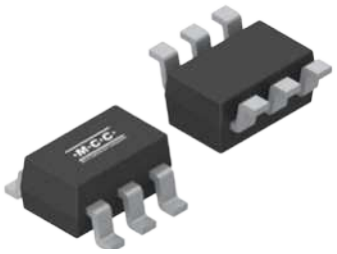
50V 100mA NPN/PNP Digital Transistor

Product Summary

Parameter	Rating	Unit
V_{CC}	50	V
I_O	100	mA
R_1	22	kΩ
R_2	22	kΩ



SOT-363

Features

- Built-in bias resistors
- Small surface mount package
- Simplifies circuit design and reduces component count

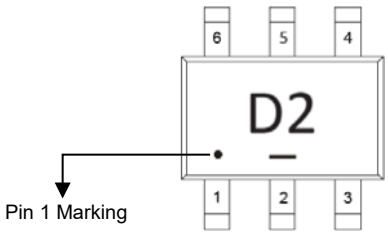
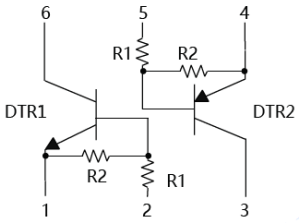
Applications

- Switching circuit
- Inverter circuit
- Interface circuit
- Driver circuit

Mechanical Data

- Package: SOT-363
- Moisture Sensitivity: Level 1, per J-STD-020
- Halogen Free. “Green” Device (Note1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Body Marking and Pin Layout

Marking Code	Internal Structure
	1 GND1(Emitter) 2 Input1(Base) 3 Output2(Collector) 4 GND2(Emitter) 5 Input2(Base) 6 Output1(Emitter) 

Underline(optional): Manufacturing Site Marking

Ordering Information

Product Name	Reel Size	Packing Type	Qty/Reel
UMD2N-TP	7”	Tape & Reel	3,000
UMD2N-TPQ2	7”	Tape & Reel	3,000

For packaging details, visit our website at https://www.mccsemi.com/Package/List

Maximum Ratings (T_J=25°C unless otherwise specified)

DTR1-NPN

Parameter	Symbol	Rating	Unit
Collect-Base Voltage	V_{CBO}	50	V
Collect-Emitter Voltage	V_{CEO}	50	V
Emitter-Base Voltage	V_{EBO}	10	V
Supply Voltage	V_{CC}	50	V
Input Voltage	V_{IN}	-10 to +40	V
Output Current	I_O	100	mA
Power Dissipation (Note 2)	P_D	150	mW
Operating Junction Temperature Range	T_J	-55 to +150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

DTR2-PNP

Parameter	Symbol	Rating	Unit
Collect-Base Voltage	V_{CBO}	-50	V
Collect-Emitter Voltage	V_{CEO}	-50	V
Emitter-Base Voltage	V_{EBO}	-10	V
Supply Voltage	V_{CC}	-50	V
Input Voltage	V_{IN}	-40 to +10	V
Output Current	I_O	-100	mA
Power Dissipation (Note 2)	P_D	150	mW
Operating Junction Temperature Range	T_J	-55 to +150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

Thermal Characteristics

Parameter	Symbol	Rating	Unit
Thermal Resistance from Junction to Ambient (Note 2)	$R_{\theta JA}$	833	°C/W

Note:
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and 1000ppm antimony compounds.
2. Device mounted on 25.4mm x 25.4mm x 1.5mm FR4 PCB with high coverage of single sided 1 oz copper and standard footprint in a still air environment with T_A =25°C.

Electrical Characteristics (T_A=25°C unless otherwise specified)

DTR1-NPN

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Voltage	$V_{I(OFF)}$	V_{CC}=5V, I_O=100μA			0.5	V
	$V_{I(ON)}$	V_O=0.2V, I_O=5mA	3.0			V
Output Voltage	$V_{O(ON)}$	I_O=10mA, I_I=0.5mA			0.3	V
Input Current	I_I	V_I=5V			0.36	mA
Output Current	$I_{O(OFF)}$	V_{CC}=50V, V_I= 0			0.5	μA
DC Current Gain (Note3)	G_I	V_O=5V, I_O=5mA	56			
Input Resistance	R_1		15.4	22	28.6	kΩ
Resistance Ratio	R_2/R_1		0.8	1.0	1.2	
Transition Frequency (Note3)	f_T	V_{CE}=10V, I_E=-5mA, f=100MHz		250		MHz

DTR2-PNP

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Voltage	$V_{I(OFF)}$	V_{CC}=-5V, I_O= -100μA			-0.5	V
	$V_{I(ON)}$	V_O=-0.2V, I_O= -5mA	-3.0			V
Output Voltage	$V_{O(ON)}$	I_O=-10mA, I_I=-0.5mA			-0.3	V
Input Current	I_I	V_I=-5V			-0.36	mA
Output Current	$I_{O(OFF)}$	V_{CC}=-50V, V_I= 0			-0.5	μA
DC Current Gain	G_I	V_O=-5V, I_O= -5mA	56			
Input Resistance	R_1		15.4	22	28.6	kΩ
Resistance Ratio	R_2/R_1		0.8	1.0	1.2	
Transition Frequency	f_T	V_{CE}=-10V, I_E= 5mA, f=100MHz		250		MHz

Curve Characteristics

DTR1-NPN

Fig.1 –DC Current Gain Characteristics

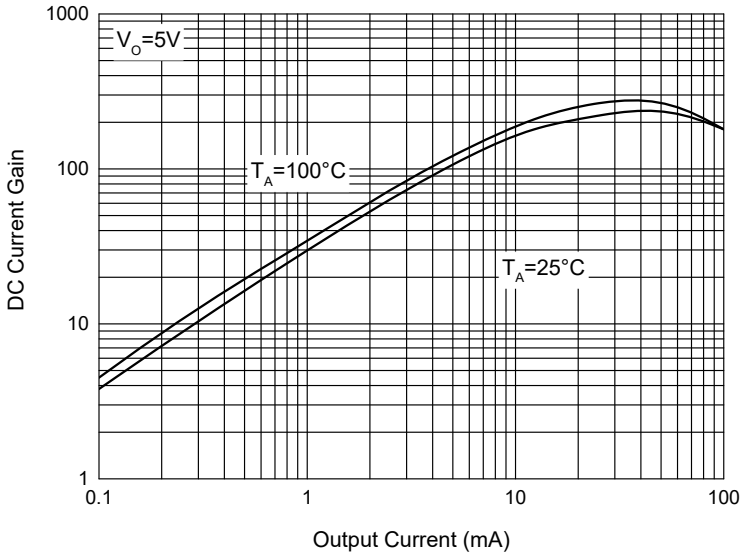


Fig.2 –Input Voltage (on) Characteristics

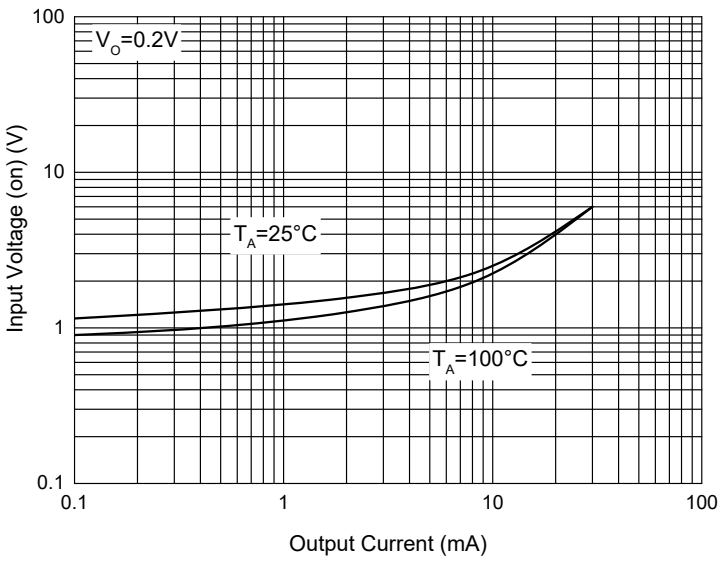


Fig.3 –Input Voltage (off) Voltage Characteristics

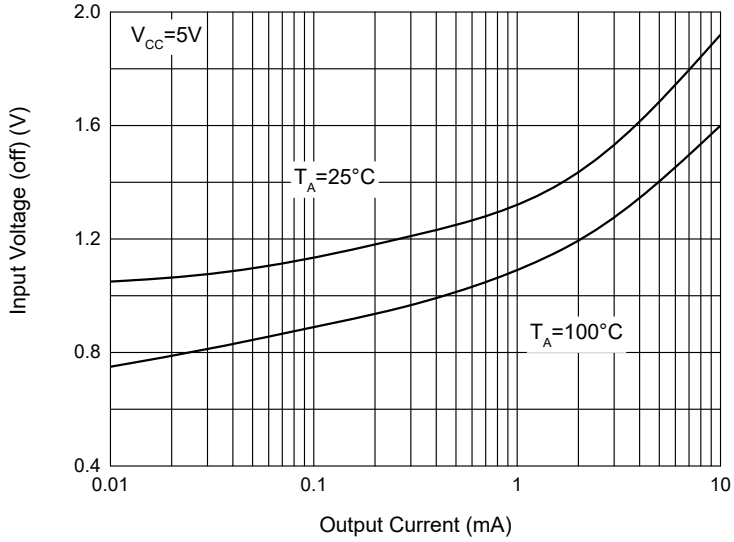


Fig.4 –Output Voltage Characteristics

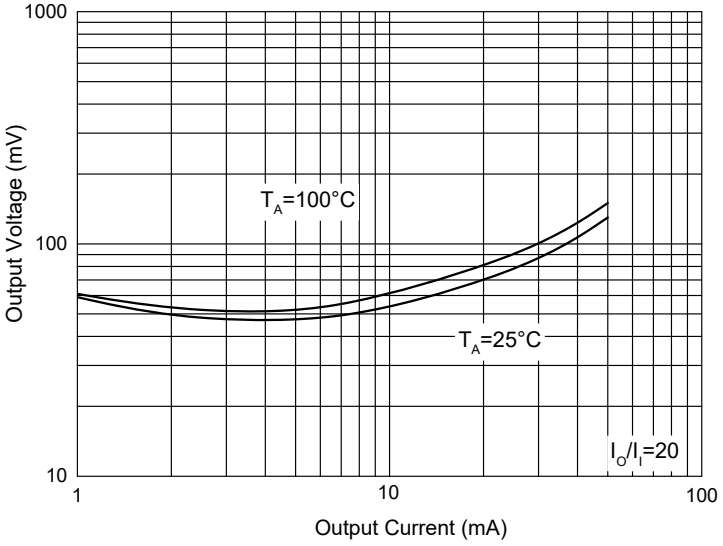
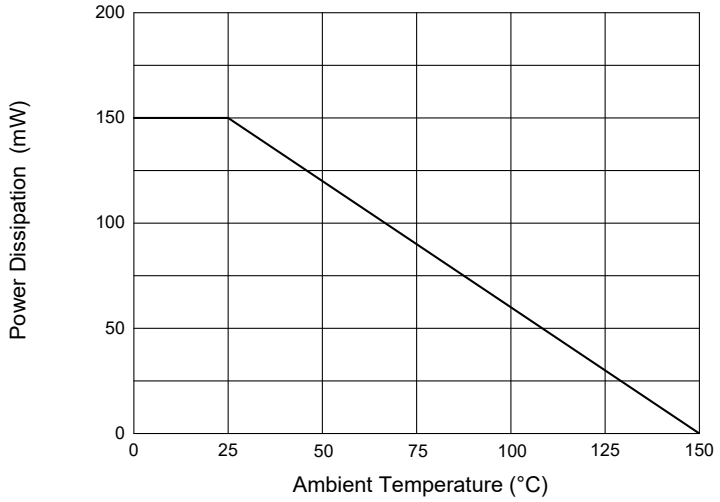


Fig.5 –Power Derating Curve



Curve Characteristics

DTR2-PNP

Fig.1 –DC Current Gain Characteristics

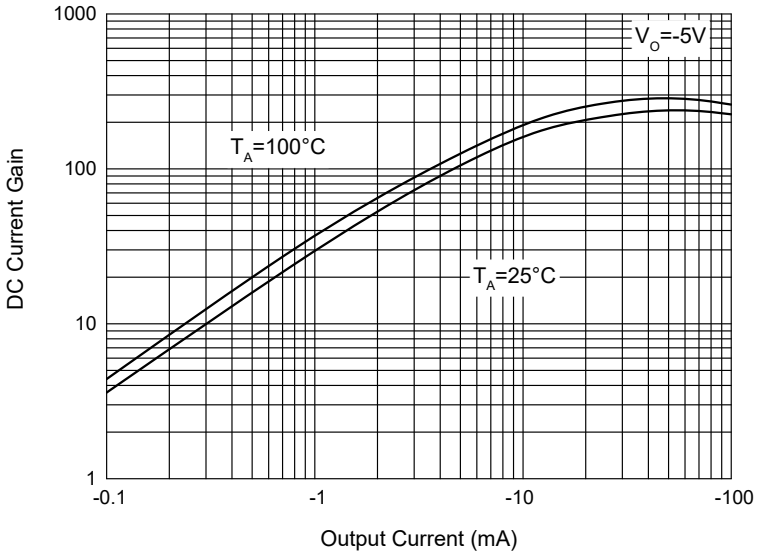


Fig.2 –Input Voltage (on) Characteristics

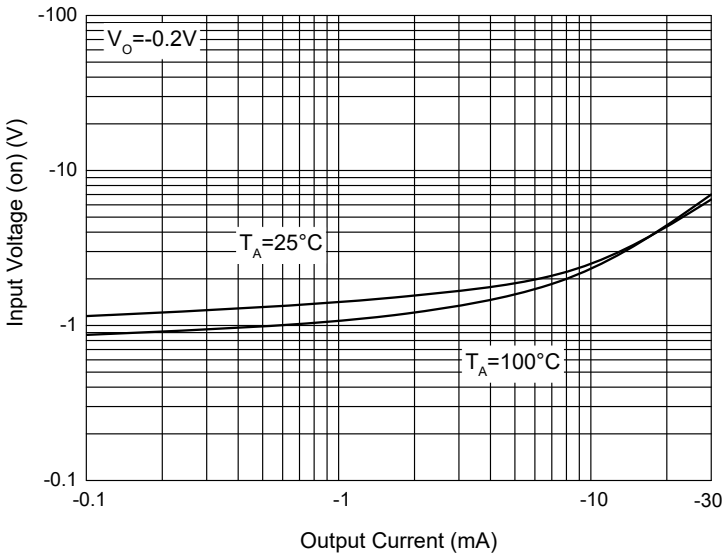


Fig.3 –Input Voltage (off) Voltage Characteristics

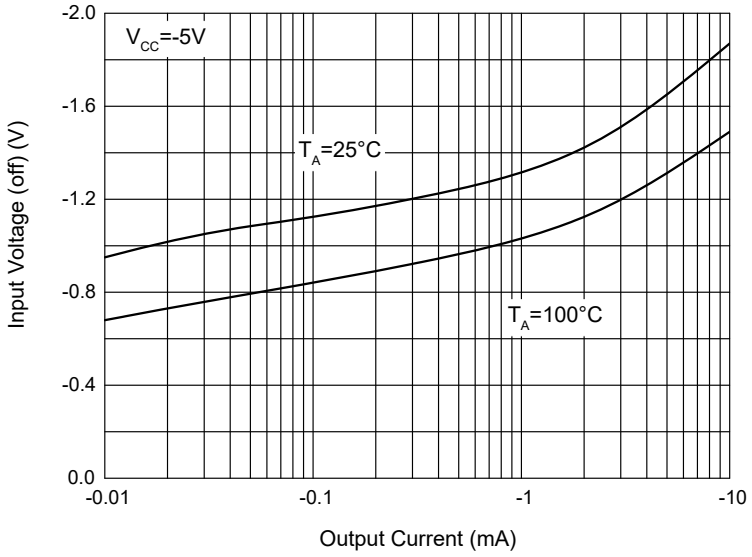


Fig.4 –Output Voltage Characteristics

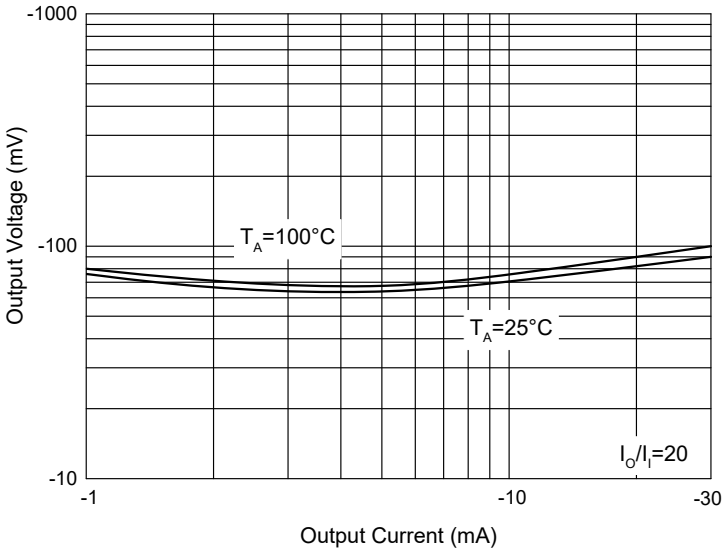
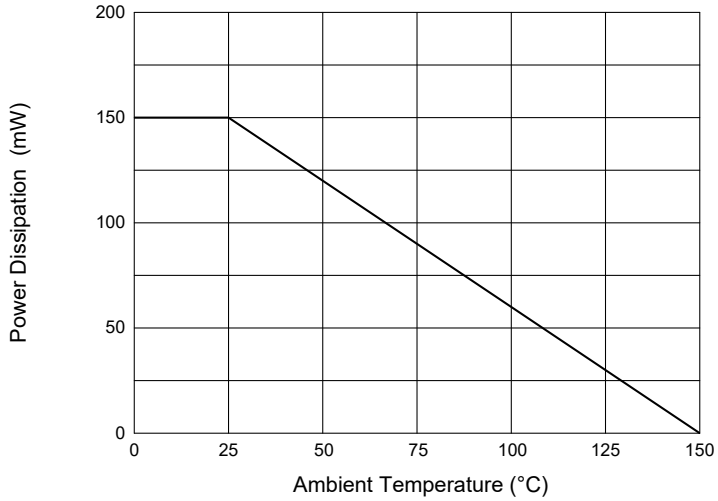
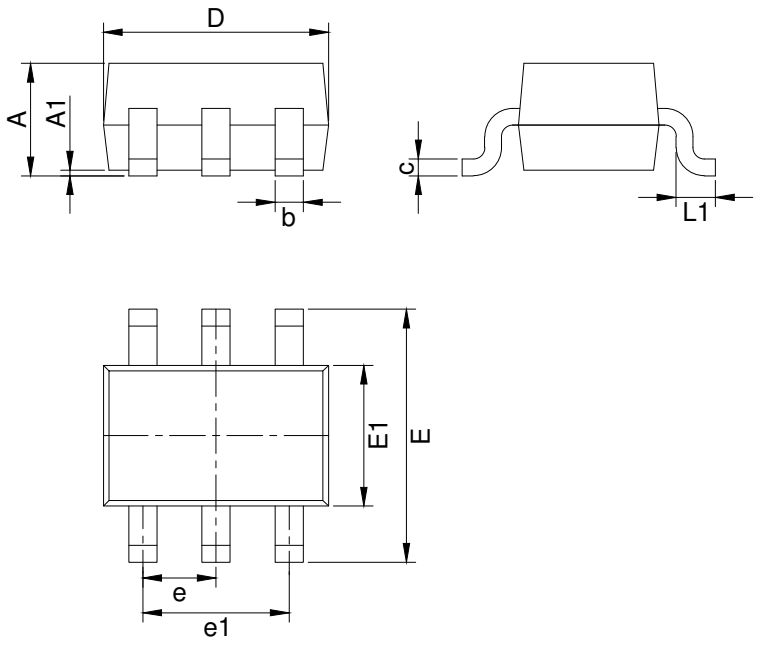


Fig.5 –Power Derating Curve

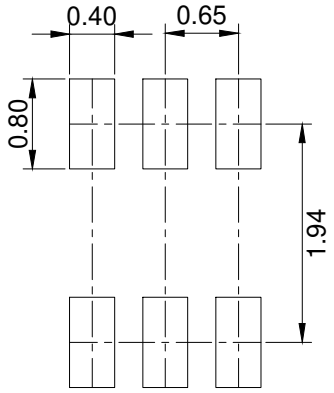


Package Outline



DIM	INCH		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.031	0.047	0.80	1.20	
A1	0.000	0.004	0.00	0.10	
b	0.006	0.014	0.15	0.35	
c	0.002	0.010	0.05	0.25	
D	0.071	0.087	1.80	2.20	
E	0.079	0.096	2.00	2.45	
E1	0.045	0.053	1.15	1.35	
e	0.026		0.65		TYP
e1	0.051		1.30		TYP
L1	0.010	0.018	0.25	0.46	

Suggested Pad Layout (Unit:mm)



Notes:

1. The suggested land pattern dimensions have been provided for reference only.
2. For further information, please refer to document IPC-7351A.

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