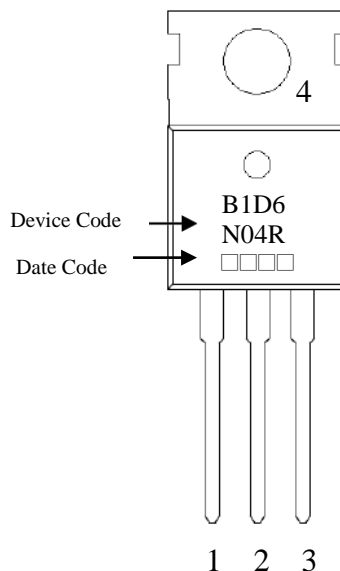


TO-220 Dimension



3-Lead TO-220 Plastic Package

Marking:



Style: Pin 1.Gate 2.Drain 3.Source
4.Drain

*: Typical

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181	e	2.540*		0.100*	
A1	2.250	2.550	0.089	0.100	e1	4.980	5.180	0.196	0.204
b	0.710	0.910	0.028	0.036	F	2.650	2.950	0.104	0.116
b1	1.170	1.370	0.046	0.054	H	7.900	8.100	0.311	0.319
c	0.330	0.650	0.013	0.026	h	0.000	0.300	0.000	0.012
c1	1.200	1.400	0.047	0.055	L	12.900	13.400	0.508	0.528
D	9.910	10.250	0.390	0.404	L1	2.850	3.250	0.112	0.128
E	8.950	9.750	0.352	0.384	V	7.500	REF	0.295	REF
E1	12.650	12.950	0.498	0.510	Φ	3.400	3.800	0.134	0.150