EPCOS

# *SAW Components*

*Data Sheet B4140*

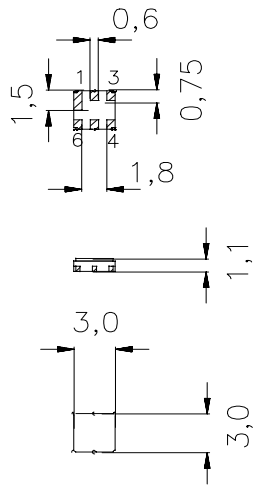
Ceramic package **DCC6D**

### Features

- Low-loss RF filter for mobile telephone EGSM systems, transmit path
- Low amplitude ripple
- Usable passband 35 MHz
- Balanced to unbalanced Operation
- Impedance transformation from 200 Ω to 50 Ω
- Ceramic package for **S**urface **M**ounted **T**echnology (**SMT**)

### Terminals

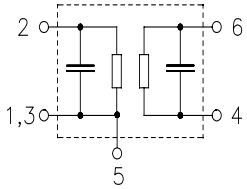
- Ni, gold-plated




Dimensions in mm, approx. weight 0,037 g

### Pin configuration

| | |
|---|---|
| 4, 6 | Input, balanced |
| 5 | To be grounded |
| 2 | Output, unbalanced |
| 1, 3 | Output ground |
| 1, 3, 5 | Case ground |




| Type | Ordering code | Marking and Package according to | Packing according to |
|---|---|---|---|
| B4140 | B39901-B4140-U510 | C61157-A7-A68 | F61074-V8089-Z000 |

**E**lectrostatic **S**ensitive **D**evice (**ESD**)

### Maximum ratings

| | | | | |
|---|---|---|---|---|
| Operable temperature range | $T$ | – 25/ + 80 | ˚C | |
| Storage temperature range | $T_{stg}$ | – 40 / + 85 | ˚C | |
| DC voltage | $V_{DC}$ | 0 | V | |
| Input power max. | | | | source impedance 50 Ω, load impedance 200 Ω, peak power of GSM signal, |
| 880 ... 915 MHz | $P_{IN}$ | 8,5 | dBm | duty cycle 2 : 8 |
| | | 10,0 | dBm | duty cycle 1: 8 |

## Characteristics

Operating temperature range: $T$ = 25+-2 ˚C
Terminating source impedance: $Z_S$ = 50 Ω
Terminating load impedance: $Z_L$ = 200 Ω || 56 nH
( L simulated with Q factor 20 )

| | | | min. | typ. | max. | |
|---|---|---|---|---|---|---|
| **Center frequency** | $f_C$ | | — | 897,5 | — | MHz |
| **Maximum insertion attenuation** | $\alpha_{max}$ | | | | | |
| 880,0 ... 915,0 MHz | | | — | 2,8 | 3,4 | dB |
| **Amplitude ripple** (p-p) | $\Delta\alpha$ | | | | | |
| 880,0 ... 915,0 MHz | | | — | 1,2 | 1,5 | dB |
| **Input VSWR** | | | | | | |
| 880,0 ... 915,0 MHz | | | — | 1,7 | 2,0 | |
| **Output VSWR** | | | | | | |
| 880,0 ... 915,0 MHz | | | — | 1,6 | 2,0 | |
| **Attenuation** | $\alpha$ | | | | | |
| 0,0 ... 600,0 MHz | | | 60 | 77 | — | dB |
| 600,0 ... 800,0 MHz | | | 50 | 72 | — | dB |
| 800,0 ... 860,0 MHz | | | 40 | 44 | — | dB |
| 925,0 ... 935,0 MHz | | | 9 | 14 | — | dB |
| 935,0 ... 960,0 MHz | | | 25 | 27 | — | dB |
| 960,0 ...1000,0 MHz | | | 25 | 40 | — | dB |
| 1000,0 ...1050,0 MHz | | | 40 | 64 | — | dB |
| 1050,0 ...1500,0 MHz | | | 55 | 68 | — | dB |
| 1500,0 ...2000,0 MHz | | | 50 | 70 | — | dB |
| 2000,0 ...3000,0 MHz | | | 30 | 44 | — | dB |
| 3000,0 ...5000,0 MHz | | | 18 | 29 | — | dB |
| 5000,0 ...6000,0 MHz | | | 10 | 28 | — | dB |
| **Symmetry in band** (referenced to the matched operating condition) | | | | | | |
| $\lvert S_{31}\rvert/\lvert S_{21}\rvert$ 880,0 ... 915,0 MHz | | | -1,0 | 0 | 1,0 | dB |
| $\arg(S_{31}/S_{21})$ 880,0 ... 915,0 MHz | | | 170 | 180 | 190 | ° |

## Characteristics

Operating temperature range: $T$ = +20 to +40 °C
Terminating source impedance: $Z_S$ = 50 Ω
Terminating load impedance: $Z_L$ = 200 Ω || 56 nH
( L simulated with Q factor 20 )

| | | | min. | typ. | max. | |
|---|---|---|---|---|---|---|
| **Center frequency** | | $f_C$ | — | 897,5 | — | MHz |
| **Maximum insertion attenuation** | | $\alpha_{max}$ | | | | |
| | 880,0 ... 915,0 MHz | | — | 2,9 | 3,6 | dB |
| **Amplitude ripple** (p-p) | | $\Delta\alpha$ | | | | |
| | 880,0 ... 915,0 MHz | | — | 1,3 | 1,7 | dB |
| **Input VSWR** | | | | | | |
| | 880,0 ... 915,0 MHz | | — | 1,7 | 2,0 | |
| **Output VSWR** | | | | | | |
| | 880,0 ... 915,0 MHz | | — | 1,6 | 2,0 | |
| **Attenuation** | | $\alpha$ | | | | |
| | 0,0 ... 600,0 MHz | | 60 | 77 | — | dB |
| | 600,0 ... 800,0 MHz | | 50 | 72 | — | dB |
| | 800,0 ... 860,0 MHz | | 40 | 44 | — | dB |
| | 925,0 ... 935,0 MHz | | 9 | 13 | — | dB |
| | 935,0 ... 960,0 MHz | | 25 | 27 | — | dB |
| | 960,0 ...1000,0 MHz | | 25 | 40 | — | dB |
| | 1000,0 ...1050,0 MHz | | 40 | 64 | — | dB |
| | 1050,0 ...1500,0 MHz | | 55 | 68 | — | dB |
| | 1500,0 ...2000,0 MHz | | 50 | 70 | — | dB |
| | 2000,0 ...3000,0 MHz | | 30 | 44 | — | dB |
| | 3000,0 ...5000,0 MHz | | 18 | 29 | — | dB |
| | 5000,0 ...6000,0 MHz | | 10 | 28 | — | dB |
| **Symmetry in band** (referenced to the matched operating condition) | | | | | | |
| $\lvert S_{31}\rvert/\lvert S_{21}\rvert$ | 880,0 ... 915,0 MHz | | -1,0 | 0 | 1,0 | dB |
| $\arg(S_{31}/S_{21})$ | 880,0 ... 915,0 MHz | | 170 | 180 | 190 | ° |

## Characteristics

Operating temperature range: $T$ = +10 to +60 °C
Terminating source impedance: $Z_S$ = 50 Ω
Terminating load impedance: $Z_L$ = 200 Ω || 56 nH
( L simulated with Q factor 20 )

| | | min. | typ. | max. | |
|---|---|---|---|---|---|
| **Center frequency** | $f_C$ | — | 897,5 | — | MHz |
| **Maximum insertion attenuation** | $\alpha_{max}$ | | | | |
| 880,0 ... 915,0 MHz | | — | 2,9 | 3,8 | dB |
| **Amplitude ripple** (p-p) | $\Delta\alpha$ | | | | |
| 880,0 ... 915,0 MHz | | — | 1,3 | 1,9 | dB |
| **Input VSWR** | | | | | |
| 880,0 ... 915,0 MHz | | — | 1,7 | 2,0 | |
| **Output VSWR** | | | | | |
| 880,0 ... 915,0 MHz | | — | 1,6 | 2,0 | |
| **Attenuation** | $\alpha$ | | | | |
| 0,0 ... 600,0 MHz | | 60 | 77 | — | dB |
| 600,0 ... 800,0 MHz | | 50 | 72 | — | dB |
| 800,0 ... 860,0 MHz | | 40 | 44 | — | dB |
| 925,0 ... 935,0 MHz | | 8 | 12 | — | dB |
| 935,0 ... 960,0 MHz | | 24 | 27 | — | dB |
| 960,0 ...1000,0 MHz | | 25 | 40 | — | dB |
| 1000,0 ...1050,0 MHz | | 40 | 64 | — | dB |
| 1050,0 ...1500,0 MHz | | 55 | 68 | — | dB |
| 1500,0 ...2000,0 MHz | | 50 | 70 | — | dB |
| 2000,0 ...3000,0 MHz | | 30 | 44 | — | dB |
| 3000,0 ...5000,0 MHz | | 18 | 29 | — | dB |
| 5000,0 ...6000,0 MHz | | 10 | 28 | — | dB |
| **Symmetry in band** (referenced to the matched operating condition) | | | | | |
| $\lvert S_{31}\rvert/\lvert S_{21}\rvert$ 880,0 ... 915,0 MHz | | -1,0 | 0 | 1,0 | dB |
| $\arg(S_{31}/S_{21})$ 880,0 ... 915,0 MHz | | 170 | 180 | 190 | ° |

## Characteristics

Operating temperature range: $T$ = -10 to +80 °C
Terminating source impedance: $Z_S$ = 50 Ω
Terminating load impedance: $Z_L$ = 200 Ω || 56 nH
( L simulated with Q factor 20 )

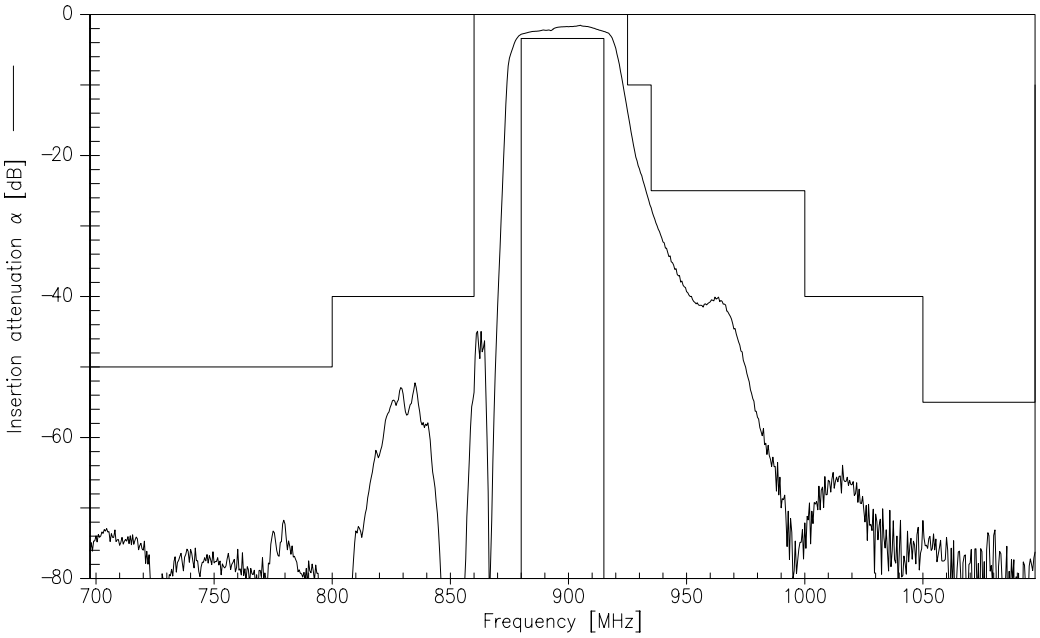
| | | | min. | typ. | max. | |
|---|---|---|---|---|---|---|
| **Center frequency** | | $f_C$ | — | 897,5 | — | MHz |
| **Maximum insertion attenuation** | | $\alpha_{max}$ | | | | |
| | 880,0 ... 915,0 MHz | | — | 3,2 | 4,2 | dB |
| **Amplitude ripple** (p-p) | | $\Delta\alpha$ | | | | |
| | 880,0 ... 915,0 MHz | | — | 1,6 | 2,3 | dB |
| **Input VSWR** | | | | | | |
| | 880,0 ... 915,0 MHz | | — | 1,7 | 2,2 | |
| **Output VSWR** | | | | | | |
| | 880,0 ... 915,0 MHz | | — | 1,6 | 2,2 | |
| **Attenuation** | | $\alpha$ | | | | |
| | 0,0 ... 600,0 MHz | | 60 | 77 | — | dB |
| | 600,0 ... 800,0 MHz | | 50 | 72 | — | dB |
| | 800,0 ... 860,0 MHz | | 35 | 44 | — | dB |
| | 925,0 ... 935,0 MHz | | 7 | 11 | — | dB |
| | 935,0 ... 960,0 MHz | | 23 | 26 | — | dB |
| | 960,0 ...1000,0 MHz | | 25 | 40 | — | dB |
| | 1000,0 ...1050,0 MHz | | 40 | 64 | — | dB |
| | 1050,0 ...1500,0 MHz | | 55 | 68 | — | dB |
| | 1500,0 ...2000,0 MHz | | 50 | 70 | — | dB |
| | 2000,0 ...3000,0 MHz | | 30 | 44 | — | dB |
| | 3000,0 ...5000,0 MHz | | 18 | 29 | — | dB |
| | 5000,0 ...6000,0 MHz | | 10 | 28 | — | dB |
| **Symmetry in band** (referenced to the matched operating condition) | | | | | | |
| $\lvert S_{31}\rvert/\lvert S_{21}\rvert$ | 880,0 ... 915,0 MHz | | -1,0 | 0 | 1,0 | dB |
| $\arg(S_{31}/S_{21})$ | 880,0 ... 915,0 MHz | | 170 | 180 | 190 | ° |

## Characteristics

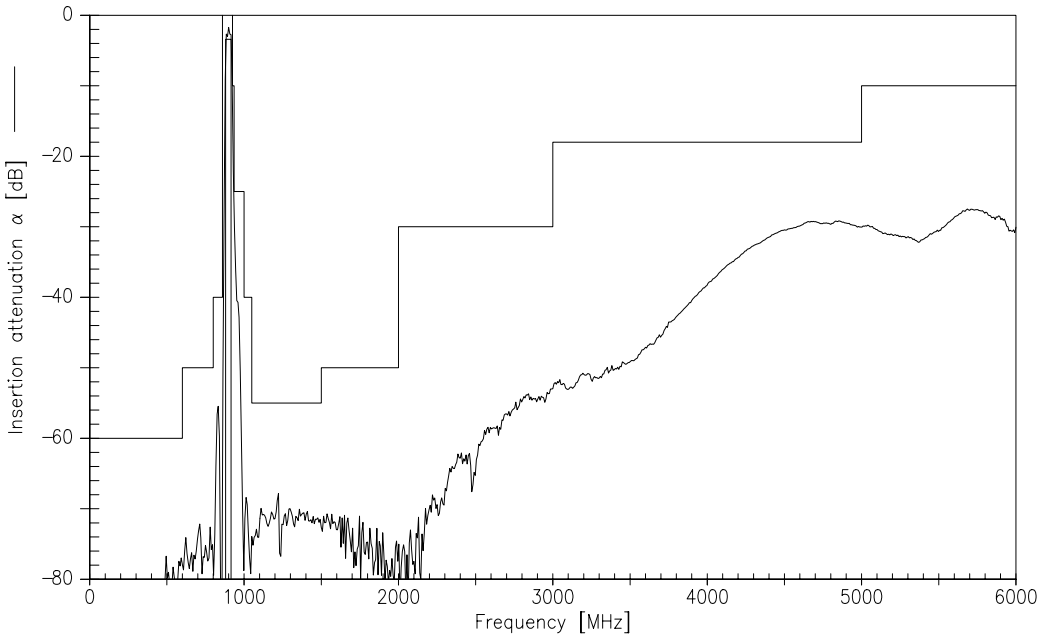
Operating temperature range: $T$ = -25 to +70 °C
Terminating source impedance: $Z_S$ = 50 Ω
Terminating load impedance: $Z_L$ = 200 Ω || 56 nH
( L simulated with Q factor 20 )

| | | | min. | typ. | max. | |
|---|---|---|---|---|---|---|
| **Center frequency** | $f_C$ | | — | 897,5 | — | MHz |
| **Maximum insertion attenuation** | $\alpha_{max}$ | | | | | |
| 880,0 ... 915,0 MHz | | | — | 3,4 | 4,5 | dB |
| **Amplitude ripple** (p-p) | $\Delta\alpha$ | | | | | |
| 880,0 ... 915,0 MHz | | | — | 1,8 | 2,9 | dB |
| **Input VSWR** | | | | | | |
| 880,0 ... 915,0 MHz | | | — | 2,1 | 2,4 | |
| **Output VSWR** | | | | | | |
| 880,0 ... 915,0 MHz | | | — | 2,4 | 2,5 | |
| **Attenuation** | $\alpha$ | | | | | |
| 0,0 ... 600,0 MHz | | | 60 | 77 | — | dB |
| 600,0 ... 800,0 MHz | | | 50 | 72 | — | dB |
| 800,0 ... 860,0 MHz | | | 35 | 44 | — | dB |
| 860,0 ... 870,0 MHz | | | 10 | 36 | — | dB |
| 925,0 ... 935,0 MHz | | | 7 | 11 | — | dB |
| 935,0 ... 960,0 MHz | | | 23 | 26 | — | dB |
| 960,0 ...1000,0 MHz | | | 25 | 40 | — | dB |
| 1000,0 ...1050,0 MHz | | | 40 | 64 | — | dB |
| 1050,0 ...1500,0 MHz | | | 55 | 68 | — | dB |
| 1500,0 ...2000,0 MHz | | | 50 | 70 | — | dB |
| 2000,0 ...3000,0 MHz | | | 30 | 44 | — | dB |
| 3000,0 ...5000,0 MHz | | | 18 | 29 | — | dB |
| 5000,0 ...6000,0 MHz | | | 10 | 28 | — | dB |
| **Symmetry in band** (referenced to the matched operating condition) | | | | | | |
| $\lvert S_{31}\rvert/\lvert S_{21}\rvert$ 880,0 ... 915,0 MHz | | | -1,0 | 0 | 1,0 | dB |
| $\arg(S_{31}/S_{21})$ 880,0 ... 915,0 MHz | | | 170 | 180 | 190 | ° |

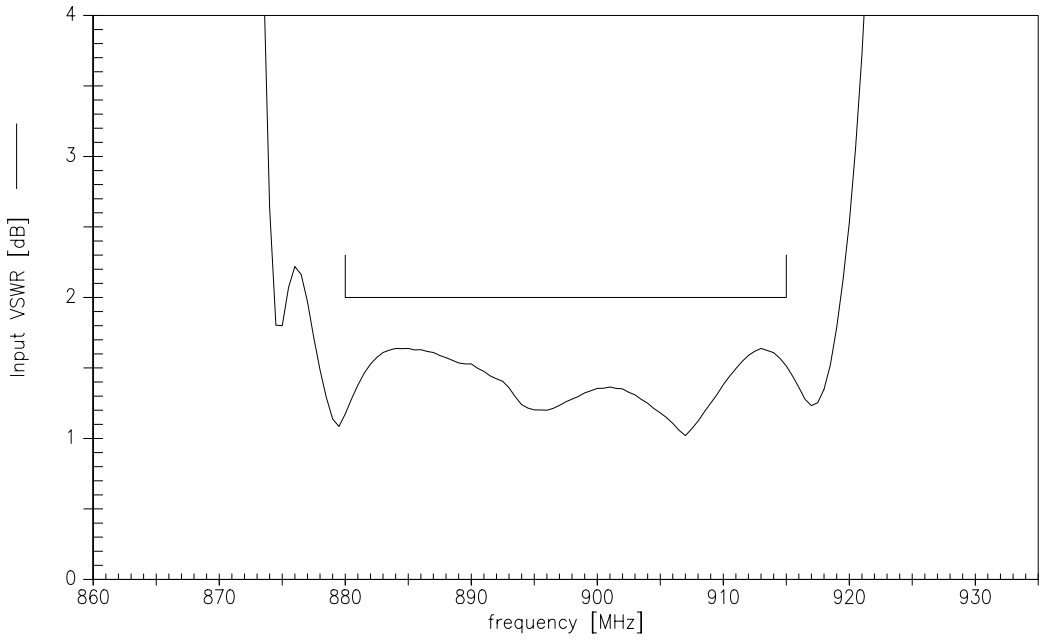
**Transfer function** ( spec at 25 ˚C )



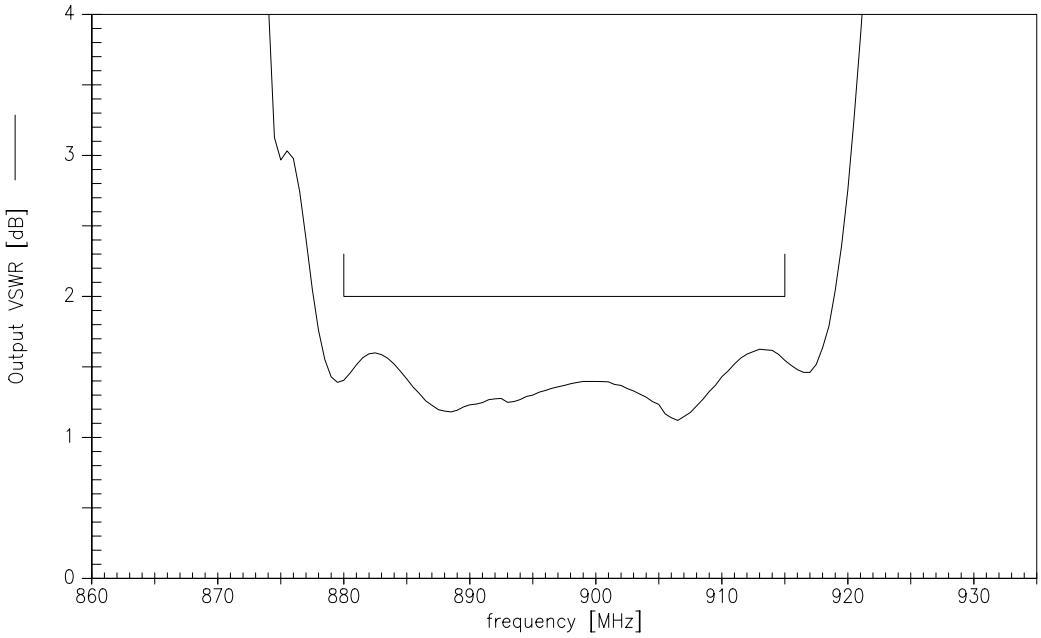

**Transfer function** ( wideband )



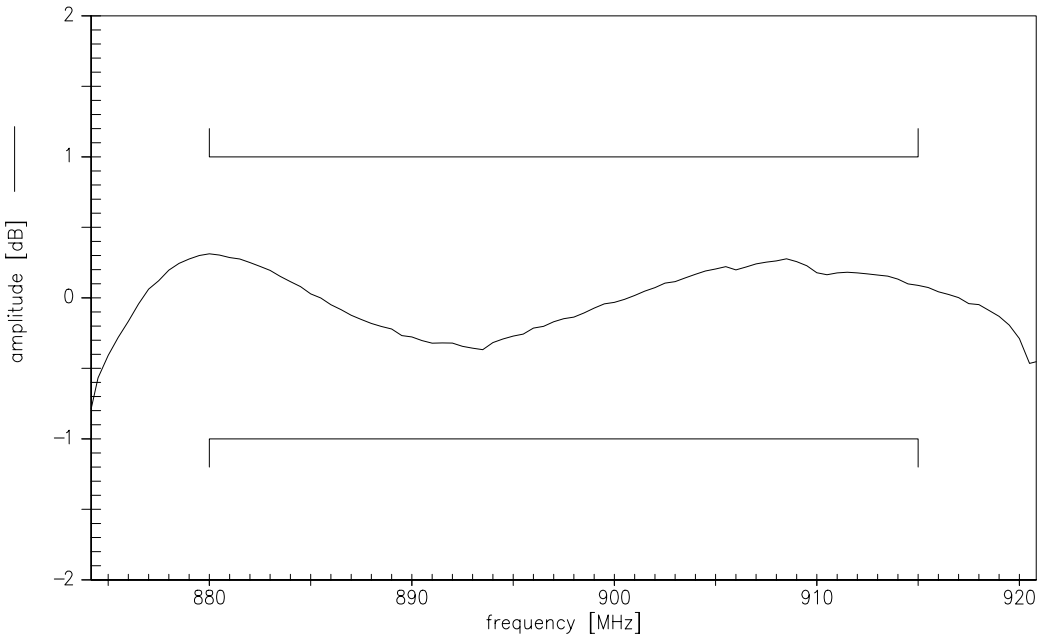
**Input VSWR** ( spec at 25 ˚C )



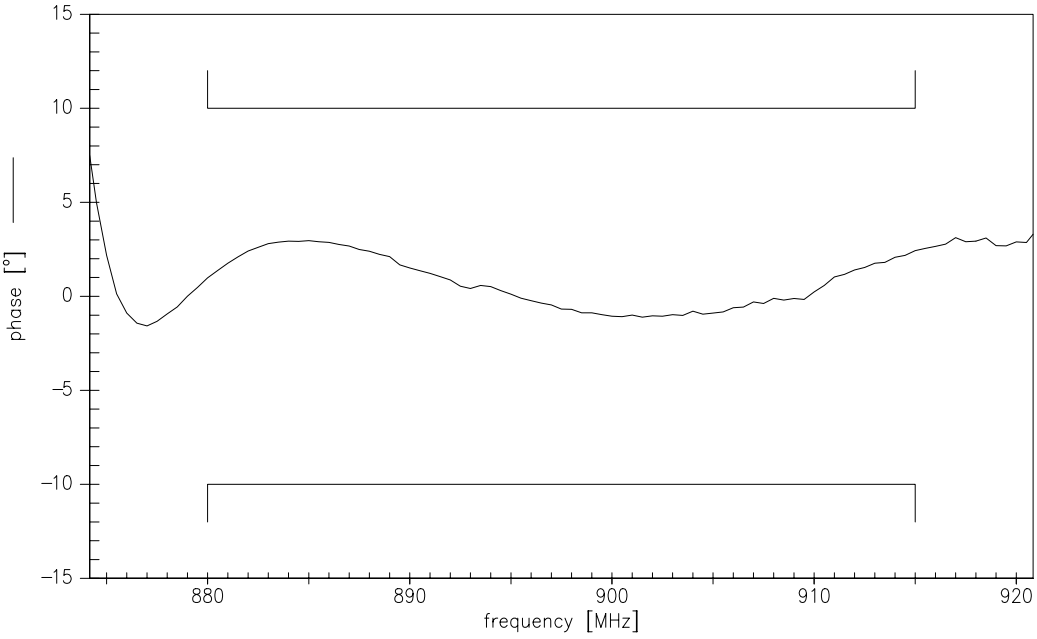

**Output VSWR**



**Amplitude Symmetry $|S_{31}|/|S_{21}|$** (referenced to the matched operating condition)




**Phase Symmetry $\arg(S_{31}/S_{21})$ - 180°** (referenced to the matched operating condition)



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