

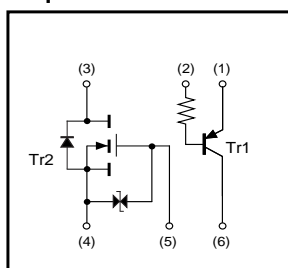
EMF32 / UMF32N

●Application

● Features

● Structure

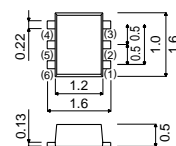
●Equivalent circuits



●Packaging specifications

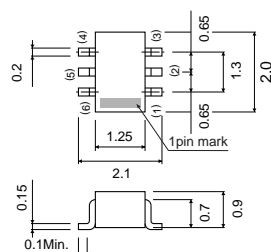
Type	EMF32	UMF32
Package	EMT6	UMT6
Marking	F32	F32
Code	T2R	TR
Basic ordering unit (pieces)	8000	3000

●External dimensions (Unit : mm)



Each lead has
same dimensions

Abbreviated symbol : F32



Each lead has
same dimensions

Abbreviated symbol : F32

Transistors

●Absolute maximum ratings (Ta=25°C)

Tr1

Parameter	Symbol	Limits	Unit
Collector-base voltage	V _{CBO}	−50	V
Collector-emitter voltage	V _{CEO}	−50	V
Emitter-base voltage	V _{EBO}	−5	V
Collector current	I _C	−100	mA
Power dissipation	P _C	150(TOTAL)	mW *1
Junction temperature	T _J	150	°C
Range of storage temperature	T _{stg}	−55 to +150	°C

*1 120mW per element must not be exceeded. Each terminal mounted on a recommended land.

Tr2

Parameter	Symbol	Limits	Unit
Drain-source voltage	V _{DSS}	30	V
Gate-source voltage	V _{GSS}	±20	V
Drain current	Continuous	I _D	100 mA
	Pulsed	I _{DP}	200 mA *1
Reverse drain current	Continuous	I _{DR}	100 mA
	Pulsed	I _{DRP}	200 mA *1
Total power dissipation	P _D	150(TOTAL)	mW *2
Channel temperature	T _{ch}	150	°C
Range of storage temperature	T _{stg}	−55 to +150	°C

*1 PW≤10ms Duty cycle≤50%

*2 120mW per element must not be exceeded. Each terminal mounted on a recommended land.

●Electrical characteristics (Ta=25°C)

Tr1

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV _{CBO}	−50	−	−	V	I _C = −50μA
Collector-emitter breakdown voltage	BV _{CEO}	−50	−	−	V	I _C = −1mA
Emitter-base breakdown voltage	BV _{EBO}	−5	−	−	V	I _E = −50μA
Collector cutoff current	I _{CBO}	−	−	−0.5	μA	V _{CB} = −50V
Emitter cutoff current	I _{EBO}	−	−	−0.5	μA	V _{EB} = −4V
Collector-emitter saturation voltage	V _{CE(sat)}	−	−	−0.3	V	I _C /I _B = −5mA/ −0.25mA
DC current transfer ratio	h _{FE}	100	250	600	−	I _C = −1mA, V _{CE} = −5V
Input resistance	R _i	3.29	4.7	6.11	kΩ	−
Transition frequency	f _T	−	250	−	MHz	V _{CE} = −10V, I _E =5mA, f=100MHz *

* Transition frequency of the device

Tr2

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I _{GSS}	−	−	±1	μA	V _{GS} =±20V, V _{DS} =0V
Drain-source breakdown voltage	V _{(BR)DSS}	30	−	−	V	I _D =10μA, V _{GS} =0V
Zero gate voltage drain current	I _{DSS}	−	−	1.0	μA	V _{DS} =30V, V _{GS} =0V
Gate-threshold voltage	V _{GS(th)}	0.8	−	1.5	V	V _{DS} =3V, I _D =100μA
Static drain-source on-state resistance	R _{DS(on)}	−	5	8	Ω	I _D =10mA, V _{GS} =4V
		−	7	13	Ω	I _D =1mA, V _{GS} =2.5V
Forward transfer admittance	Y _{fs}	20	−	−	ms	V _{DS} =3V, I _D =10mA
Input capacitance	C _{iss}	−	13	−	pF	V _{DS} =5V, V _{GS} =0V, f=1MHz
Output capacitance	C _{oss}	−	9	−	pF	
Reverse transfer capacitance	C _{rss}	−	4	−	pF	
Turn-on delay time	t _{d(on)}	−	15	−	ns	I _D =10mA, V _{DD} ≈ 5V, V _{GS} =5V, R _L =500Ω, R _{GS} =10Ω
Rise time	t _r	−	35	−	ns	
Turn-off delay time	t _{d(off)}	−	80	−	ns	
Fall time	t _f	−	80	−	ns	

Transistors

●Electrical characteristic curves

Tr1

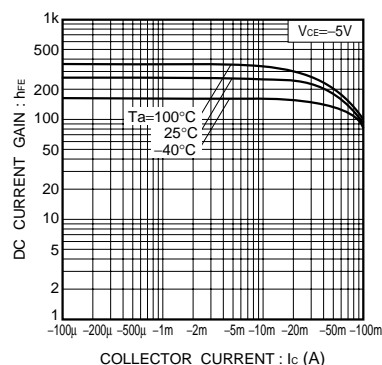


Fig.1 DC current gain vs. collector current

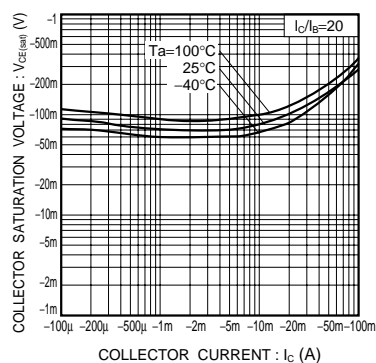


Fig.2 Collector-emitter saturation voltage vs. collector current

Tr2

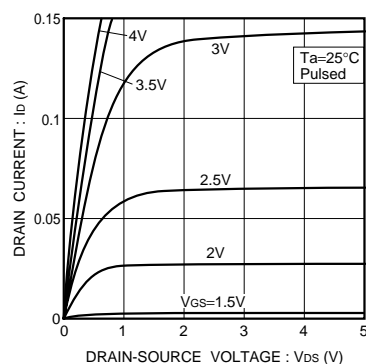


Fig.3 Typical output characteristics

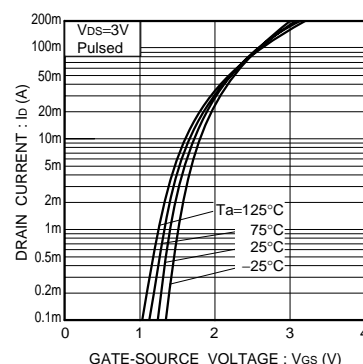


Fig.4 Typical transfer characteristics

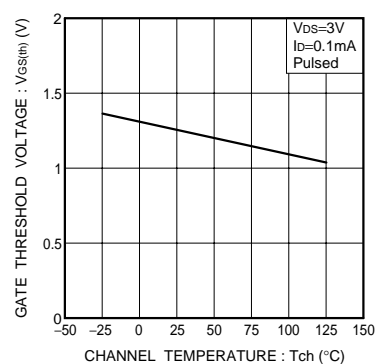


Fig.5 Gate threshold voltage vs. channel temperature

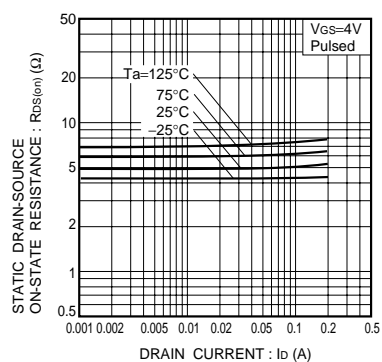


Fig.6 Static drain-source on-state resistance vs. drain current (I)

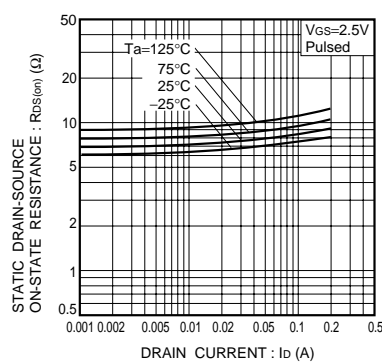


Fig.7 Static drain-source on-state resistance vs. drain current (II)

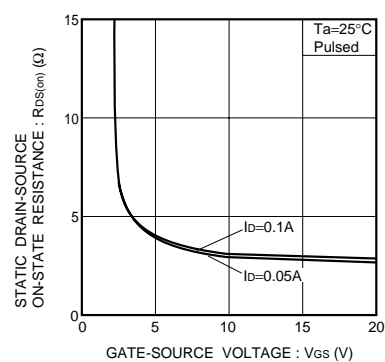


Fig.8 Static drain-source on-state resistance vs. gate-source voltage

Transistors

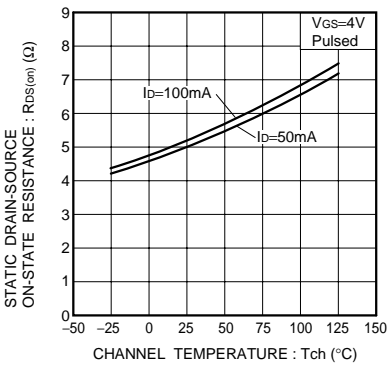


Fig.9 Static drain-source on-state resistance vs. channel temperature

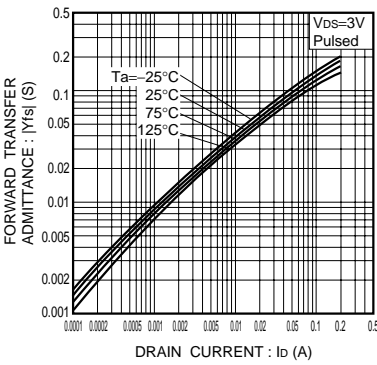


Fig.10 Forward transfer admittance vs. drain current

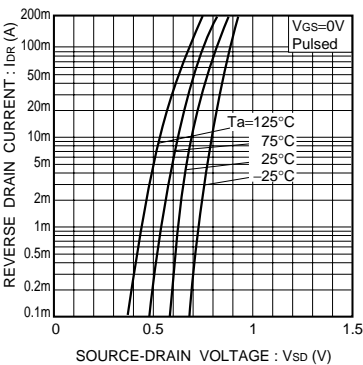


Fig.11 Reverse drain current vs. source-drain voltage (I)

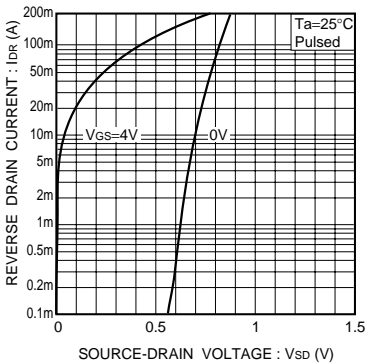


Fig.12 Reverse drain current vs. source-drain voltage (II)

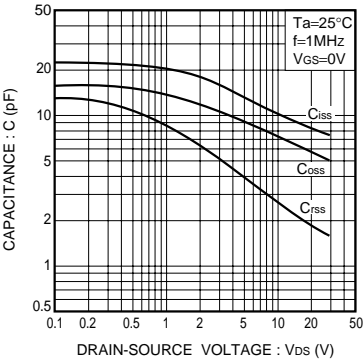


Fig.13 Typical capacitance vs. drain-source voltage

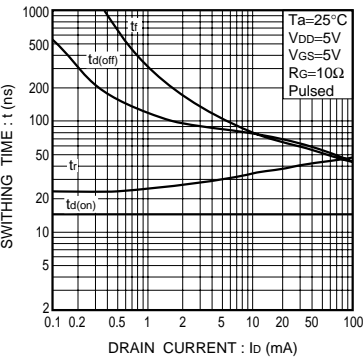


Fig.14 Switching characteristics

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