FMUN5111DW-Q1 Thru FMUN5135DW-Q1

List

FMUN5111DW-Q1 Thru FMUN5135DW-Q1

PNP Silicon Surface Mount Transistors with Monolithic Bias Resistor Network

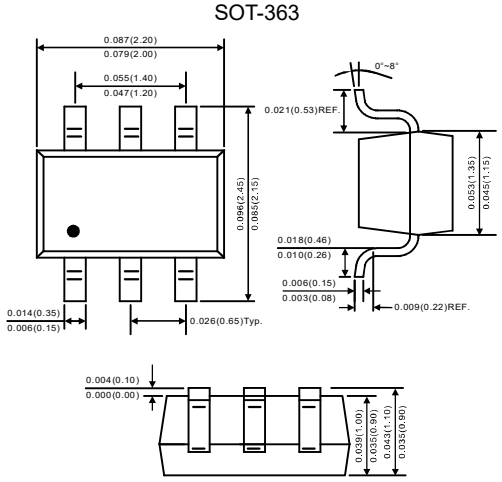
Features

- Simplifies circuit design.
- Reduces Board Space.
- Reduces Component Count.
- We declare that the material of product compliance with RoHs require.
- -Q1 for automotive and other applications requiring unique site and control change requirements; AEC-Q101 qualified and PPAP capable.
- Suffix "-H" indicates Halogen free parts, ex. FMUN5211DW-Q1-H.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, SOT-363
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Mounting Position : Any

Package outline



Dimensions in inches and (millimeters)

Maximum ratings (At T_A=25°C unless otherwise noted, Common for Q_1 and Q_2)

Parameter	Symbol	Value	Unit
Collector base voltage	$-V_{CBO}$	50	V
Collector to emitter voltage	$-V_{CEO}$	50	V
Collector current	$-I_C$	100	mA
Power dissipation (Note1)	P_D	200	mW
Junction temperature	T_j	150	℃
Storage temperature range	T_{stg}	-55 to +150	℃
Thermal resistance junction to ambient (Note 1)	$R_{\theta JA}$	493	℃/W
Thermal resistance junction to lead (Note 1)	$R_{\theta JL}$	188	℃/W

Note : 1. FR-4 @Minimum pad

Electrical characteristics (T_A=25℃ uless otherwise noted, common for Q1 and Q2)(Continued)

Parameter	Conditions	Symbol	Device	Min.	Typ.	Max.	Unit
DC Current gain	$-V_{CE}$ =10V, $-I_C$ = 5mA	h_{FE}	FMUN5111DW-Q1	35	60	250	
			FMUN5112DW-Q1	60	100		
			FMUN5113DW-Q1	80	140		
			FMUN5114DW-Q1	80	140		
			FMUN5115DW-Q1	160	250		
			FMUN5116DW-Q1	160	250		
			FMUN5130DW-Q1	3	5		
			FMUN5131DW-Q1	8	15		
			FMUN5132DW-Q1	15	27		
			FMUN5133DW-Q1	80	140		
			FMUN5134DW-Q1	80	130		
			FMUN5135DW-Q1	80	140		

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Electrical characteristics (At T_A=25°C unless otherwise noted, Common for Q_1 and Q_2) (Continued)

Parameter	Conditions	Device	Symbol	Min.	Typ.	Max.	Unit
Collector base breakdown voltage	$-I_C$=10μA, I_E=0		$-V_{(BR)CBO}$	50			V
Collector emitter breakdown voltage	$-I_C$=2mA, I_B=0		$-V_{(BR)CEO}$	50			V
Collector base cut off current	$-V_{CB}$=50V, I_E=0		$-I_{CBO}$			100	nA
Collector emitter cut off current	$-V_{CE}$=50V, I_B=0		$-I_{CEO}$			500	nA
Emitter base cut off current	$-V_{EB}$=6V	FMUN5111DW-Q1	$-I_{EBO}$			0.5	mA
		FMUN5112DW-Q1				0.2	
		FMUN5113DW-Q1				0.1	
		FMUN5114DW-Q1				0.2	
		FMUN5115DW-Q1				0.9	
		FMUN5116DW-Q1				1.9	
		FMUN5130DW-Q1				4.3	
		FMUN5131DW-Q1				2.3	
		FMUN5132DW-Q1				1.5	
		FMUN5133DW-Q1				0.18	
		FMUN5134DW-Q1				0.13	
		FMUN5135DW-Q1				0.2	
Collector emitter saturation voltage	$-I_C$=10mA, $-I_B$=0.3mA		$-V_{CE(sat)}$			0.25	V
	$-I_C$=10mA, $-I_B$=5mA	FMUN5130DW-Q1					
		FMUN5131DW-Q1					
	$-I_C$=10mA, $-I_B$=1mA	FMUN5132DW-Q1					
		FMUN5134DW-Q1					
Output voltage (on)	$-V_{CC}$=5V, $-V_B$=2.5V, R_L=1KΩ		$-V_{OL}$			0.2	V
	$-V_{CC}$=5V, $-V_B$=3.5V, R_L=1KΩ	FMUN5213DW-Q1					
Output voltage (off)	$-V_{CC}$=5V, $-V_B$=0.5V, R_L=1KΩ		$-V_{OH}$	4.9			V
	$-V_{CC}$=5V, $-V_B$=0.05V, R_L=1KΩ	FMUN5230DW-Q1					
	$-V_{CC}$=5V, $-V_B$=0.25V, R_L=1KΩ	FMUN5115DW-Q1					
		FMUN5116DW-Q1					
		FMUN5231DW-Q1					
		FMUN5232DW-Q1					

Note : Pulse Test : Pulse Width < 300 μs, Duty Cycle < 2.0%

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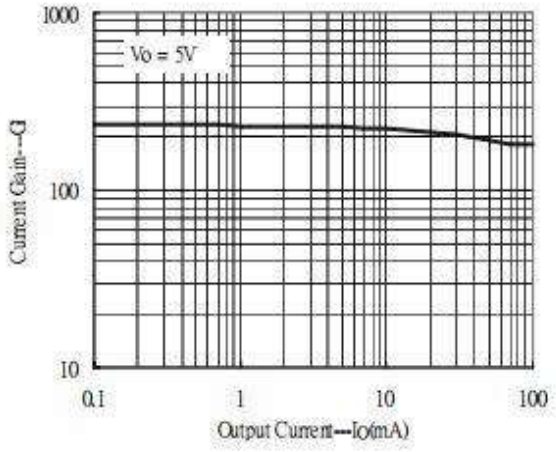
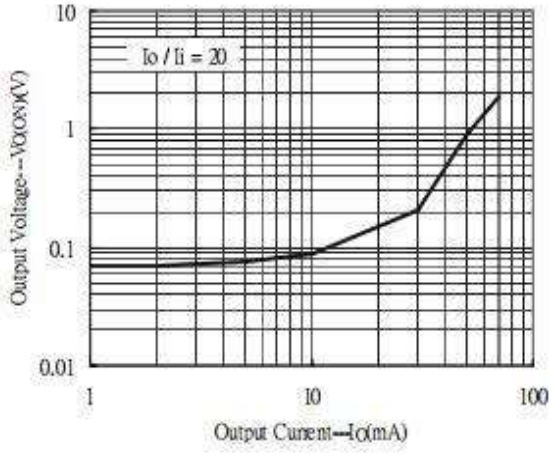
Rating and characteristic curves

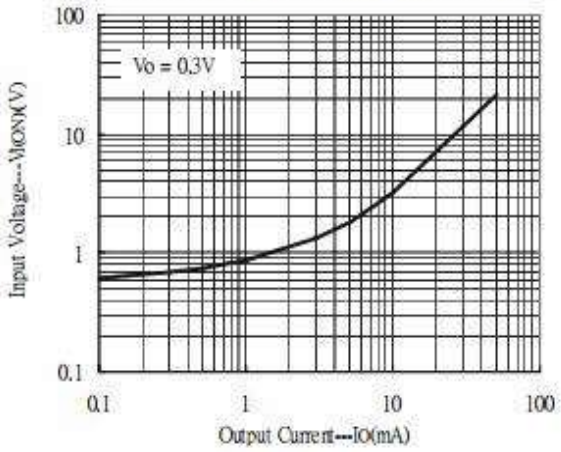
Current Gain vs Output Current



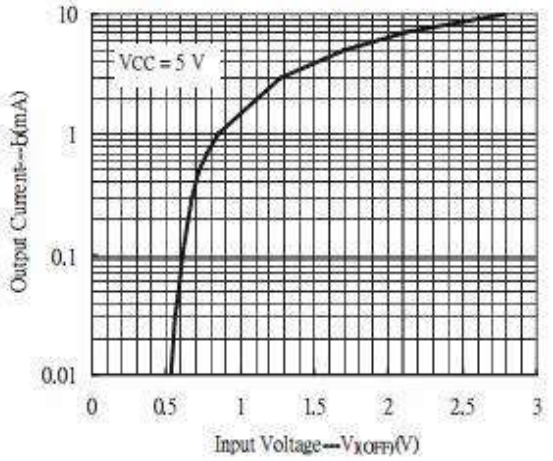
Output Voltage vs Output Current



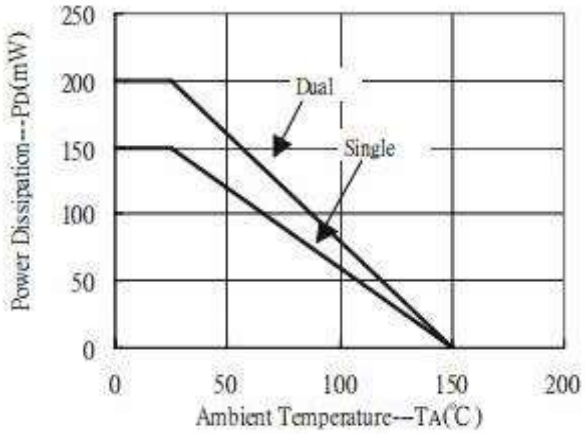
Input Voltage vs Output Current(ON characteristics)



Output Current vs Input Voltage(OFF characteristics)



Power Derating Curves



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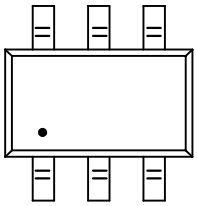
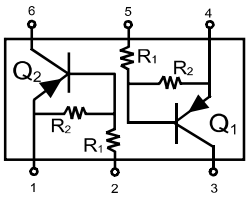
Pinning information

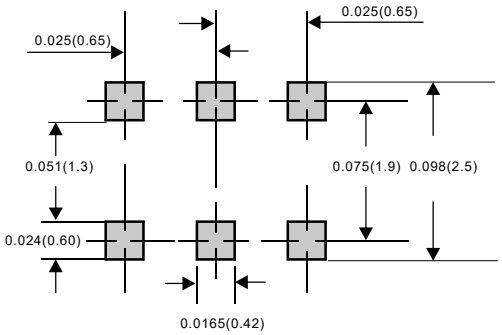
Pin	Simplified outline	Symbol
Pin2, 5 Base Pin1, 4 Emitter Pin3, 6 Collector		

Device marking, Resistor values and ordering information

Device	Marking	Input resistor R_1(KΩ)			R_2(KΩ)	Resistor ratio R_1 / R_2		
		Min	Normal	Max		Min	Normal	Max
FMUN5111DW-Q1	0A	7	10	13	10	0.8	1.0	1.2
FMUN5112DW-Q1	0B	15.4	22	28.6	22	0.8	1.0	1.2
FMUN5113DW-Q1	0C	32.9	47	61.1	47	0.8	1.0	1.2
FMUN5114DW-Q1	0D	7	10	13	47	0.17	0.21	0.25
FMUN5115DW-Q1	0E	7	10	13	–	–	–	–
FMUN5116DW-Q1	0F	3.3	4.7	6.1	–	–	–	–
FMUN5130DW-Q1	0G	0.7	1	1.3	1	0.8	1.0	1.2
FMUN5131DW-Q1	0H	1.5	2.2	2.9	2.2	0.8	1.0	1.2
FMUN5132DW-Q1	0J	3.3	4.7	6.1	4.7	0.8	1.0	1.2
FMUN5133DW-Q1	0K	3.3	4.7	6.1	47	0.055	0.1	0.185
FMUN5134DW-Q1	0L	15.4	22	28.6	47	0.38	0.47	0.56
FMUN5135DW-Q1	0M	1.54	2.2	2.86	47	0.038	0.047	0.056

Suggested solder pad layout

SOT-363



Dimensions in inches and (millimeters)

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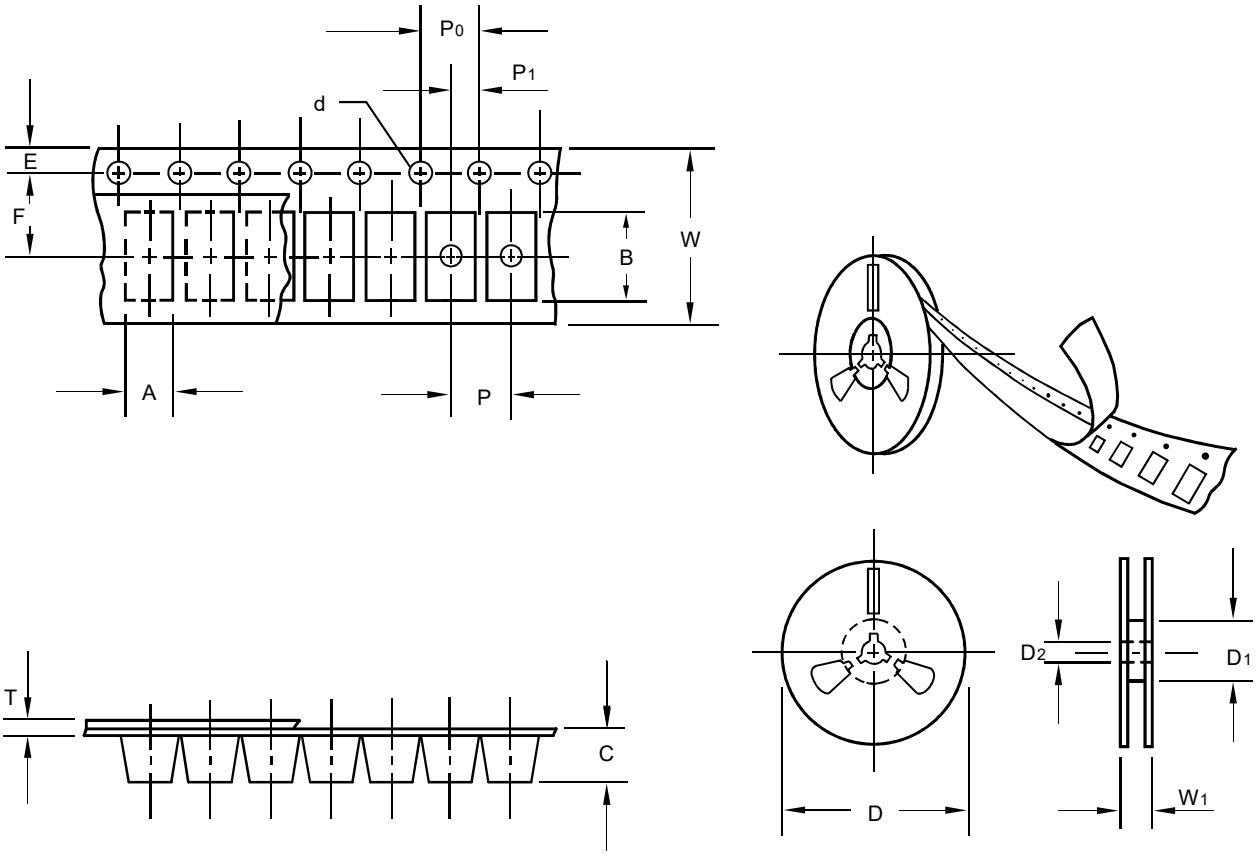
Packing information



unit:mm

Item	Symbol	Tolerance	SOT-363
Carrier width	A	0.1	2.36
Carrier length	B	0.1	2.40
Carrier depth	C	0.1	1.20
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D_1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D_1	min	62.00
Feed hole diameter	D_2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	4.00
Sprocket hole pitch	P_0	0.1	4.00
Embossment center	P_1	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W_1	1.0	11.40

Note:Devices are packed in accor dance with EIA standar RS-481-A and specifications listed above.

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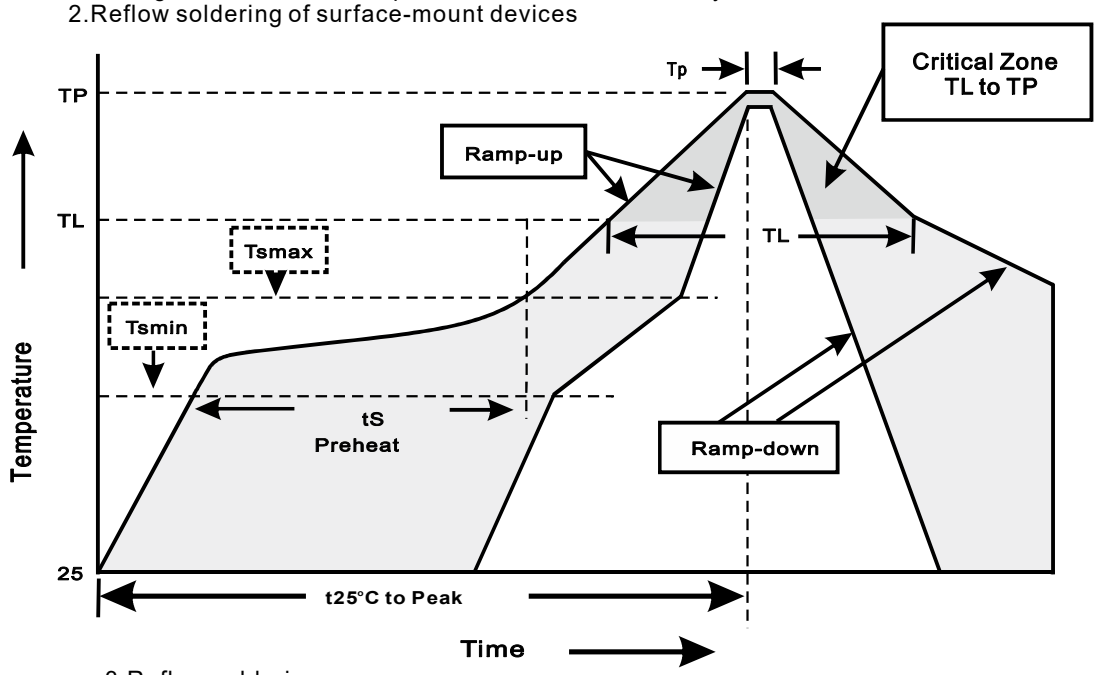
Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)	APPROX. GROSS WEIGHT (kg)
SOT-363	7"	3,000	4.0	30,000	183*183*123	178	382*262*387	240,000	9.50

Suggested thermal profiles for soldering processes

1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
2.Reflow soldering of surface-mount devices



3.Reflow soldering

Profile Feature	Soldering Condition
Average ramp-up rate(T_L to T_P)	<3°C/sec
Preheat -Temperature Min(Tsmin) -Temperature Max(Tsmax) -Time(min to max)(t_s)	 150°C 200°C 60~120sec
Tsmax to T_L -Ramp-upRate	 <3°C/sec
Time maintained above: -Temperature(T_L) -Time(t_L)	 217°C 60~260sec
Peak Temperature(T_P)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t_P)	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes