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[IDP12E120](#)

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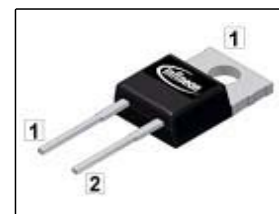
[sales@integrated-circuit.com](mailto:sales@integrated-circuit.com)


**IDP12E120**
**Fast Switching Diode**
**Features**

- 1200 V diode technology
- Fast recovery
- Soft switching
- Low reverse recovery charge
- Low forward voltage
- Easy paralleling
- Pb-free lead plating; RoHS compliant
- Halogen-free according to IEC61249-2-21
- Qualified according to JEDEC for target applications

**Product Summary**

$V_{RRM}$	1200	V
$I_F$	12	A
$V_F$	1.65	V
$T_{jmax}$	150	°C

**PG-TO220-2**


Type	Package	Ordering Code	Marking	Pin 1	PIN 2	PIN 3
IDP12E120	PG-TO220-2	-	D12E120	C	A	-

**Maximum Ratings, at  $T_j = 25\text{ °C}$ , unless otherwise specified**

Parameter	Symbol	Value	Unit
Repetitive peak reverse voltage	$V_{RRM}$	1200	V
Continuous forward current	$I_F$	28	A
$T_C=25\text{ °C}$		17	
$T_C=90\text{ °C}$			
Surge non repetitive forward current	$I_{FSM}$	63	
$T_C=25\text{ °C}$ , $t_p=10\text{ ms}$ , sine halfwave			
Maximum repetitive forward current	$I_{FRM}$	42.5	
$T_C=25\text{ °C}$ , $t_p$ limited by $T_{jmax}$ , $D=0.5$			
Power dissipation	$P_{tot}$	96	W
$T_C=25\text{ °C}$		46	
$T_C=90\text{ °C}$			
Operating and storage temperature	$T_j, T_{stg}$	-55...+150	°C
Soldering temperature	$T_S$	260	°C
wavesoldering, 1.6mm (0.063 in.) from case for 10s			


**IDP12E120**
**Thermal Characteristics**

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>Characteristics</b>					
Thermal resistance, junction - case	$R_{thJC}$	-	-	1.3	K/W
Thermal resistance, junction - ambient, leaded	$R_{thJA}$	-	-	62	
SMD version, device on PCB: @ min. footprint @ 6 cm <sup>2</sup> cooling area <sup>1)</sup>	$R_{thJA}$	-	-	62	
		-	35	-	

**Electrical Characteristics, at  $T_j = 25\text{ }^\circ\text{C}$ , unless otherwise specified**

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>Static Characteristics</b>					
Reverse leakage current $V_R=1200\text{V}$ , $T_j=25\text{ }^\circ\text{C}$ $V_R=1200\text{V}$ , $T_j=150\text{ }^\circ\text{C}$	$I_R$	-	-	100 1000	$\mu\text{A}$
Forward voltage drop $I_F=12\text{A}$ , $T_j=25\text{ }^\circ\text{C}$ $I_F=12\text{A}$ , $T_j=150\text{ }^\circ\text{C}$	$V_F$	-	1.65 1.7	2.15 -	V

<sup>0</sup>J-STD20 and JESD22

<sup>1</sup>Device on 40mm\*40mm\*1.5mm epoxy PCB FR4 with 6cm<sup>2</sup> (one layer, 70  $\mu\text{m}$  thick) copper area for drain connection. PCB is vertical without blown air.


**IDP12E120**
**Electrical Characteristics, at  $T_j = 25\text{ }^\circ\text{C}$ , unless otherwise specified**

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>Dynamic Characteristics</b>					
Reverse recovery time	$t_{rr}$				ns
$V_R=800\text{V}, I_F=12\text{A}, di_F/dt=800\text{A}/\mu\text{s}, T_j=25^\circ\text{C}$		-	150	-	
$V_R=800\text{V}, I_F=12\text{A}, di_F/dt=800\text{A}/\mu\text{s}, T_j=125^\circ\text{C}$		-	215	-	
$V_R=800\text{V}, I_F=12\text{A}, di_F/dt=800\text{A}/\mu\text{s}, T_j=150^\circ\text{C}$		-	225	-	
Peak reverse current	$I_{rrm}$				A
$V_R=800\text{V}, I_F = 12\text{A}, di_F/dt=800\text{A}/\mu\text{s}, T_j=25^\circ\text{C}$		-	17	-	
$V_R=800\text{V}, I_F = 12\text{A}, di_F/dt=800\text{A}/\mu\text{s}, T_j=125^\circ\text{C}$		-	20.9	-	
$V_R=800\text{V}, I_F = 12\text{A}, di_F/dt=800\text{A}/\mu\text{s}, T_j=150^\circ\text{C}$		-	21.5	-	
Reverse recovery charge	$Q_{rr}$				nC
$V_R=800\text{V}, I_F=12\text{A}, di_F/dt=800\text{A}/\mu\text{s}, T_j=25^\circ\text{C}$		-	1200	-	
$V_R=800\text{V}, I_F = 12\text{A}, di_F/dt=800\text{A}/\mu\text{s}, T_j=125^\circ\text{C}$		-	1840	-	
$V_R=800\text{V}, I_F = 12\text{A}, di_F/dt=800\text{A}/\mu\text{s}, T_j=150^\circ\text{C}$		-	2025	-	
Reverse recovery softness factor	S				
$V_R=800\text{V}, I_F=12\text{A}, di_F/dt=800\text{A}/\mu\text{s}, T_j=25^\circ\text{C}$		-	5	-	
$V_R=800\text{V}, I_F=12\text{A}, di_F/dt=800\text{A}/\mu\text{s}, T_j=125^\circ\text{C}$		-	5.8	-	
$V_R=800\text{V}, I_F=12\text{A}, di_F/dt=800\text{A}/\mu\text{s}, T_j=150^\circ\text{C}$		-	5.9	-	

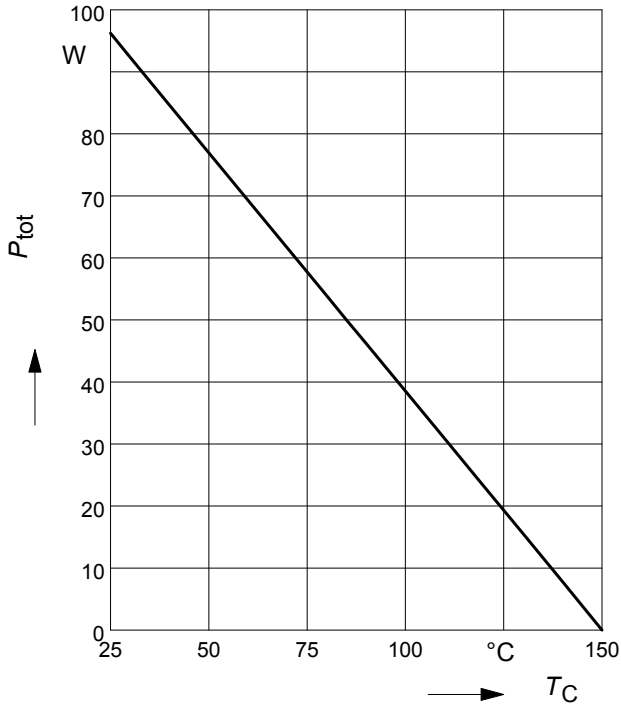


**IDP12E120**

**1 Power dissipation**

$P_{tot} = f(T_C)$

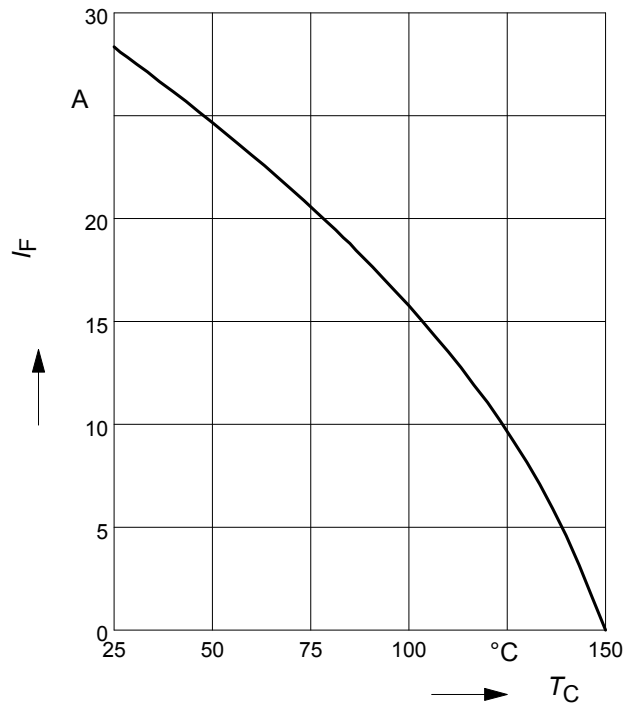
parameter:  $T_j \leq 150^\circ\text{C}$



**2 Diode forward current**

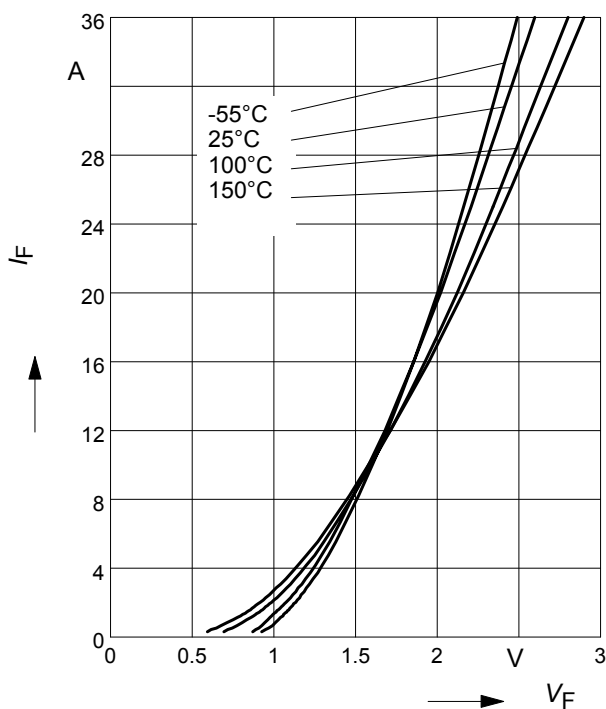
$I_F = f(T_C)$

parameter:  $T_j \leq 150^\circ\text{C}$



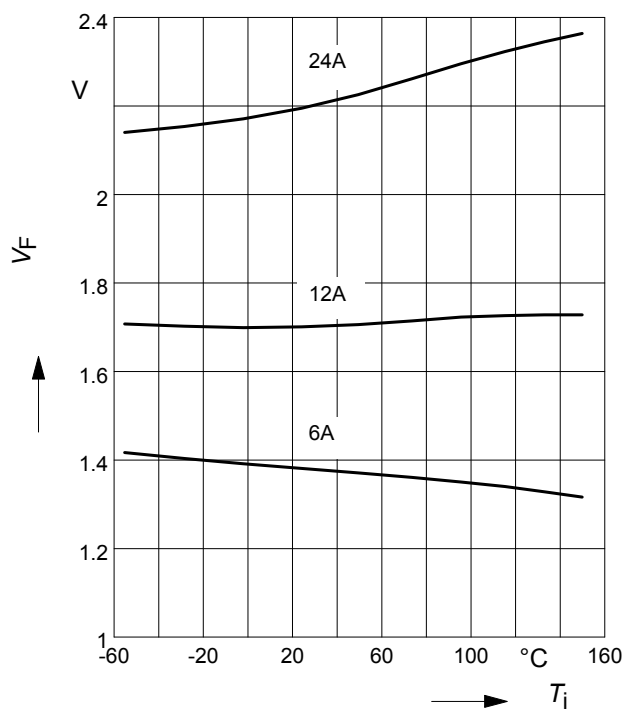
**3 Typ. diode forward current**

$I_F = f(V_F)$



**4 Typ. diode forward voltage**

$V_F = f(T_j)$

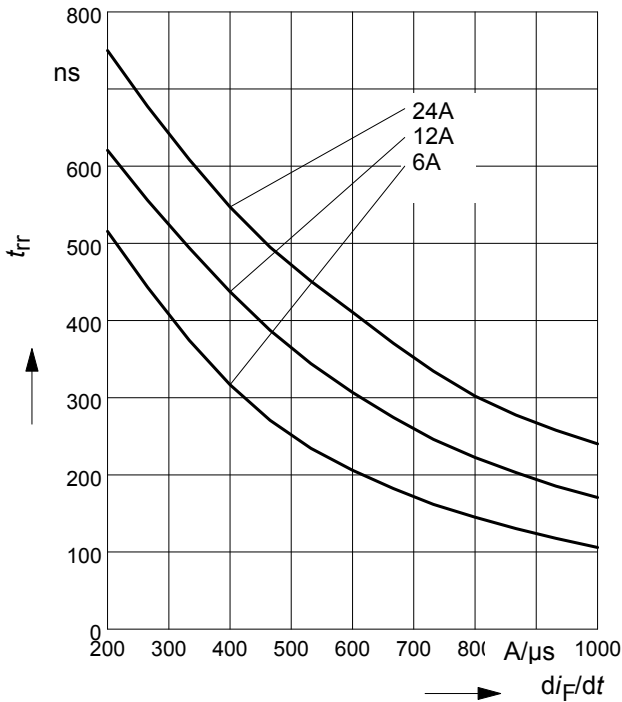




**5 Typ. reverse recovery time**

$t_{rr} = f(di_F/dt)$

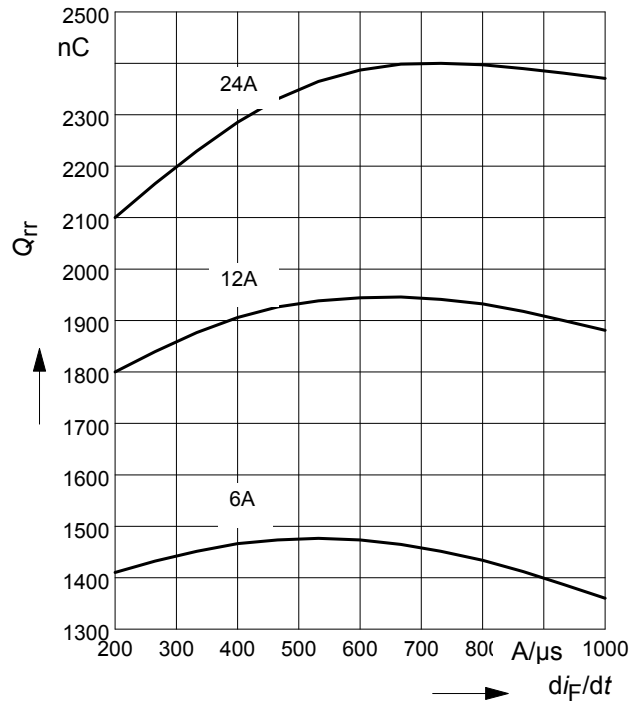
parameter:  $V_R = 800V, T_j = 125^\circ C$



**6 Typ. reverse recovery charge**

$Q_{rr} = f(di_F/dt)$

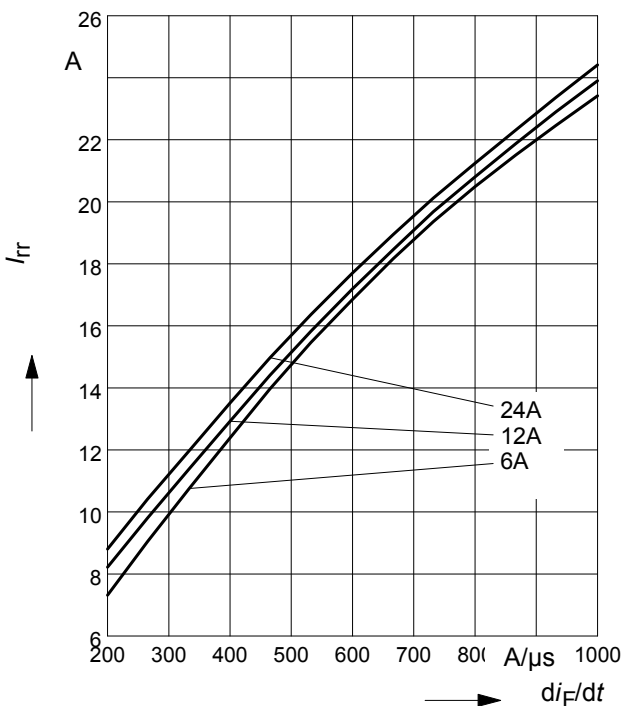
parameter:  $V_R = 800V, T_j = 125^\circ C$



**7 Typ. reverse recovery current**

$I_{rr} = f(di_F/dt)$

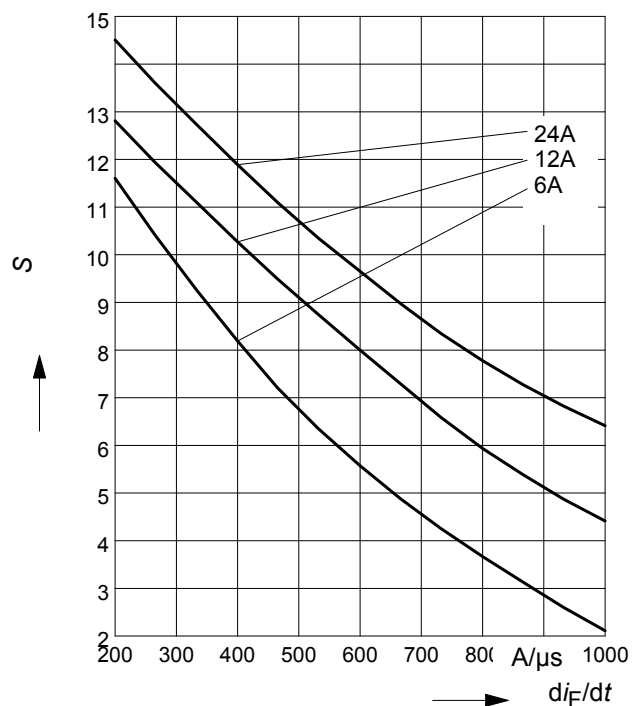
parameter:  $V_R = 800V, T_j = 125^\circ C$



**8 Typ. reverse recovery softness factor**

$S = f(di_F/dt)$

parameter:  $V_R = 800V, T_j = 125^\circ C$



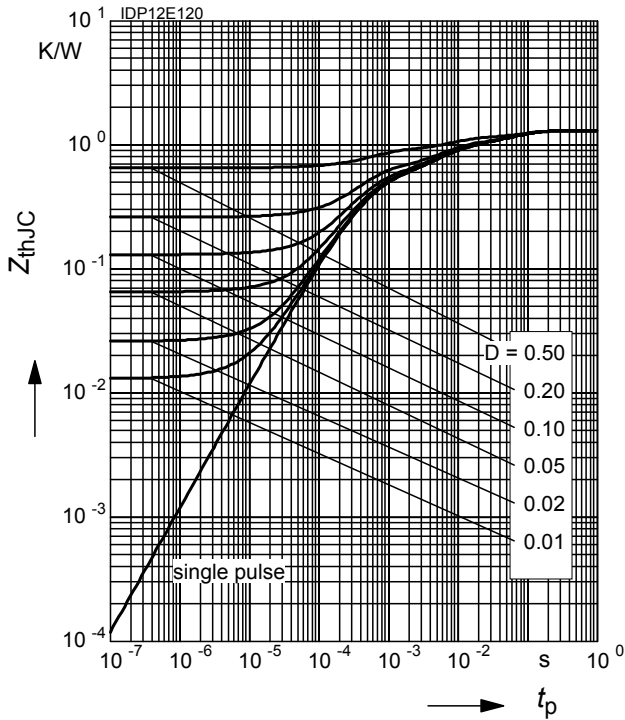


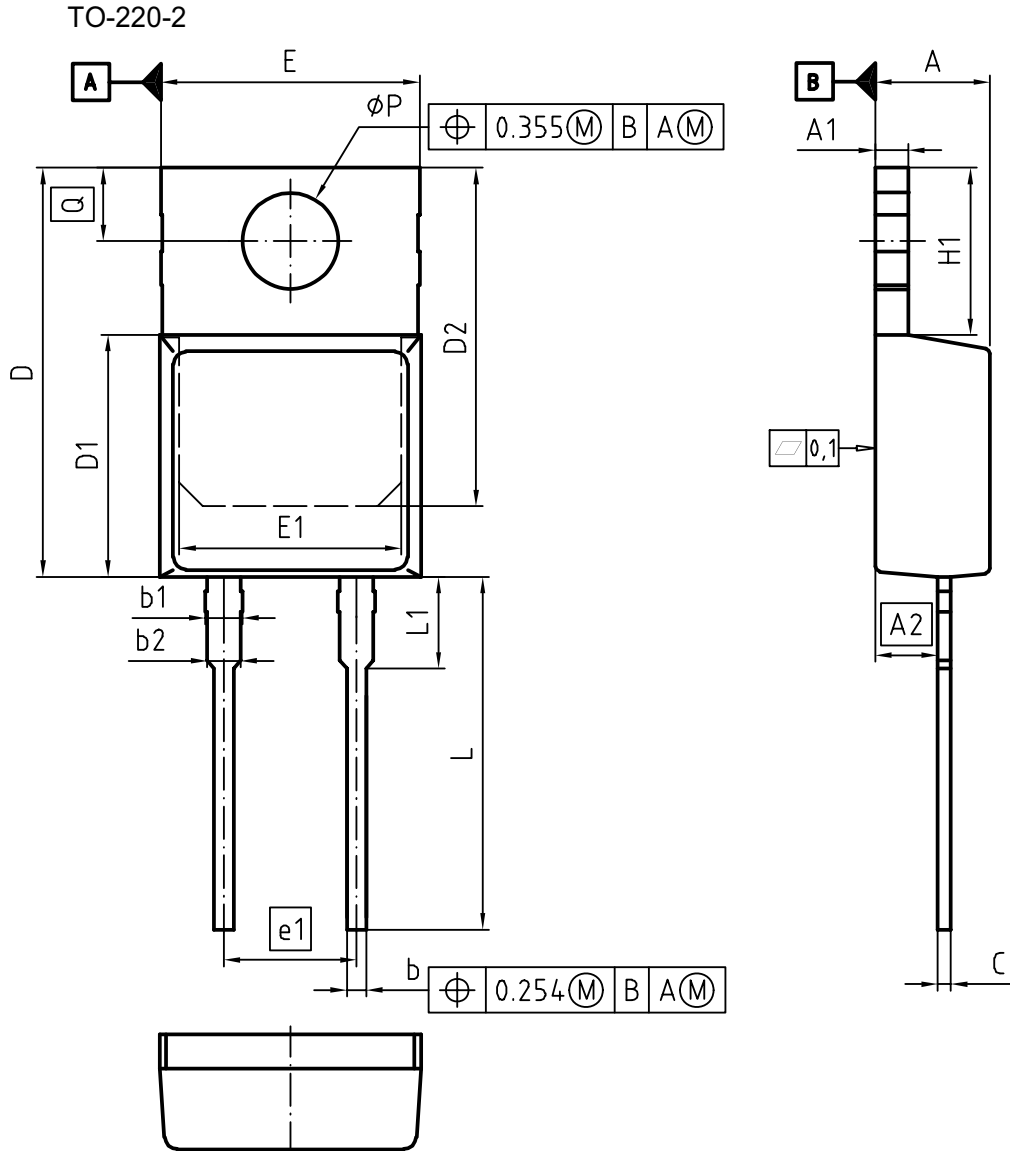
**IDP12E120**

**9 Max. transient thermal impedance**

$Z_{thJC} = f(t_p)$

parameter :  $D = t_p/T$





DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.30	4.50	0.169	0.177
A1	1.17	1.37	0.046	0.054
A2	2.30	2.50	0.091	0.098
b	0.65	0.85	0.026	0.033
b1	1.19	1.69	0.047	0.066
b2	1.19	1.39	0.047	0.055
c	0.40	0.60	0.016	0.024
D	15.35	15.95	0.604	0.628
D1	9.05	9.45	0.356	0.372
D2	12.30	13.05	0.484	0.514
E	9.80	10.20	0.386	0.402
E1	7.25	8.60	0.285	0.339
e1	5.08		0.200	
N	2		2	
H1	5.90	6.90	0.232	0.272
L	13.00	14.00	0.512	0.551
L1	3.30	3.70	0.130	0.146
phi P	3.55	3.70	0.140	0.146
Q	2.60	3.00	0.102	0.118

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