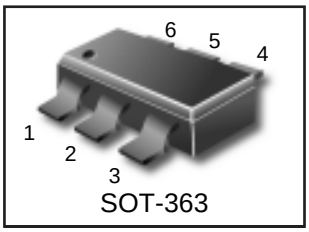
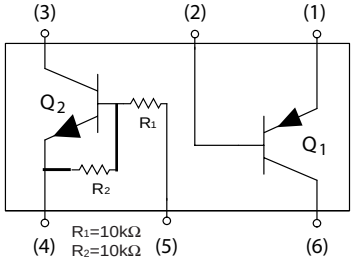
Power Management(dual transistors)

UMF23NDW1T1G





●Application

Power management circuit

●Features

1) Power switching circuit in a single package.
2) Mounting cost and area can be cut in half.
3) We declare that the material of product compliance with RoHS requirements.

●Structure

Silicon epitaxial planar transistor

DEVICE MARKING AND ORDERING INFORMATION

Device	Marking	Shipping
UMF23NDW1T1G	F23	3000/Tape&Reel
UMF23NDW1T3G	F23	10000/Tape&Reel

●Absolute maximum ratings (Ta=25°C)

Tr1

Parameter	Symbol	Limits	Unit
Collector-base voltage	V_{CBO}	–60	V
Collector-emitter voltage	V_{CEO}	–50	V
Emitter-base voltage	V_{EBO}	–6	V
Collector current	I_C	–150	mA
Collector power dissipation	P_C	150 (TOTAL)	mW *
Junction temperature	Tj	150	℃
Storage temperature	Tstg	–55 to +150	℃

* 120mW per element must not be exceeded.

Tr2

Parameter	Symbol	Limits	Unit
Supply voltage	V_{CC}	50	V
Input voltage	V_{IN}	–10~+40	V
Collector current	I_C	100	mA *1
Output current	I_O	50	mA
Power dissipation	P_C	150(TOTAL)	mW *2
Junction temperature	Tj	150	℃
Range of storage temperature	Tstg	–55 to +150	℃

*1 Characteristics of built-in transistor.
*2 120mW per element must not be exceeded.
Each terminal mounted on a recommended land.

UMF23NDW1T1G

●Electrical characteristics (Ta=25°C)

Tr1

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	–60	–	–	V	I_C=–50μA
Collector-emitter breakdown voltage	BV_{CEO}	–50	–	–	V	I_C=–1mA
Emitter-base breakdown voltage	BV_{EBO}	–6	–	–	V	I_E=–50μA
Collector cutoff current	I_{CBO}	–	–	–0.1	μA	V_{CB}=–60V
Emitter cutoff current	I_{EBO}	–	–	–0.1	μA	V_{EB}=–6V
Collector-emitter saturation voltage	$V_{CE\ (sat)}$	–	–	–0.5	V	I_C/I_B=–50mA/–5mA
DC current transfer ratio	h_{FE}	180	–	390	–	V_{CE}=–6V, I_C=–1mA
Transition frequency	f_T	–	140	–	MHz	V_{CE}=–12V, I_E=2mA, f=100MHz
Output capacitance	Cob	–	4	5	pF	V_{CB}=–12V, I_E=0A, f=1MHz

Tr2

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	–	–	0.5	V	V_{CC}=5V, I_O=100μA
	$V_{I(on)}$	3	–	–		V_O=0.3V, I_O=10mA
Output voltage	$V_{O(on)}$	–	0.1	0.3	V	I_O/I_I=10mA/0.5mA
Input current	I_I	–	–	0.88	mA	V_I=5V
Output current	$I_{O(off)}$	–	–	0.5	μA	V_{CC}=50V, V_I=0V
DC current gain	G_I	30	–	–	–	V_O=5V, I_O=5mA
Input resistance	R_1	7	10	13	kΩ	–
Resistance ratio	R_2/R_1	0.8	1	1.2	–	–
Transition frequency	f_T	–	250	–	MHz	V_{CE}=10V, I_E=–5mA, f=100MHz *

* Transition frequency of the device

UMF23NDW1T1G

●Electrical characteristic curves

Tr1

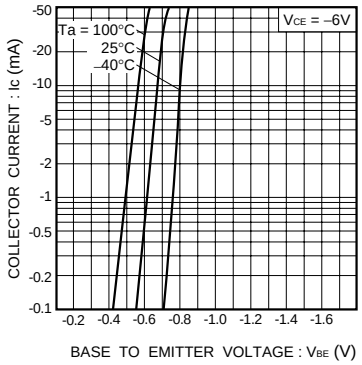


Fig.1 Grounded emitter propagation characteristics

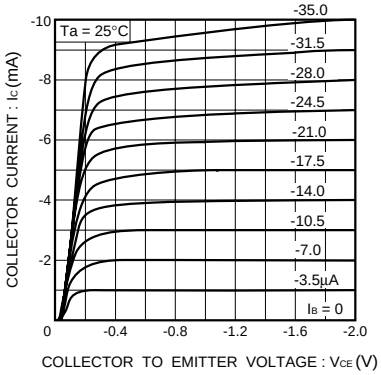


Fig.2 Grounded emitter output characteristics (I)

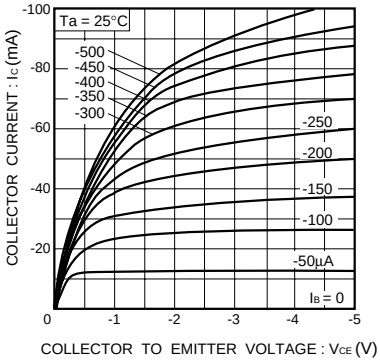


Fig.3 Grounded emitter output characteristics (II)

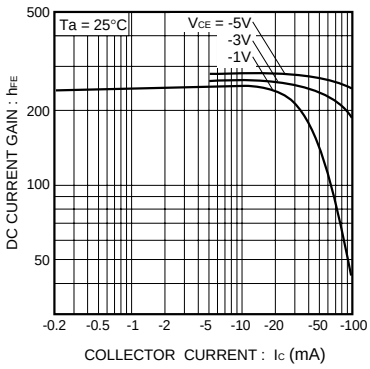


Fig.4 DC current gain vs. collector current (I)

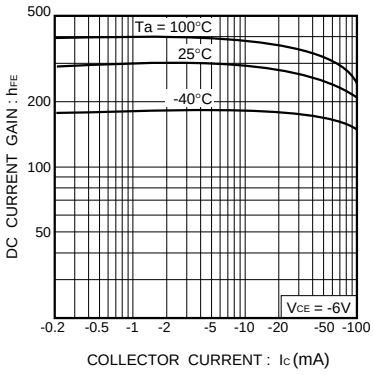


Fig.5 DC current gain vs. collector current (II)

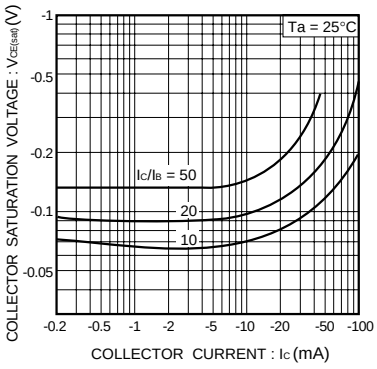


Fig.6 Collector-emitter saturation voltage vs. collector current (I)

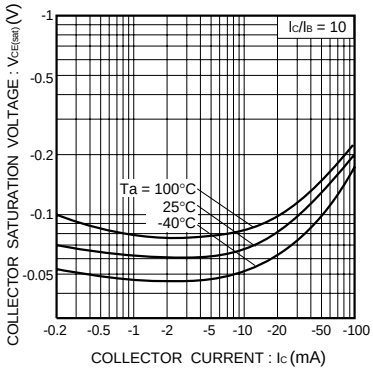


Fig.7 Collector-emitter saturation voltage vs. collector current (II)

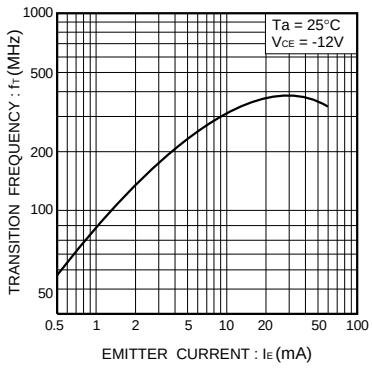


Fig.8 Gain bandwidth product vs. emitter current

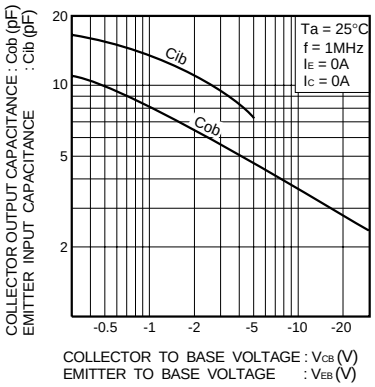


Fig.9 Collector output capacitance vs. collector-base voltage
Emitter input capacitance vs. emitter-base voltage

UMF23NDW1T1G

Tr2

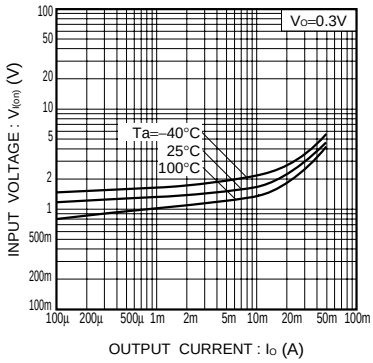


Fig.1 Input voltage vs. output current (ON characteristics)

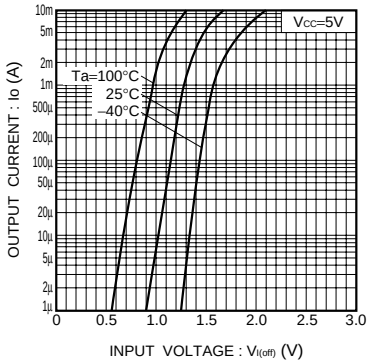


Fig.2 Output current vs. input voltage (OFF characteristics)

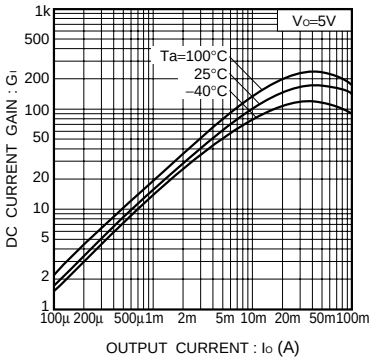


Fig.3 DC current gain vs. output current

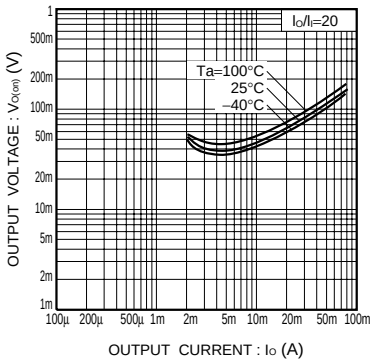
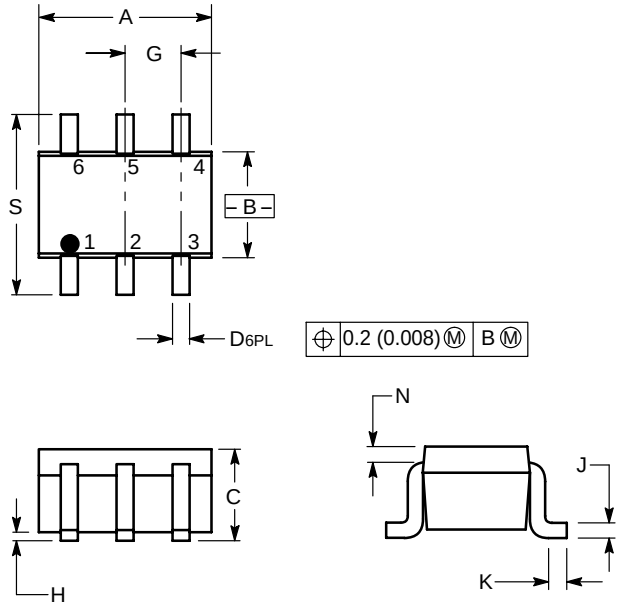


Fig.4 Output voltage vs. output current

UMF23NDW1T1G

SC−88/SOT−363



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.071	0.087	1.80	2.20
B	0.045	0.053	1.15	1.35
C	0.031	0.043	0.80	1.10
D	0.004	0.012	0.10	0.30
G	0.026 BSC		0.65 BSC	
H	---	0.004	---	0.10
J	0.004	0.010	0.10	0.25
K	0.004	0.012	0.10	0.30
N	0.008 REF		0.20 REF	
S	0.079	0.087	2.00	2.20

PIN 1. EMITTER 2
2. BASE 2
3. COLLECTOR 1
4.EMITTER 1
5. BASE 1
6.COLLECTOR 2