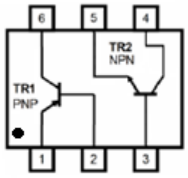
NPN+PNP Small Signal Surface Mount Transistor

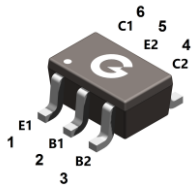
UMZ2N

Features

HF

- Epitaxial planar die construction
- Two internal isolated NPN/PNP transistors in one package
- Ultra-small surface mount package
- RoHS compliant with Halogen-free





SOT-363

Mechanical Data

- Case: SOT-363
- Molding compound: UL flammability classification rating 94V-0
- Terminals: Tin-plated; solderability per MIL-STD-202, Method 208

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
UMZ2N	SOT-363	3000 pcs / Tape & Reel	Z2

Maximum Ratings (@ T_A = 25℃ unless otherwise specified)

Parameter	Symbol	NPN	PNP	Unit
Collector-Base Voltage	V_{CBO}	60	-60	V
Collector-Emitter Voltage	V_{CEO}	50	-50	V
Emitter-Base Voltage	V_{EBO}	7	-6	V
Collector Current (Continuous)	I_C	150	-150	mA
Peak Collector Current (t_p ≤1ms)	I_{CM}	200	-200	mA

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation (per transistor)	P_D	150	mW
Power Dissipation (per device)		300	mW
Thermal Resistance Junction-to-Air *1	$R_{\theta JA}$	370	°C/W
Thermal Resistance Junction-to-Case *1	$R_{\theta JC}$	250	°C/W
Thermal Resistance Junction-to-Lead *1	$R_{\theta JL}$	300	°C/W
Operating Junction Temperature	T_J	-55 ~ +150	°C
Storage Temperature Range	T_{STG}	-55 ~ +150	°C

Note 1: The data tested by surface mounted on a 1 $inch^2$ FR-4 board with 2OZ copper

Electrical Characteristics of NPN Transistor (@ T_A = 25℃ unless otherwise specified)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C = 50μA, I_E = 0	60	-	-	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = 1mA, I_B = 0	50	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E = 50μA, I_C = 0	7	-	-	V
Collector Cut-off Current	I_{CBO}	V_{CB} = 60V, I_E = 0	-	-	100	nA
Emitter Cut-Off Current	I_{EBO}	V_{EB} = 7V, I_C = 0	-	-	100	nA
DC Current Gain	h_{FE}	V_{CE} = 6V, I_C = 1mA	120	-	560	-
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 50mA, I_B = 5mA	-	-	0.4	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C = 50mA, I_B = 5mA	-	-	1.1	V
Transition Frequency	f_T	V_{CE} = 12V, I_C= 2mA f = 100MHz	-	180	-	MHz
Output Capacitance	C_{OBO}	V_{CB} = 10V, f = 1.0MHz	-	-	3.5	pF

Electrical Characteristics of PNP Transistor (@ T_A = 25℃ unless otherwise specified)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C = -50μA, I_E = 0	-60	-	-	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = -1mA, I_B = 0	-50	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E = -50μA, I_C = 0	-6	-	-	V
Collector Cut-off Current	I_{CBO}	V_{CB} = -60V, I_E = 0	-	-	-100	nA
Emitter Cut-Off Current	I_{EBO}	V_{EB} = -6V, I_C = 0	-	-	-100	nA
DC Current Gain	h_{FE}	V_{CE} = -6V, I_C = -1mA	120	-	560	-
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = -50mA, I_B = -5mA	-	-	-0.5	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C = -50mA, I_B = -5mA	-	-	-1.1	V
Transition Frequency	f_T	V_{CE} = -5V, I_C= -10mA f = 100MHz	100	-	-	MHz
Output Capacitance	C_{OBO}	V_{CB} = -10V, f = 1.0MHz	-	-	5	pF

Ratings and Characteristic Curves - NPN (@ T_A = 25°C unless otherwise specified)

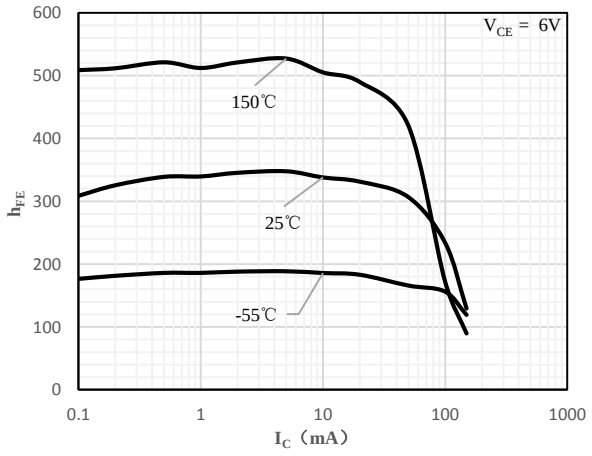


Fig 1 h_{FE} vs. I_C

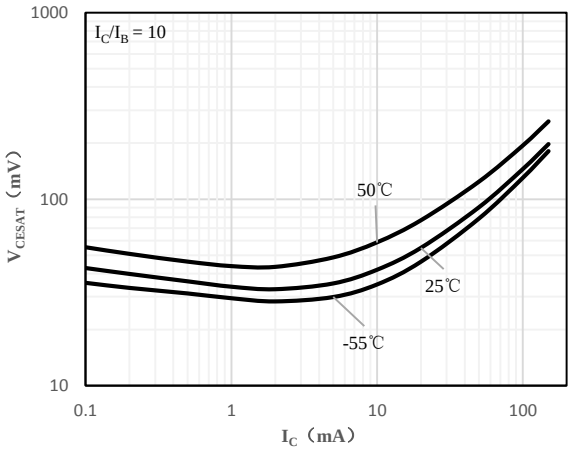


Fig 2 $V_{CE(sat)}$ vs. I_C

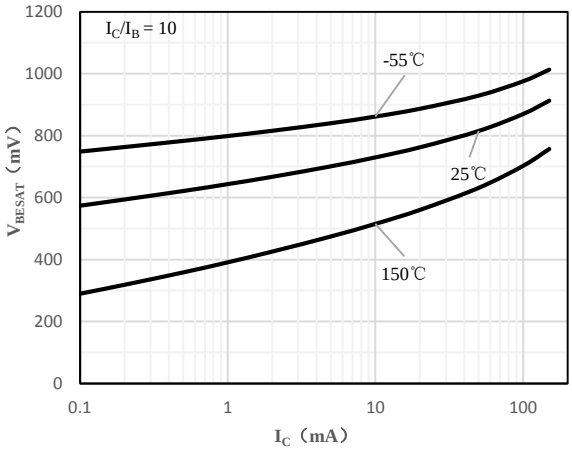


Fig 3 $V_{BE(sat)}$ vs. I_C

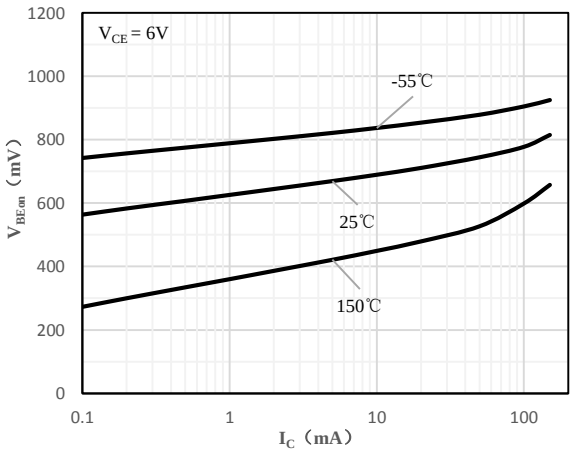


Fig 4 $V_{BE(ON)}$ vs. I_C

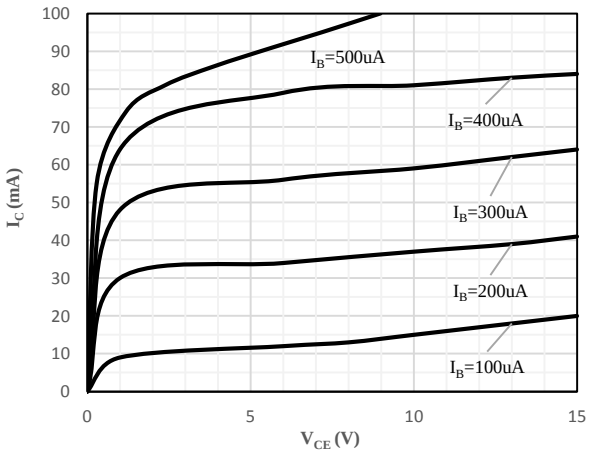


Fig 5 I_C vs. V_{CE}

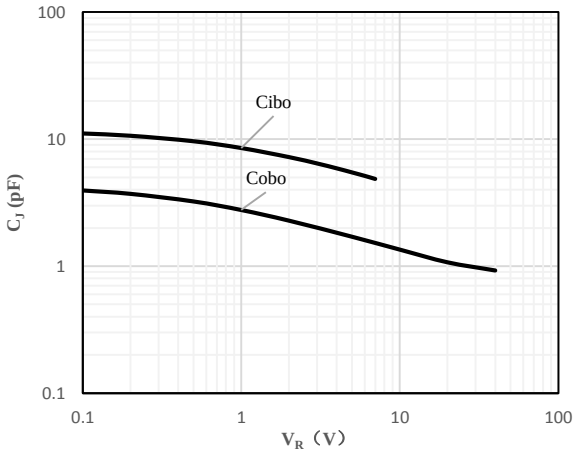


Fig 6 C_J vs. V_R

Ratings and Characteristic Curves - PNP (@ T_A = 25°C unless otherwise specified)

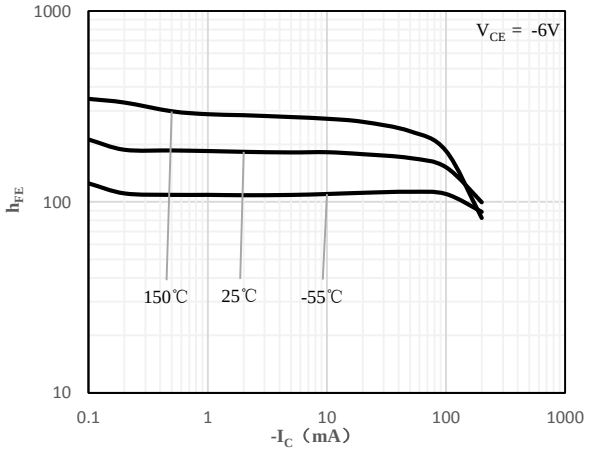


Fig 1 h_{FE} vs. I_C

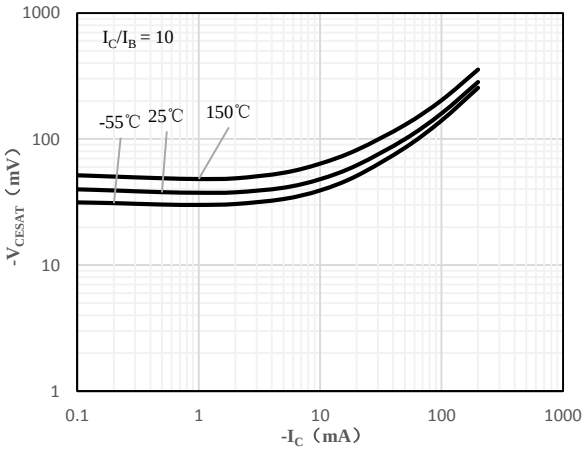


Fig 2 $V_{CE(sat)}$ vs. I_C

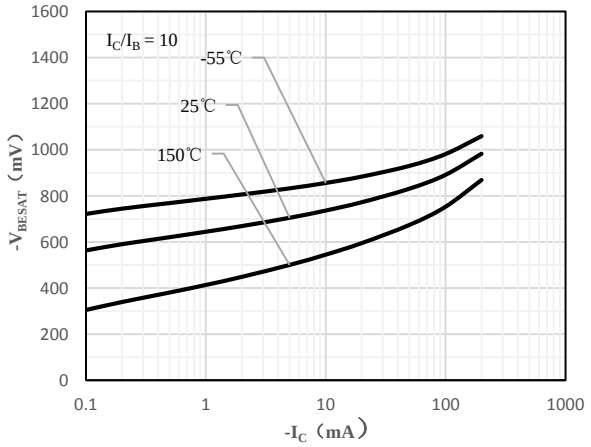


Fig 3 $V_{BE(sat)}$ vs. I_C

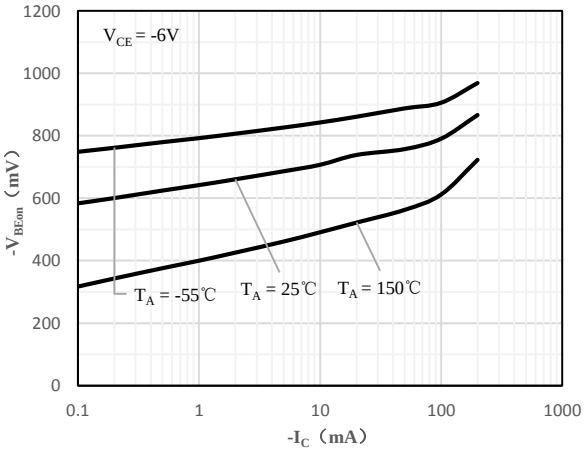


Fig 4 $V_{BE(ON)}$ vs. I_C

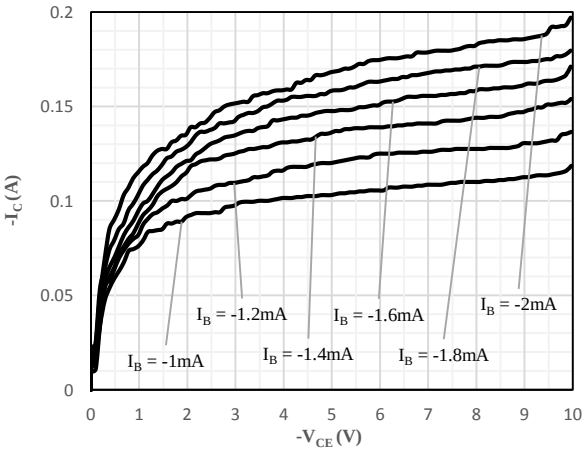


Fig 5 I_C vs. V_{CE}

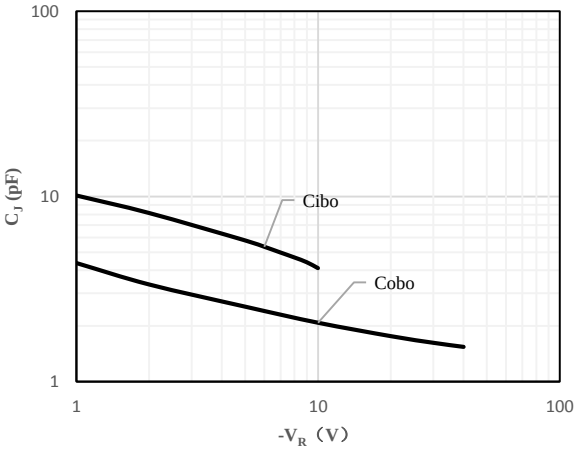
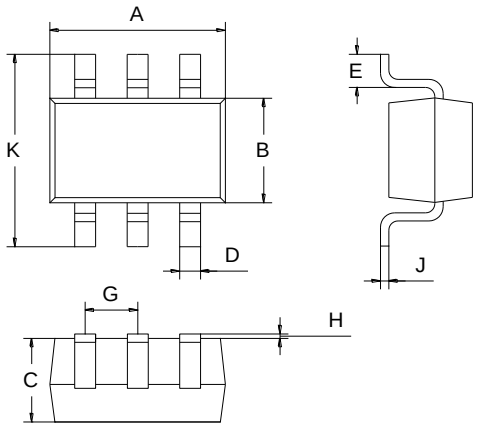


Fig 6 C_J vs. V_R

Package Outline Dimensions (Unit: mm)



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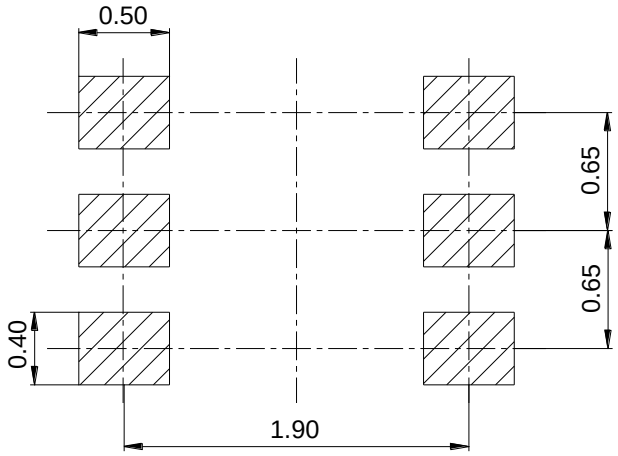
Dimension	**Min.**	**Max.**
A	2.00	2.20
B	1.15	1.35
C	0.85	1.05
D	0.15	0.35
E	0.25	0.40
G	0.60	0.70
H	0.02	0.10
J	0.05	0.15
K	2.20	2.40

Package Outline Dimensions (Unit: mm)

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