

<For Tr1>

Parameter	Value
V_{CEO}	-12V
I_C	-500mA

<For DTr2>

Parameter	Value
V_{CC}	50V
$I_{C(Max.)}$	100mA

●Features

- 1)Power switching circuit in a single package.
- 2)Mounting cost and area can be cut in half.

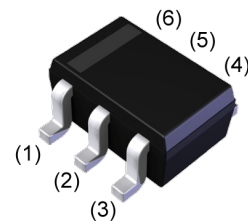
●Application

Power manegement circuit

●Outline

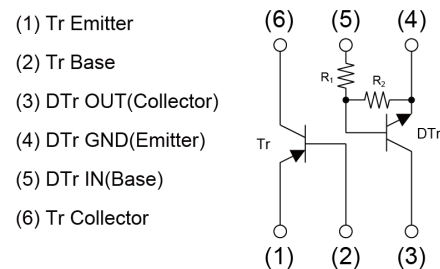
SOT-363

SC-88



UMT6

●Inner circuit



●Packaging specifications

Part No.	Package	Package size	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit.(pcs)	Marking
UMF5N	SOT-363 (UMT6)	2021	TR	180	8	3000	F5

● **Absolute maximum ratings** ($T_a = 25^\circ\text{C}$)

<Tr1>

Parameter	Symbol	Limits	Unit
Collector-base voltage	V_{CBO}	-15	V
Collector-emitter voltage	V_{CEO}	-12	V
Emitter-base voltage	V_{EBO}	-6	V
Collector current	I_C	-500	mA
	I_{CP}^{*1}	-1	A

<DTr2>

Parameter	Symbol	Limits	Unit
Supply voltage	V_{CC}	50	V
Input voltage	V_{IN}	-10 to 40	V
Output current	I_O	30	mA
Collector current	$I_{C(MAX)}$	100	mA

<Tr1> <DTr2>

Parameter	Symbol	Limits	Unit
Power dissipation	P_D^{*2*4}	150	mW
Junction temperature	T_j	150	$^\circ\text{C}$
Range of storage temperature	T_{stg}	-55 to 150	$^\circ\text{C}$

●Electrical characteristics ($T_a = 25^\circ\text{C}$) <For Tr1>

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Collector-base breakdown voltage	BV_{CBO}	$I_C = -10\mu\text{A}$	-15	-	-	V
Collector-emitter breakdown voltage	BV_{CEO}	$I_C = -1\text{mA}$	-12	-	-	V
Emitter-base breakdown voltage	BV_{EBO}	$I_E = -10\mu\text{A}$	-6	-	-	V
Collector cut-off current	I_{CBO}	$V_{CB} = -15\text{V}$	-	-	-100	nA
Emitter cut-off current	I_{EBO}	$V_{EB} = -6\text{V}$	-	-	-100	nA
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = -200\text{mA}$, $I_B = -10\text{mA}$	-	-100	-250	mV
DC current gain	h_{FE}	$V_{CE} = -2\text{V}$, $I_C = -10\text{mA}$	270	-	680	-
Transition frequency	f_T	$V_{CE} = -2\text{V}$, $I_E = 10\text{mA}$, $f = 100\text{MHz}$	-	260	-	MHz
Output capacitance	C_{ob}	$V_{CB} = -10\text{V}$, $I_E = 0\text{A}$, $f = 1\text{MHz}$	-	6.5	-	pF

●Electrical characteristics ($T_a = 25^\circ\text{C}$) <For DTr2>

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input voltage	$V_{I(off)}$	$V_{CC} = 5\text{V}$, $I_O = 100\mu\text{A}$	-	-	0.5	V
	$V_{I(on)}$	$V_O = 0.3\text{V}$, $I_O = 2\text{mA}$	3	-	-	V
Output voltage	$V_{O(on)}$	$I_O / I_I = 10\text{mA} / 0.5\text{mA}$	-	100	300	mV
Input current	I_I	$V_I = 5\text{V}$	-	-	180	μA
Output current	$I_{O(off)}$	$V_{CC} = 50\text{V}$, $V_I = 0\text{V}$	-	-	500	nA
DC current gain	G_I	$V_O = 5\text{V}$, $I_O = 5\text{mA}$	68	-	-	-
Input resistance	R_1	-	32.9	47	61.1	k Ω
Resistance ratio	R_2/R_1	-	0.8	1.0	1.2	-
Transition frequency	f_T^{*3}	$V_{CE} = 10\text{V}$, $I_E = -5\text{mA}$, $f = 100\text{MHz}$		250	-	MHz

*1 $P_w=1\text{ms}$ Single pulse

*2 Each terminal mounted on a reference land.

*3 Characteristics of built-in transistor.

*4 120mW per element must not be exceeded.

●Electrical characteristic curves($T_a=25^\circ\text{C}$) <For Tr1>

Fig.1 Ground Emitter Propagation Characteristics

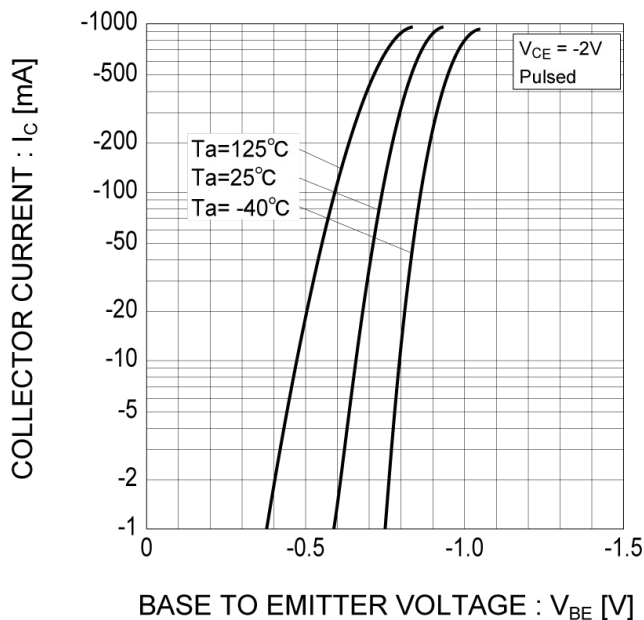


Fig.2 Typical Output Characteristics

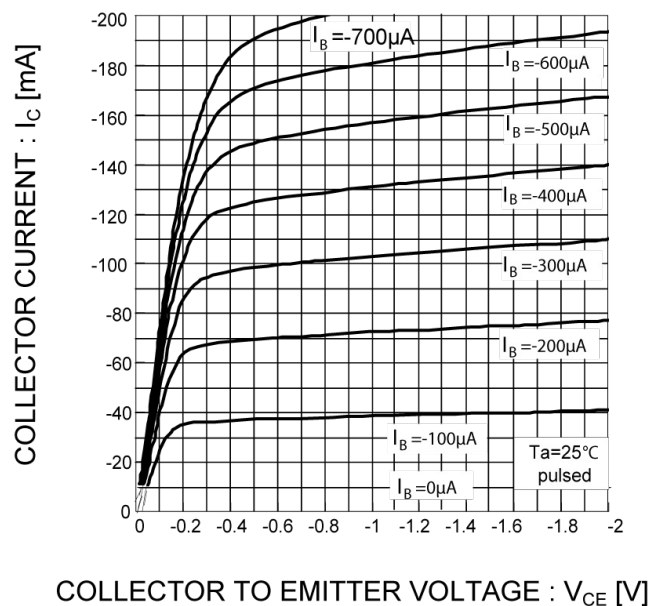


Fig.3 DC Current Gain vs. Collector Current (I)

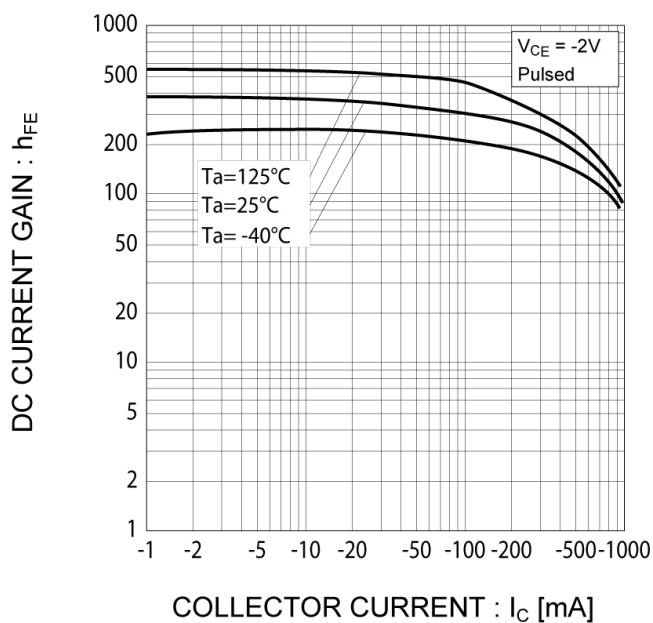
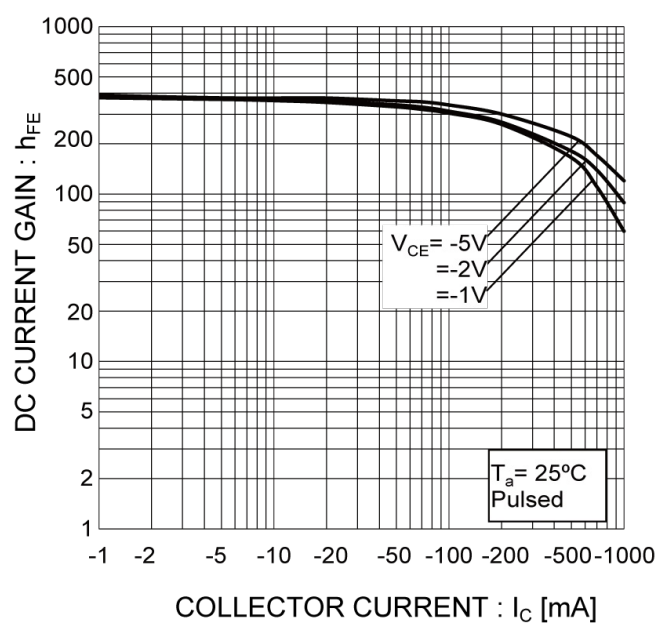


Fig.4 DC Current Gain vs. Collector Current (II)



●Electrical characteristic curves($T_a=25^\circ\text{C}$) <For Tr1>

Fig.5 Collector-Emitter Saturation
Voltage vs. Collector Current (I)

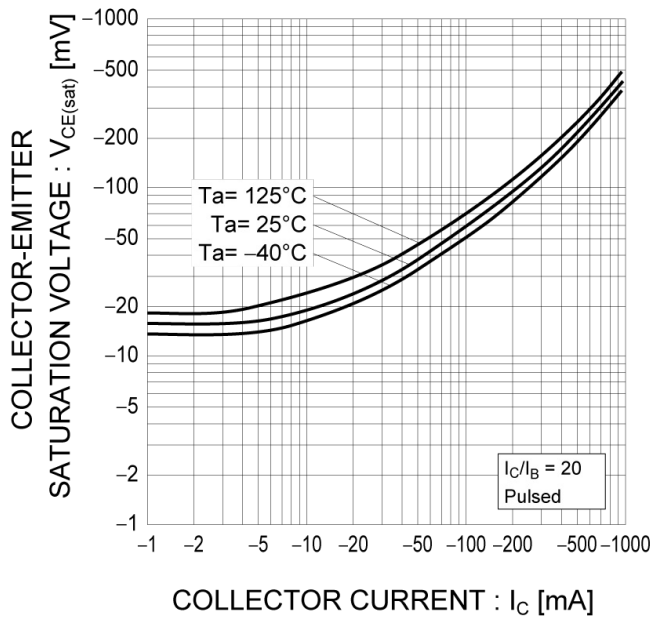


Fig.6 Collector-Emitter Saturation
Voltage vs. Collector Current (II)

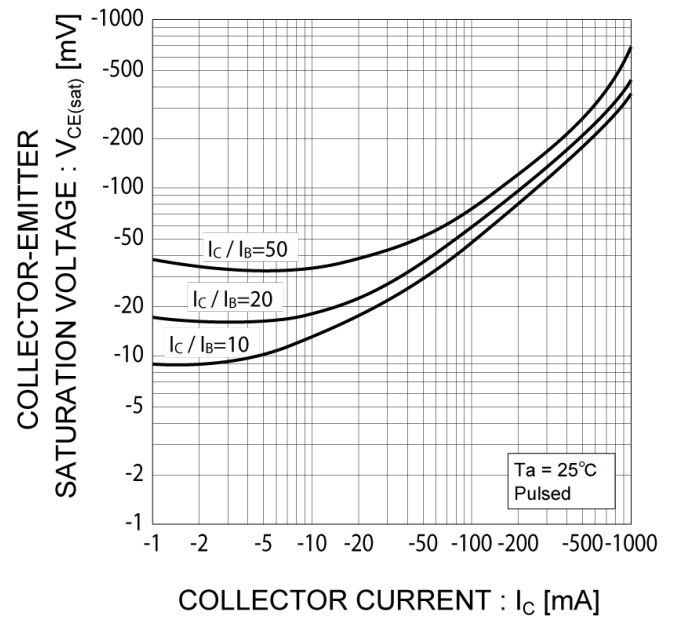


Fig.7 Base-Emitter Saturation Voltage vs.
Collector Current

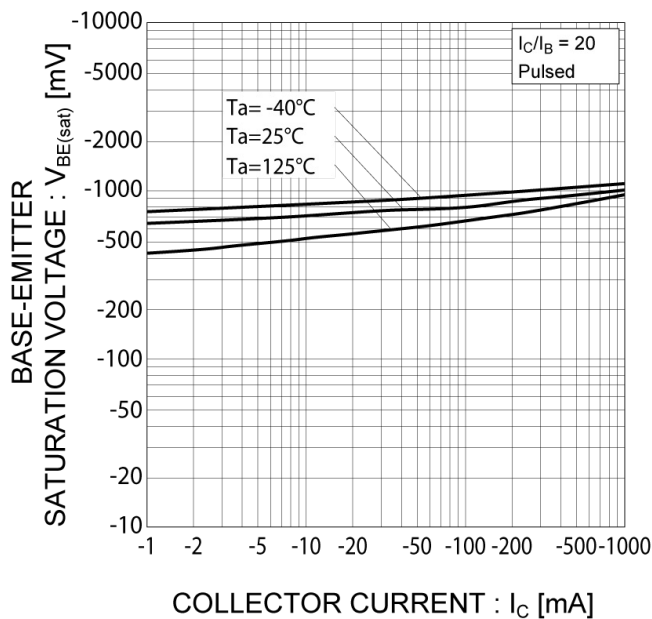
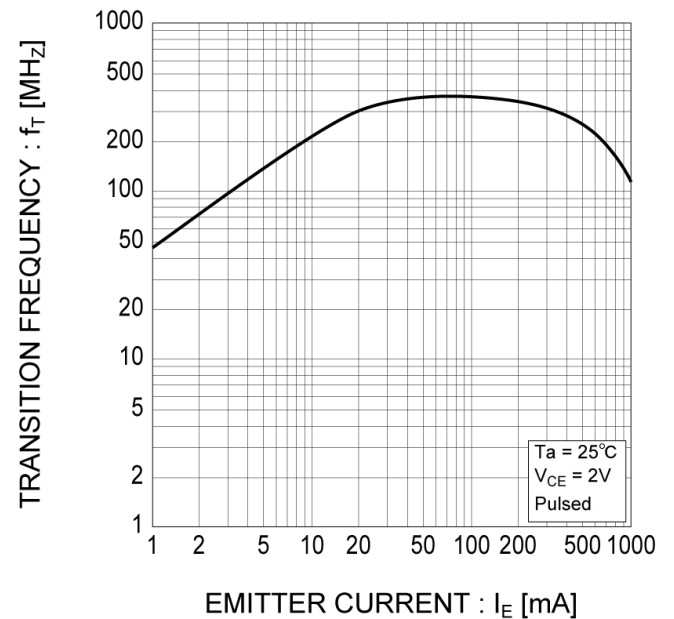


Fig.8 Gain Bandwidth Product vs.
Emitter Current



●Electrical characteristic curves($T_a=25^{\circ}\text{C}$) <For Tr1>

Fig.9 Emitter Input Capacitance vs.
Emitter-Base Voltage
Collector Output Capacitance vs.
Collector-Base Voltage

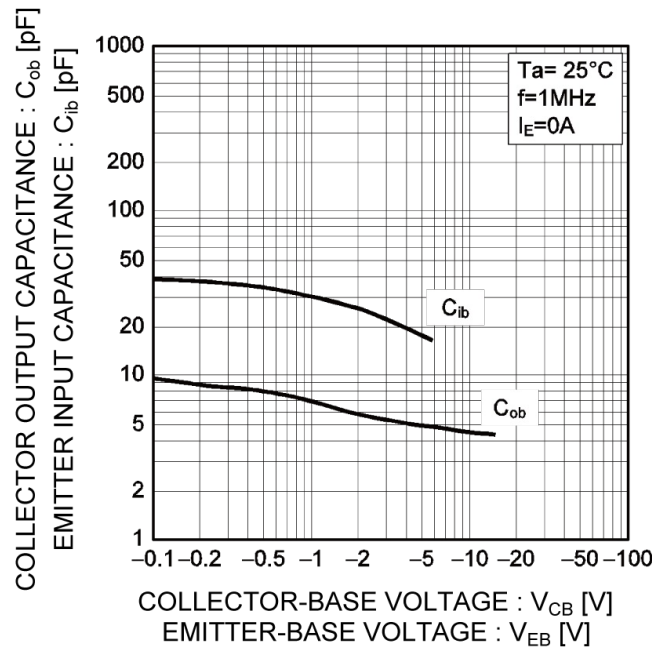
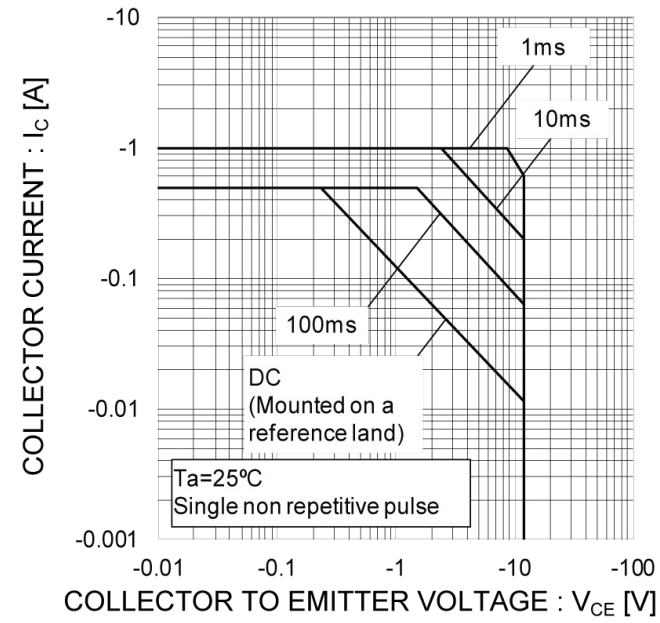


Fig.10 Safe Operating Area



●Electrical characteristic curves($T_a=25^\circ\text{C}$) <For DTr2>

Fig.11 Input voltage vs. output current (ON characteristics)

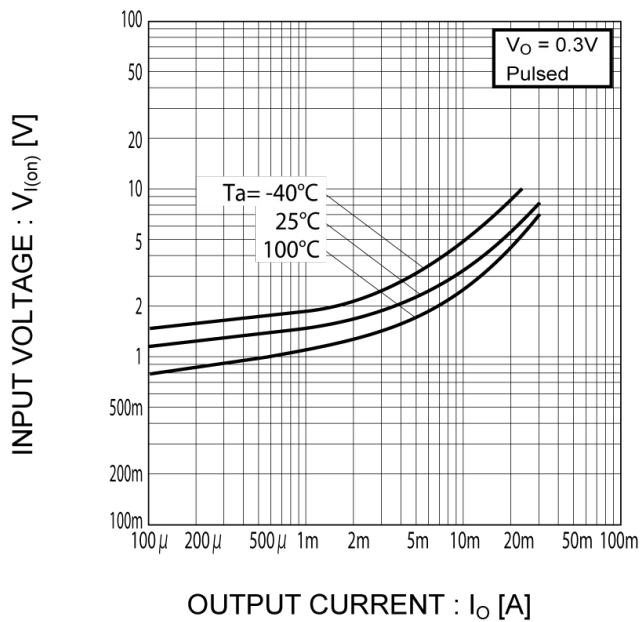


Fig.12 Output current vs. input voltage (OFF characteristics)

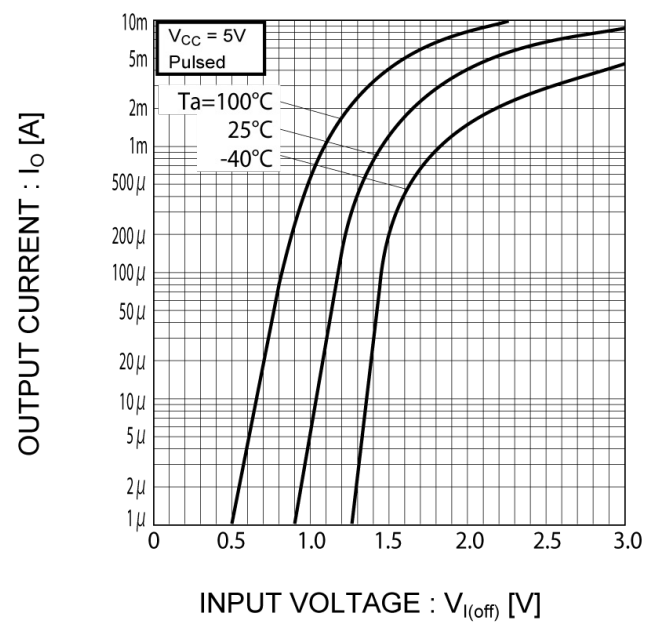


Fig.13 Output current vs. output voltage

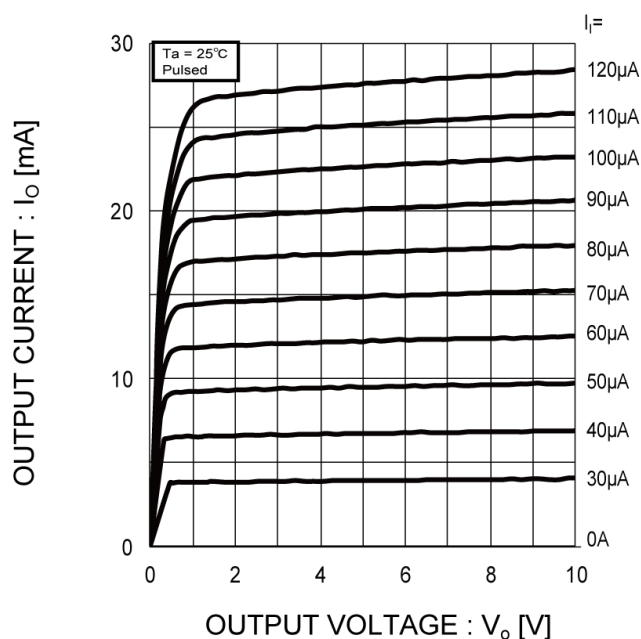
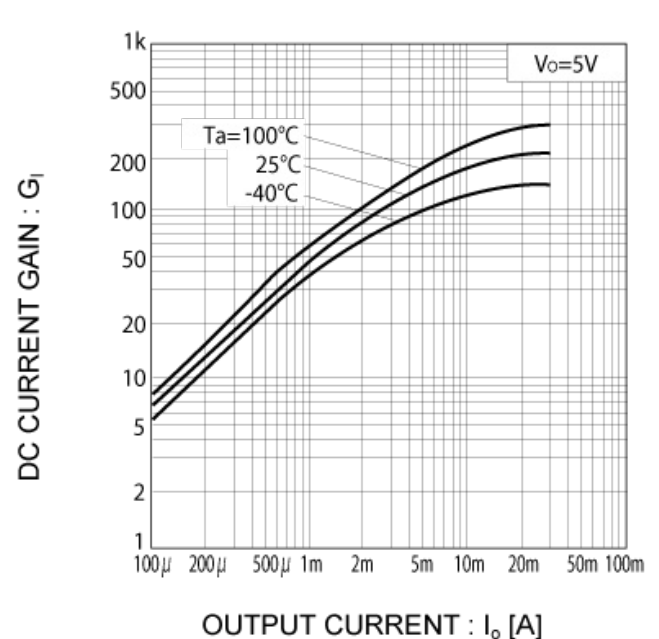
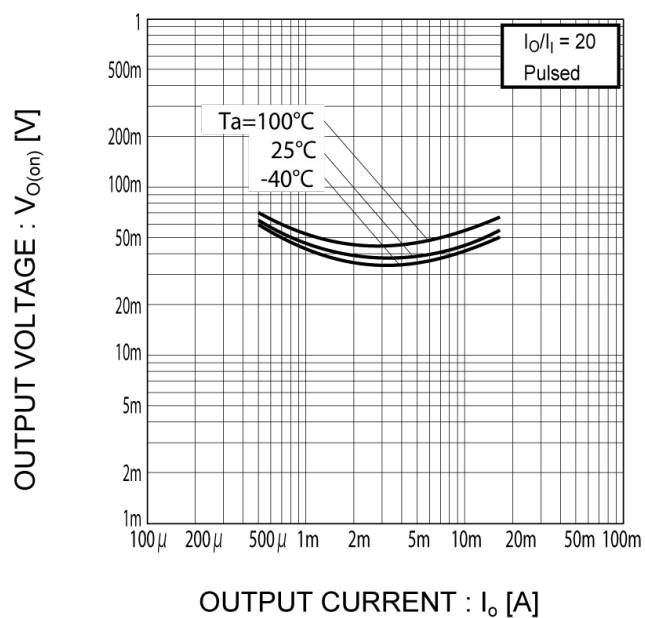


Fig.14 DC current gain vs. output current

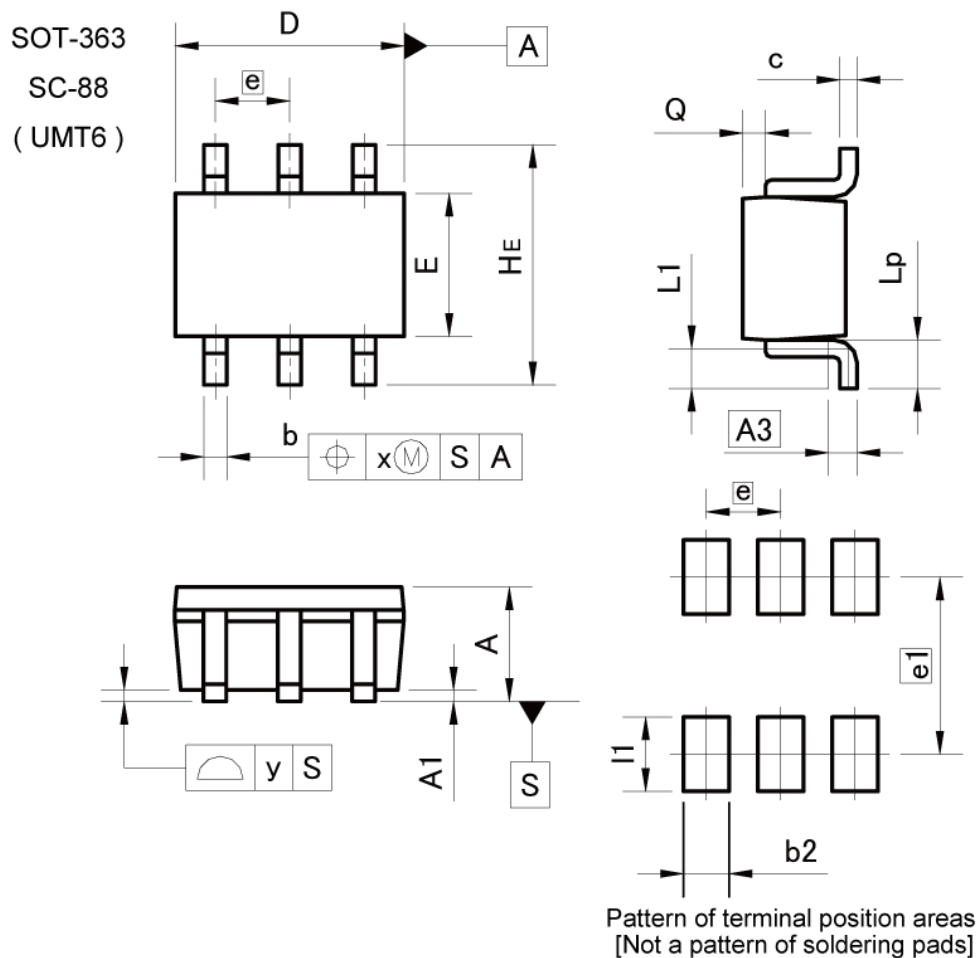


●Electrical characteristic curves($T_a=25^\circ\text{C}$) <For DTr2>

Fig.15 Output voltage vs. output current



●外形寸法図



DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.80	1.00	0.031	0.039
A1	0.00	0.10	0.000	0.004
A3	0.25		0.010	
b	0.15	0.30	0.006	0.012
c	0.10	0.20	0.004	0.008
D	1.90	2.10	0.075	0.083
E	1.15	1.35	0.045	0.053
e	0.65		0.026	
HE	2.00	2.20	0.079	0.087
L1	0.10	0.40	0.004	0.016
Lp	0.25	0.55	0.010	0.022
Q	0.10	0.30	0.004	0.012
x	—	0.10	—	0.004
y	—	0.10	—	0.004
DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b2	—	0.40	—	0.016
e1	1.55		0.061	
l1	—	0.65	—	0.026

Dimension in mm/inches