N-CHANNEL IG-MOS-FET

Symmetrical depletion type field-effect transistor in a TO-72 metal envelope with the substrate connected to the case. It is intended for chopper and other special switching applications, e.g. timing circuits, multiplex circuits, etc. The features are a very low drain-source 'on' resistance, a very high drain-source 'off' resistance and low feedback capacitances.

QUICK REFERENCE DATA

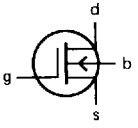
Drain-source resistance (on) at f = 1 kHz V_{DS} = 0; V_{GS} = 5 V; V_{BS} = 0	$R_{ds\ on}$	max.	50 Ω
Drain-source resistance (off) V_{DS} = 10 V; $-V_{GS}$ = 5 V; V_{BS} = 0	$R_{DS\ off}$	min.	10 GΩ
Feedback capacitance at f = 1 MHz			
$-V_{GS}$ = 5 V; V_{DS} = 0; I_B = 0	C_{rs}	typ.	0.5 pF
$-V_{GD}$ = 5 V; V_{SD} = 0; I_B = 0	C_{rd}	typ.	0.5 pF

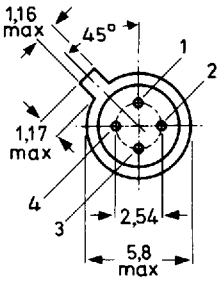
MECHANICAL DATA

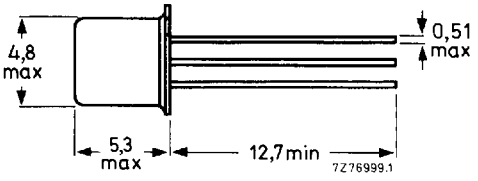
Dimensions in mm

Fig. 1 TO-72.

Pinning
1 = drain
2 = source
3 = gate
4 = substrate (b) connected to case







Accessories: 56246 (distance disc).

Note

To safeguard the gates against damage due to accumulation of static charge during transport or handling, the leads are encircled by a ring of conductive rubber which should be removed just after the transistor is soldered into the circuit.

Datasheet.Liv

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

Drain-substrate voltage	V_{DB}	max.	30 V
Source-substrate voltage	V_{SB}	max.	30 V
Gate-substrate voltage (continuous)	V_{GB}	max. min.	10 V −10 V
Repetitive peak gate to all other terminals voltage $V_{SB} = V_{DB} = 0$; $f > 100$ Hz	V_{G-N}	max. min.	15 V −15 V
Non-repetitive peak gate to all other terminals voltage $V_{SB} = V_{DB} = 0$; $t < 10$ ms	V_{G-N}	max. min.	50 V −50 V
Drain current (DC)	I_D	max.	25 mA
Drain current (peak value) $t_p = 20$ ms; $\delta = 0.1$	I_{DM}	max.	50 mA
Source current (peak value) $t_p = 20$ ms; $\delta = 0.1$	I_{SM}	max.	50 mA
Total power dissipation up to $T_{amb} = 25$ °C	P_{tot}	max.	200 mW
Storage temperature range	T_{stg}	−65 to + 125	°C
Junction temperature	T_j	max.	125 °C

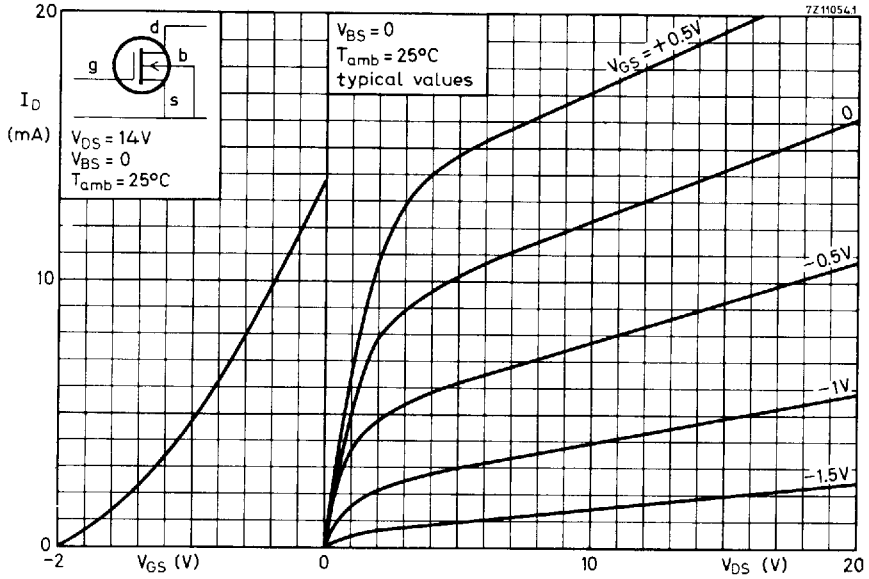
THERMAL RESISTANCE

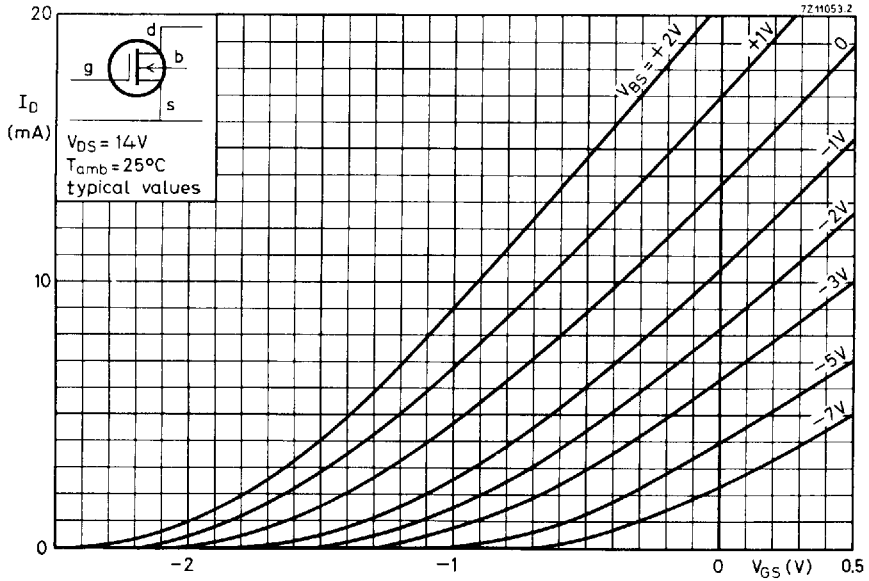
From junction to ambient in free air	$R_{th\ j-a}$	=	500 K/W

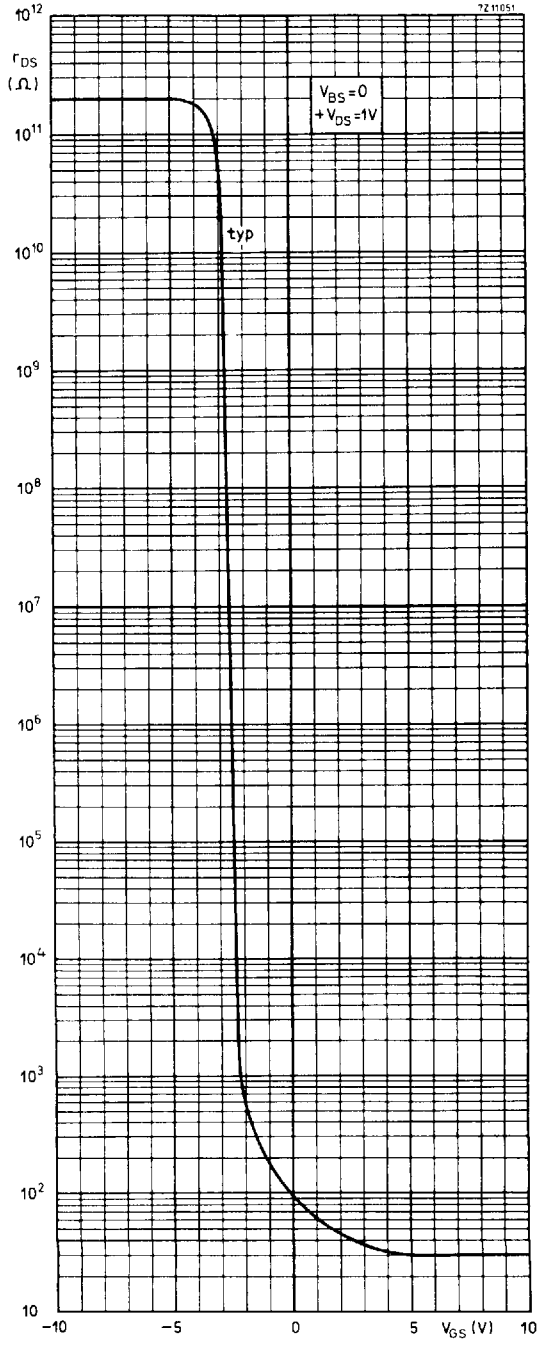
CHARACTERISTICS

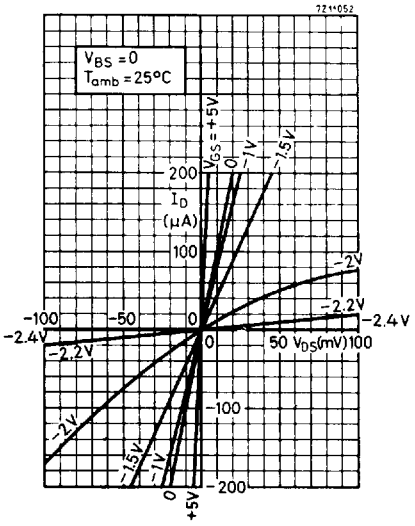
T_j = 25 °C unless otherwise specified

Drain cut-off currents; V_{BS} = 0				
V_{DS} = 10 V; $-V_{GS}$ = 5 V	I_{DSX}	<	1	nA
V_{DS} = 10 V; $-V_{GS}$ = 5 V; T_j = 125 °C	I_{DSX}	<	1	µA
Source cut-off currents; V_{BD} = 0				
V_{SD} = 10 V; $-V_{GD}$ = 5 V	I_{SDX}	<	1	nA
V_{SD} = 10 V; $-V_{GD}$ = 5 V; T_j = 125 °C	I_{SDX}	<	1	µA
Gate currents; V_{BS} = 0				
$-V_{GS}$ = 10 V; V_{DS} = 0	$-I_{GSS}$	<	10	pA
V_{GS} = 10 V; V_{DS} = 0	I_{GSS}	<	10	pA
$-V_{GS}$ = 10 V; V_{DS} = 0; T_j = 125 °C	$-I_{GSS}$	<	200	pA
V_{GS} = 10 V; V_{DS} = 0; T_j = 125 °C	I_{GSS}	<	200	pA
Bulk currents; V_{GB} = 0				
$-V_{BD}$ = 30 V; I_S = 0	$-I_{BDO}$	<	10	µA
$-V_{BS}$ = 30 V; I_D = 0	$-I_{BSO}$	<	10	µA
Drain-source resistance (on) at f = 1 kHz; V_{BS} = 0				
V_{GS} = 0 ; V_{DS} = 0	$R_{ds\ on}$	<	100	Ω
V_{GS} = 0 ; V_{DS} = 0; T_j = 125 °C	$R_{ds\ on}$	<	150	Ω
$+V_{GS}$ = 5 V; V_{DS} = 0	$R_{ds\ on}$	<	50	Ω
Drain-source resistance (off)				
$-V_{GS}$ = 5 V; V_{DS} = 10 V; V_{BS} = 0	$R_{DS\ off}$	>	10	GΩ
Feedback capacitances at f = 1 MHz				
$-V_{GS}$ = 5 V; V_{DS} = 0; I_B = 0	C_{rs}	typ.	0.5	pF
$-V_{GD}$ = 5 V; V_{SD} = 0; I_B = 0	C_{rd}	typ.	0.5	pF
Gate to all other terminals capacitance at f = 1 MHz				
$-V_{GB}$ = 5 V; V_{SB} = V_{DB} = 0	$C_{g\text{-}n}$	<	6	pF


7Z11054.1
d
g
b
s
V_{DS} = 14V
V_{BS} = 0
T_{amb} = 25°C
V_{BS} = 0
T_{amb} = 25°C
typical values
I_D (mA)
V_{GS} = +0.5V
0
−0.5V
−1V
−1.5V
20
10
0
−2
V_{GS} (V)
0
10
V_{DS} (V)
20


7Z11053.2
d
g
b
s
V_{DS} = 14V
T_{amb} = 25°C
typical values
I_D (mA)
V_{BS} = +2V
+1V
0
−1V
−2V
−3V
−5V
−7V
20
10
0
−2
−1
0
V_{GS} (V)
0.5


7Z11051
r_{DS} (Ω)
10^{12}
10^{11}
10^{10}
10^{9}
10^{8}
10^{7}
10^{6}
10^{5}
10^{4}
10^{3}
10^{2}
10
V_{BS} = 0
$+V_{DS}$ = 1V
typ
−10
−5
0
5
10
V_{GS} (V)


7Z11052
V_{BS} = 0
T_{amb} = 25°C
V_{GS} = +5V
0
−1V
−1.5V
200
I_D (μA)
100
−2V
−2.2V
−2.4V
−100
−50
0
50
V_{DS}(mV)
100
−2.4V
−2.2V
−2V
−1.5V
−1V
0
+5V
−100
−200