

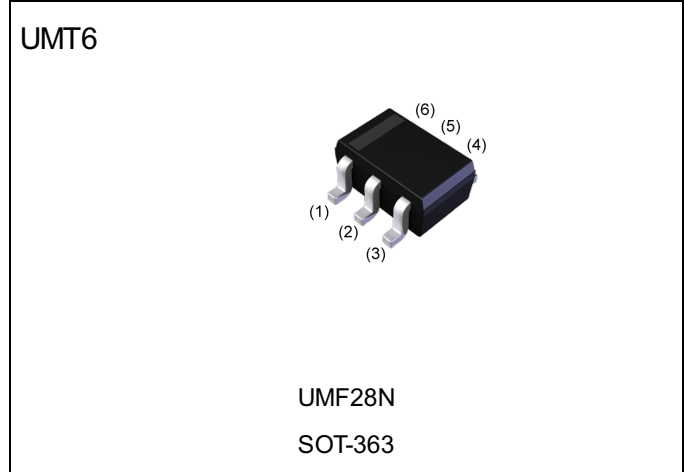
<For Tr1>

Parameter	Value
V_{CEO}	-50V
I_C	-150mA

<For DTr2>

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

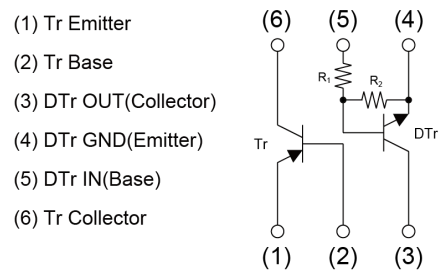
●Outline



●Features

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

●Inner circuit



●Application

Power manegement

●Packaging specifications

Part No.	Package	Package size	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit.(pcs)	Marking
UMF28N	UMT6	2021	TR	180	8	3000	F28

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

<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

<DTr2>

Parameter	Symbol	Limits	Unit
Supply voltage	V_{CC}	50	V
Input voltage	V_{IN}	-10 to 40	V
Output current	I_O	50	mA
Collector current	$I_{C(MAX)}^{*2}$	100	mA

<Tr1> <DTr2>

Parameter	Symbol	Limits	Unit
Power dissipation	P_D^{*1*3}	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°C) <For Tr1>

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Collector-base breakdown voltage	BV _{CBO}	I _C = -50μA	-60	-	-	V
Collector-emitter breakdown voltage	BV _{CEO}	I _C = -1mA	-50	-	-	V
Emitter-base breakdown voltage	BV _{EBO}	I _E = -50μA	-6	-	-	V
Collector cut-off current	I _{CBO}	V _{CB} = -60V	-	-	-100	nA
Emitter cut-off current	I _{EBO}	V _{EB} = -6V	-	-	-100	nA
Collector-emitter saturation voltage	V _{CE(sat)}	I _C = -50mA, I _B = -5mA	-	-	-500	mV
DC current gain	h _{FE}	V _{CE} = -6V, I _C = -1mA	180	-	390	-
Transition frequency	f _T	V _{CE} = -12V, I _E = 2mA, f = 100MHz	-	140	-	MHz
Output capacitance	C _{ob}	V _{CB} = -12V, I _E = 0mA, f = 1MHz	-	4.0	5.0	pF

●Electrical characteristics (T_a = 25°C) <For DTr2>

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input voltage	V _{I(off)}	V _{CC} = 5V, I _O = 100μA	-	-	0.4	V
	V _{I(on)}	V _O = 0.3V, I _O = 2mA	2.5	-	-	V
Output voltage	V _{O(on)}	I _O / I _I = 10mA / 0.5mA	-	100	300	mV
Input current	I _I	V _I = 5V	-	-	360	μA
Output current	I _{O(off)}	V _{CC} = 50V, V _I = 0V	-	-	500	nA
DC current gain	G _I	V _O = 5V, I _O = 5mA	68	-	-	-
Input resistance	R ₁	-	15.4	22	28.6	kΩ
Resistance ratio	R ₂ /R ₁	-	1.7	2.1	2.6	-
Transition frequency	f _T ^{*2}	V _{CE} = 10V, I _E = -5mA, f = 100MHz	-	250	-	MHz

*1 Each terminal mounted on a reference land.

*2 Characteristics of built-in transistor.

*3 120mW per element must not be exceeded.

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

Fig.1 Grounded emitter propagation characteristics

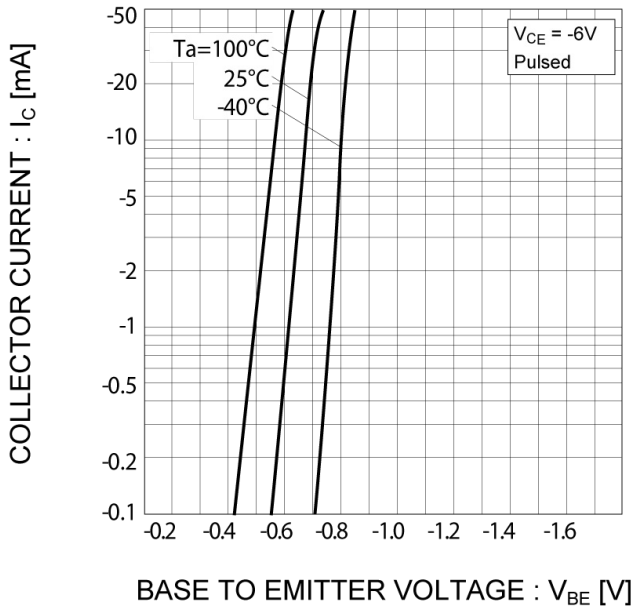


Fig.2 Grounded emitter output characteristics

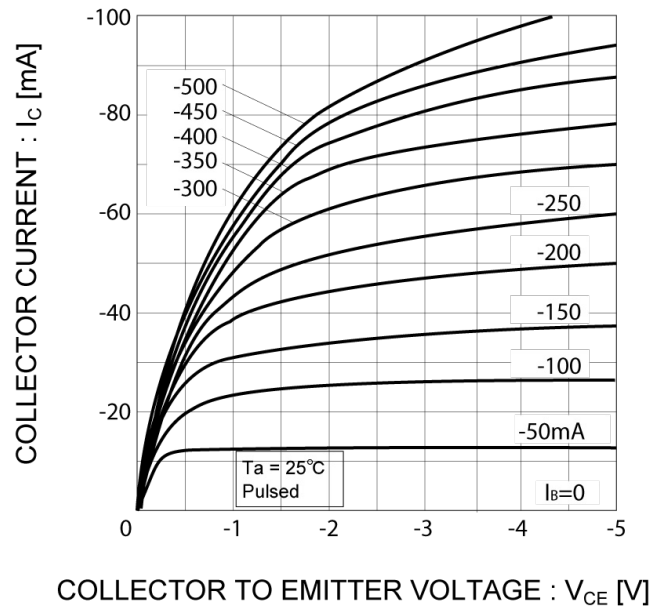


Fig.3 DC current gain vs. collector current (I)

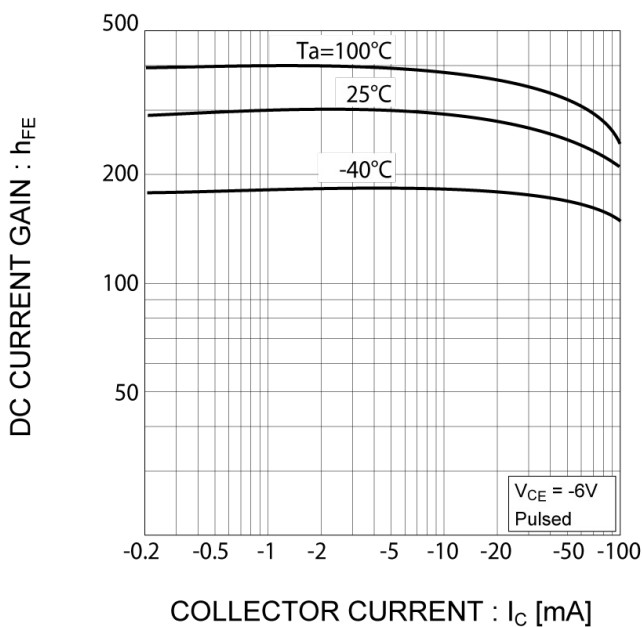
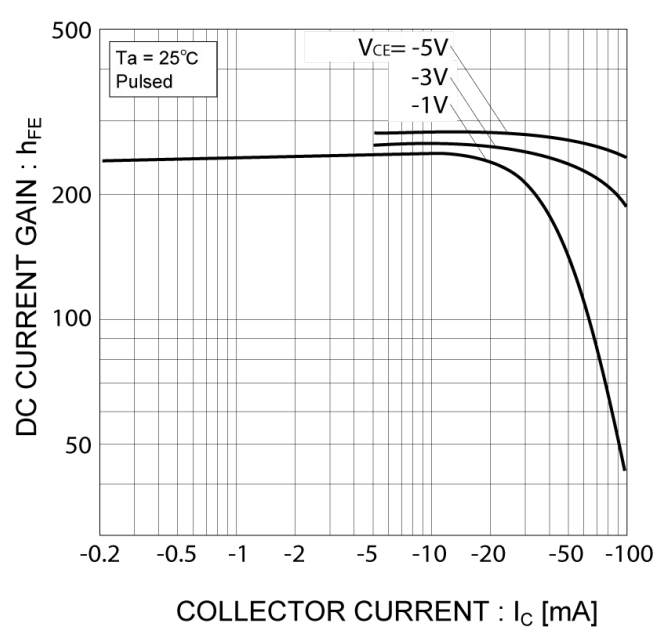


Fig.4 DC current gain vs. collector current (II)



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

Fig.5 Collector- emitter saturation voltage vs. collector current (I)

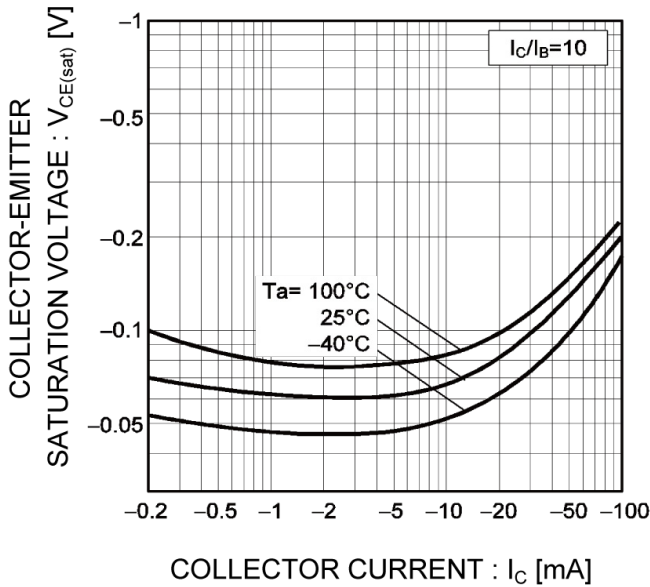


Fig.6 Collector- emitter saturation voltage vs. collector current (II)

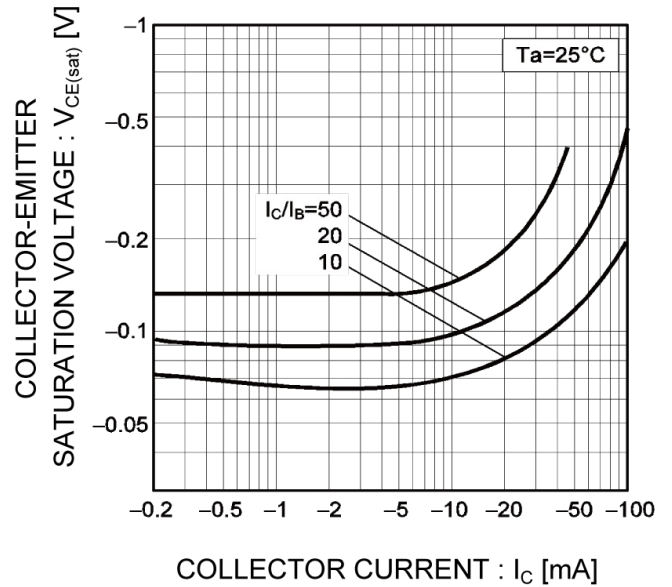


Fig.7 Base- emitter saturation voltage vs. collector current

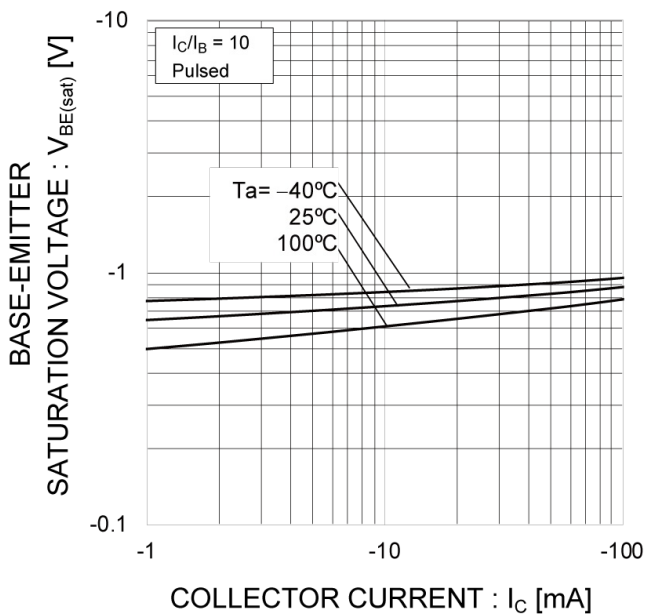
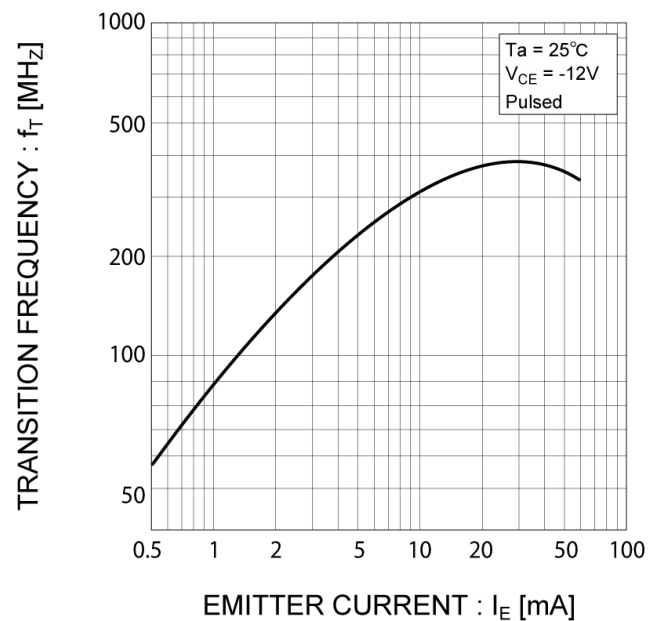
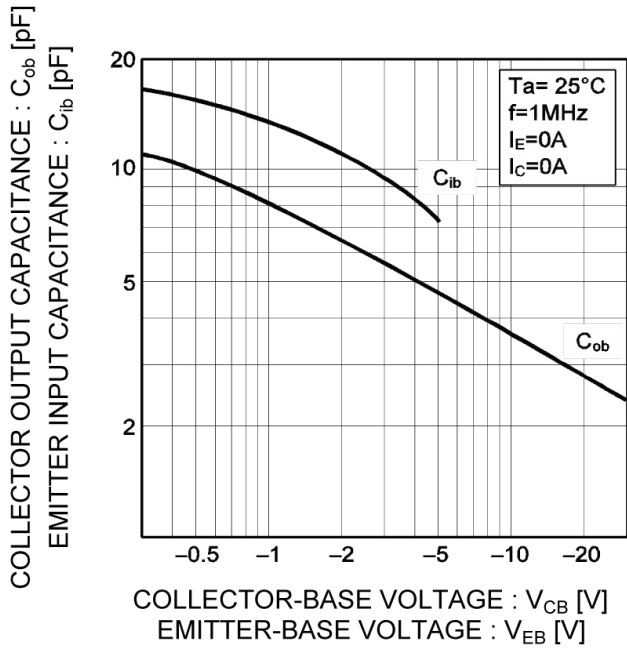


Fig.8 Gain bandwidth product vs. emitter current



● 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



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

Fig.1 Input Voltage vs. Output Current (ON Characteristics)

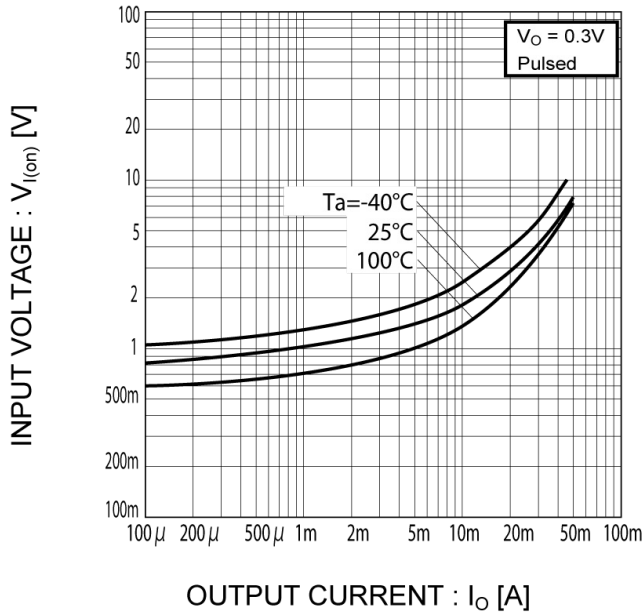


Fig.2 Output Current vs. Input Voltage (OFF Characteristics)

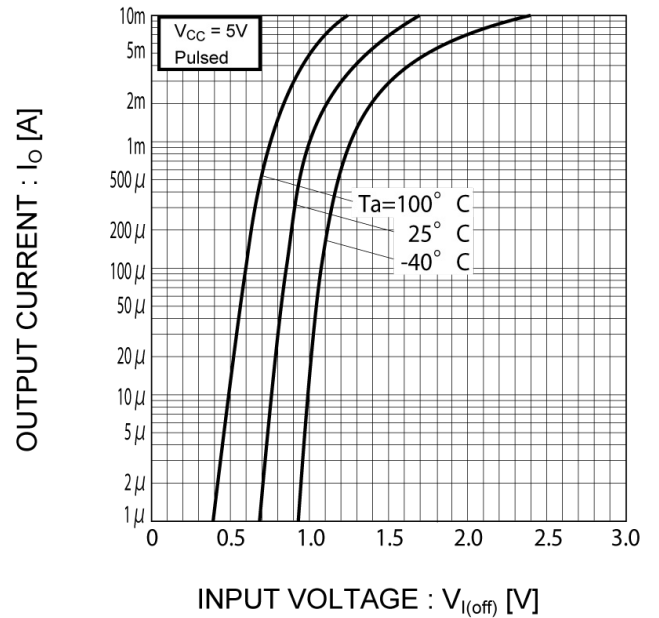


Fig.3 Output Current vs. Output Voltage

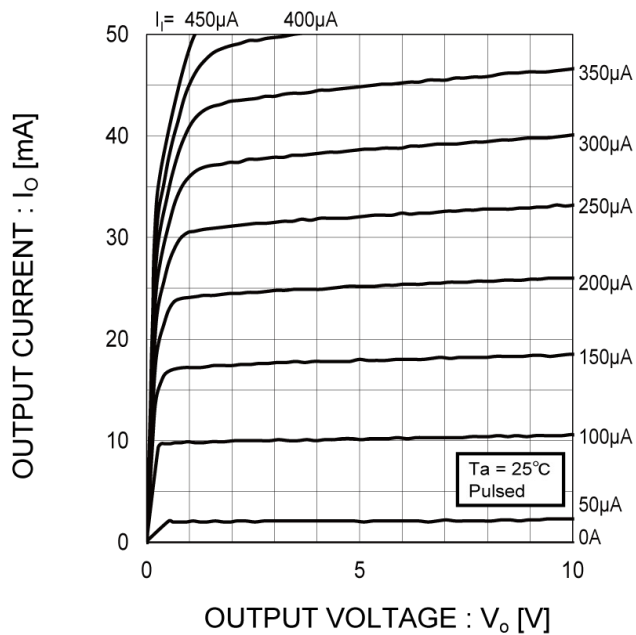
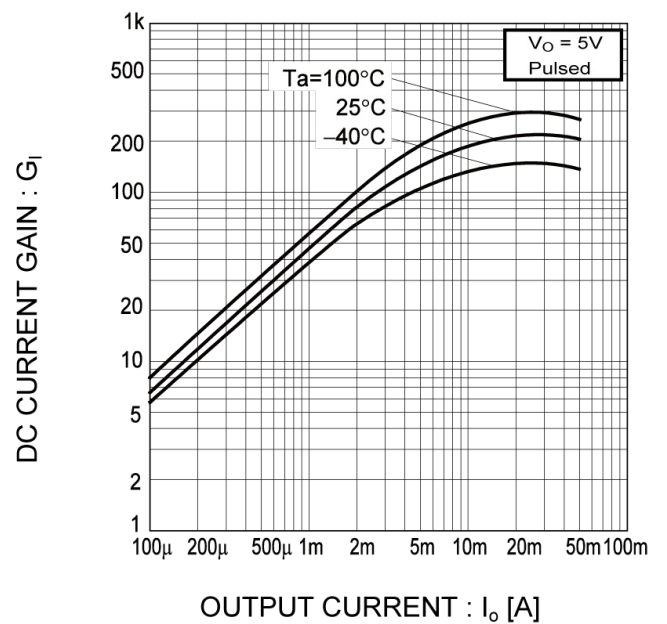
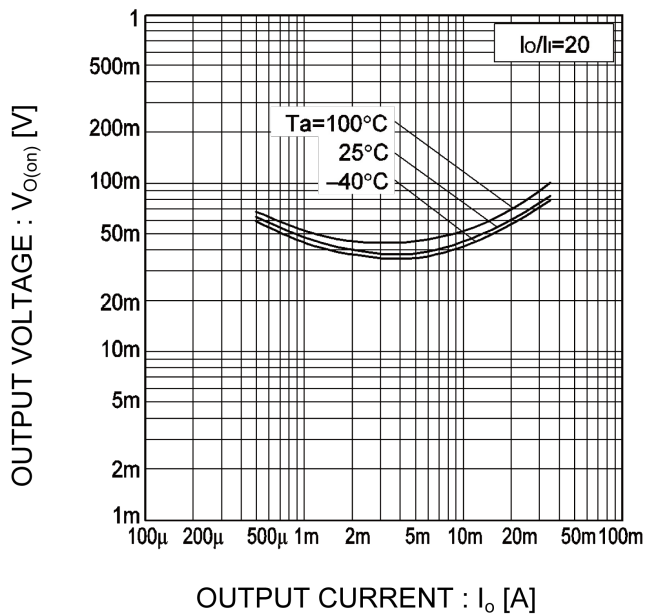


Fig.4 DC Current Gain vs. Output Current



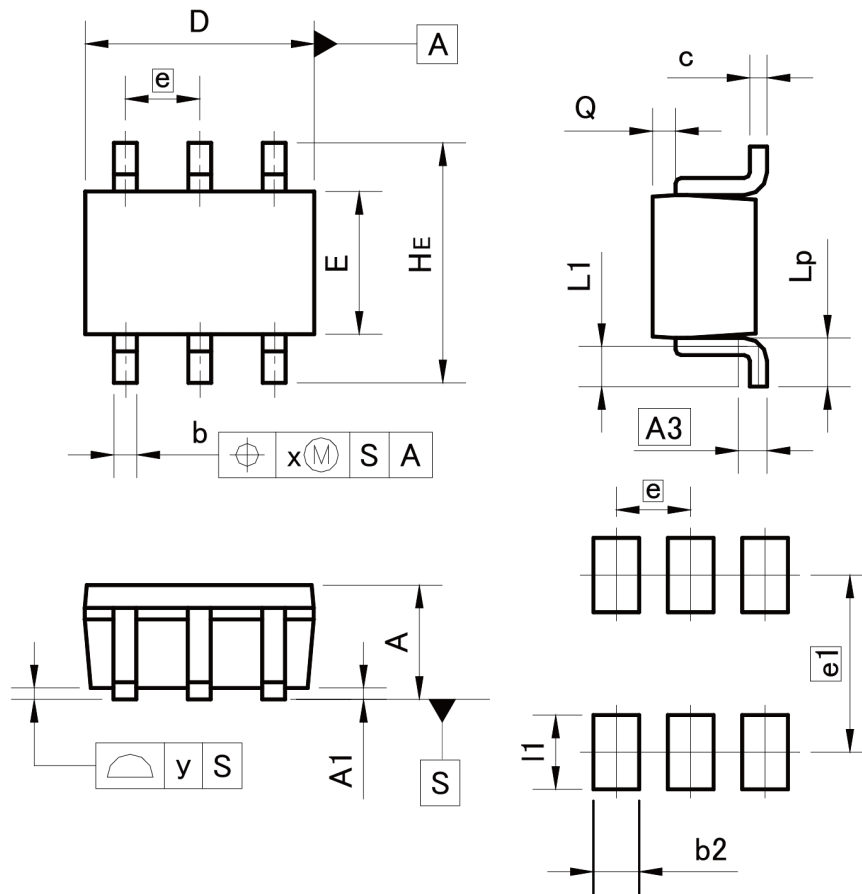
●Electrical characteristic curves($T_a=25^{\circ}\text{C}$) <For DTr2>

Fig.5 Output Voltage vs. Output Current



●外形寸法图

UMT6



Pattern of terminal position areas
[Not a recommended pattern of soldering pads]

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	0.20	0.50	0.008	0.020
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

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