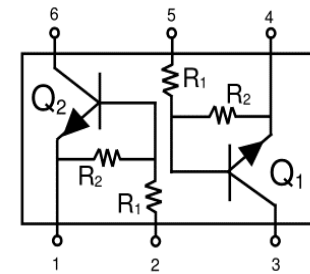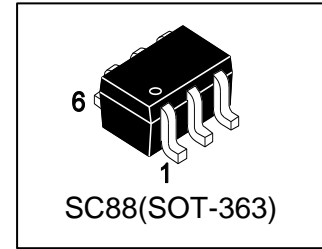# LMUN5213DW1T1G
S-LMUN5213DW1T1G

Dual Bias ResistorTransistors
NPN Silicon Surface Mount Transistors
with Monolithic Bias Resistor Network

SC88(SOT-363)

1. FEATURES

- Simplifies circuit design
- Reduces board space.
- Reduces Component Count
- We declare that the material of product compliance with RoHS requirements and Halogen Free.
- S- prefix for automotive and other applications requiring unique site and control change requirements; AEC-Q101 qualified and PPAP capable.

2. DEVICE MARKING AND RESISTOR VALUES

Device	Marking	R1(K)	R2(K)	Shipping
LMUN5213DW1T1G	7C	47	47	3000/Tape&Reel
LMUN5213DW1T3G	7C	47	47	10000/Tape&Reel

3. MAXIMUM RATINGS(Ta = 25ºC)

Parameter	Symbol	Limits	Unit
Collector–Emitter Voltage	VCEO	50	V
Collector–Base Voltage	VCBO	50	V
Emitter–Base Breakdown Voltage	VEBO	6	V
Collector Current — Continuous	IC	100	mA

4. THERMAL CHARACTERISTICS

Parameter (One Junction Heated)	Symbol	Limits	Unit
Total Device Dissipation, (Note 1) @ TA = 25ºC	PD	187	mW
Derate above 25ºC		1.5	mW/ºC
Thermal Resistance, Junction–to–Ambient(Note 1)	RΘJA	670	ºC/W
Parameter (Both Junctions Heated)	**Symbol**	**Limits**	**Unit**
Total Device Dissipation, (Note 1) @ TA = 25ºC	PD	250	mW
Derate above 25ºC		2	mW/ºC
Thermal Resistance, Junction–to–Ambient(Note 1)	RΘJA	493	ºC/W
Thermal Resistance, Junction–to–Lead(Note 1)	RΘJL	188	ºC/W
Junction and Storage temperature	TJ,Tstg	−55~+150	ºC

1. FR–4 @ Minimum Pad

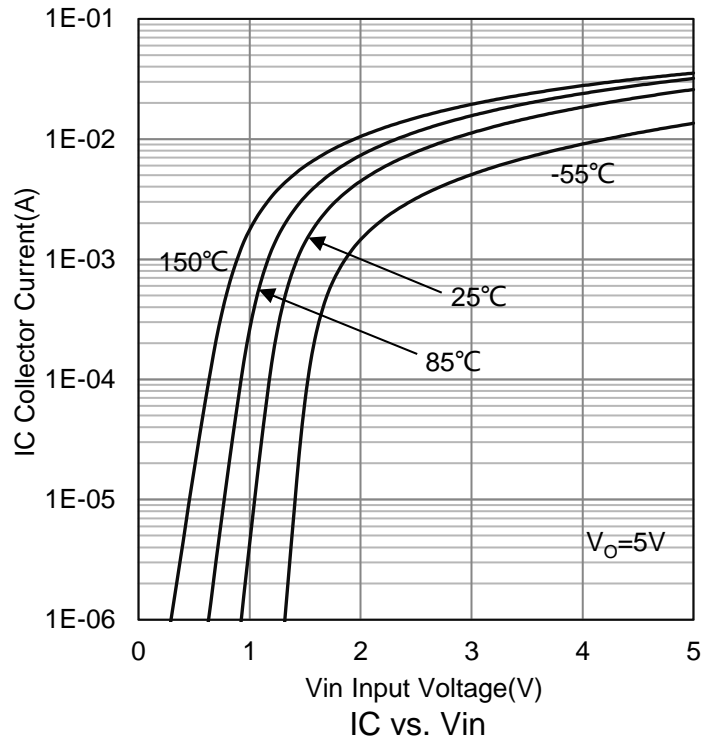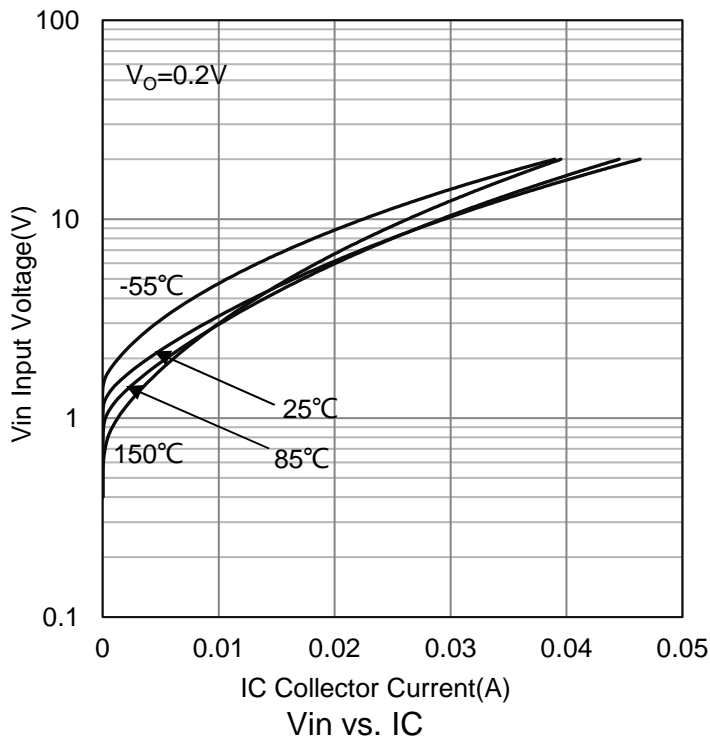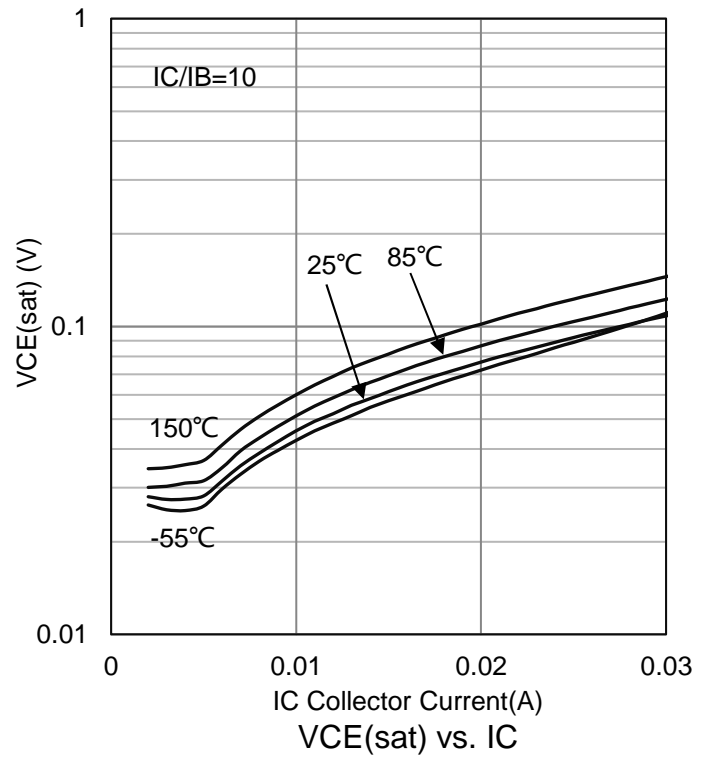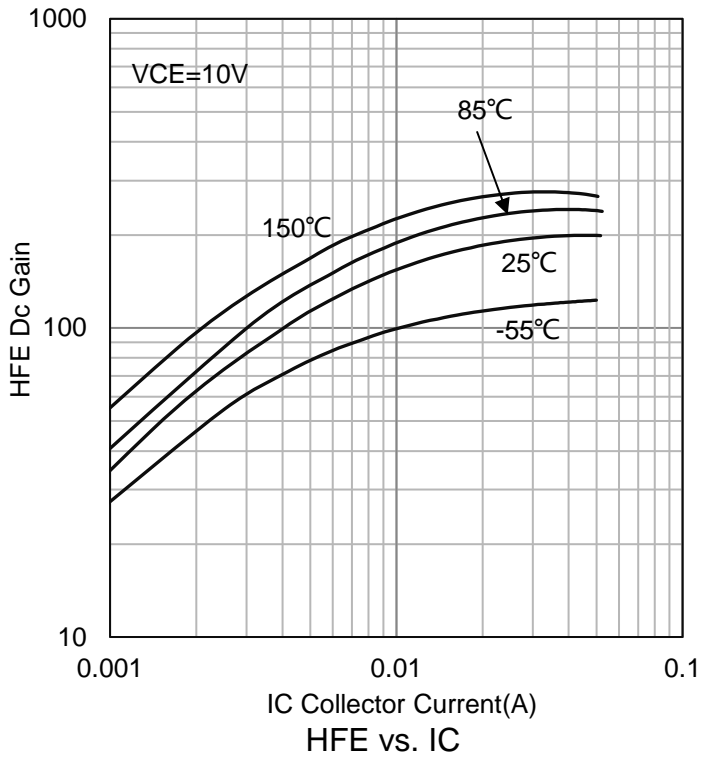## 5. ELECTRICAL CHARACTERISTICS (Ta= 25ºC)

OFF CHARACTERISTICS

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Collector–Emitter Breakdown Voltage (IC = 2.0 mA, IB = 0)	VBR(CEO)	50	-	-	V
Collector–Base Breakdown Voltage (IC = 10 µA, IE = 0)	VBR(CBO)	50	-	-	V
Emitter–Base Breakdown Voltage (IE = 200 µA, IC = 0)	VBR(EBO)	6	-	-	V
Collector-Base Cutoff Current (VCB = 50 V, IE = 0)	ICBO	-	-	100	nA
Collector-Emitter Cutoff Current (VCE = 50 V, IB = 0)	ICEO	-	-	500	nA
Emitter-Base Cutoff Current (VEB = 6.0 V, IC = 0)	IEBO	-	-	0.1	mA

ON CHARACTERISTICS (Note 2)
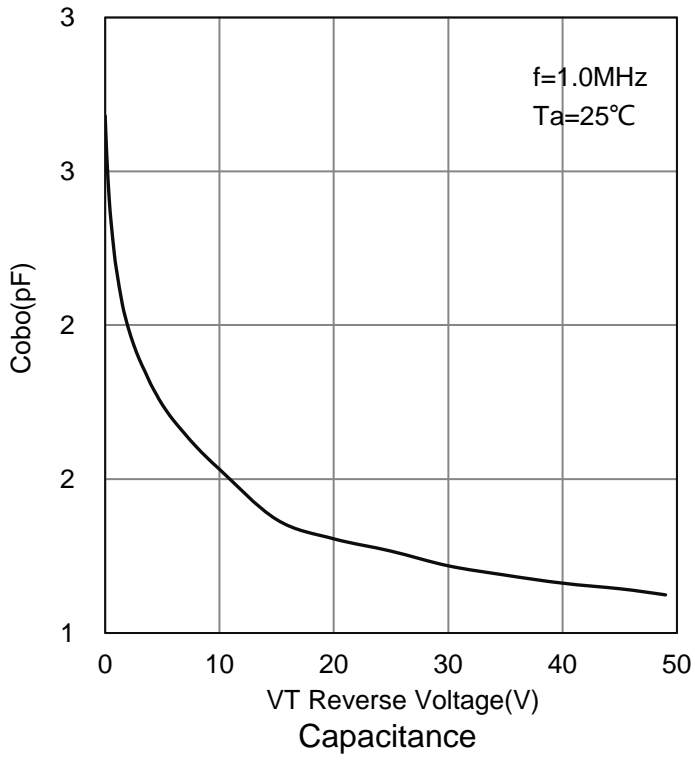
DC Current Gain (IC = 5.0 mA, VCE = 10 V)	HFE	80	140	-	
Collector–Emitter Saturation Voltage (IC = 10 mA, IB = 0.3 mA)	VCE(sat)	-	-	0.25	V
Output Voltage (on) (VCC = 5.0 V, VB = 3.5 V, RL =1.0KΩ)	VOL	-	-	0.2	V
Output Voltage (on) (VCC = 5.0 V, VB = 0.5 V, RL =1.0KΩ)	VOH	4.9	-	-	V
Input Resistor	R1	32.9	47	61.1	KΩ
Resistor Ratio	R1/R2	0.8	1	1.2	

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

6.ELECTRICAL CHARACTERISTICS CURVES

HFE vs. IC

VCE(sat) vs. IC

Vin vs. IC

IC vs. Vin

6.ELECTRICAL CHARACTERISTICS CURVES(Con.)

f=1.0MHz
Ta=25℃

Cobo(pF)

VT Reverse Voltage(V)

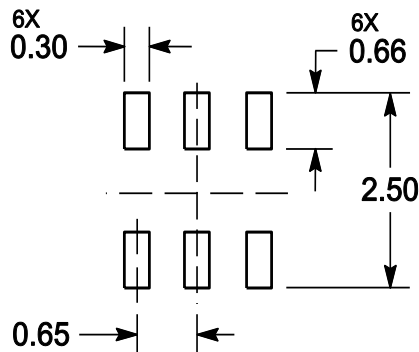Capacitance

7.OUTLINE AND DIMENSIONS

Notes:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.

2. CONTROLLING DIMENSION: MILLIMETERS.

3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.

4. DIMENSIONS D AND E1 DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	---	---	1.10	---	---	0.043
A1	0.00	---	0.10	0	---	0.004
A2	0.70	0.90	1.00	0.027	0.035	0.039
b	0.15	0.20	0.25	0.006	0.008	0.01
C	0.08	0.15	0.22	0.003	0.006	0.009
D	1.80	2.00	2.20	0.07	0.078	0.086
E	2.00	2.10	2.20	0.078	0.082	0.086
E1	1.15	1.25	1.35	0.045	0.049	0.053
e	0.65 BSC			0.026 BSC		
L	0.26	0.36	0.46	0.010	0.014	0.018
L2	0.15 BSC			0.006 BSC		
aaa	0.15			0.01		
bbb	0.30			0.01		
ccc	0.10			0.00		
ddd	0.10			0.00		

8.SOLDERING FOOTPRINT

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RN1607(TE85L,F)   DRC9A14E0L   DTA124GKAT146   DTA144WETL   DTA144WKAT146   DTC113EET1G   DTC115TETL
DTC115TKAT146   DTC124TETL   DTC144VUAT106   MUN5241T1G   BCR158WH6327XTSA1   NSBA114TDP6T5G   NSBA123EF3T5G
NSBA143TF3T5G   NSBA144TF3T5G   NSBC113EF3T5G   NSBC124XF3T5G   SMUN5330DW1T1G   SSVMUN5312DW1T2G
RN1303(TE85L,F)   RN1306(TE85L,F)   RN4605(TE85L,F)   TTEPROTOTYPE79   EMH15T2R   SMUN2214T3G   SMUN5335DW1T1G
NSBC143ZPDP6T5G   NSVDTA143ZET1G   NSVDTC143ZET1G   NSVMUN5113DW1T3G   SMUN2214T1G   FMA7AT148   DTC114EUA-TP
SMUN5237DW1T1G   SMUN5213DW1T1G   SMUN5114DW1T1G   SMUN2111T1G   DTC124ECA-TP   DTC123TM3T5G   DTA114ECA-TP
DTA113EM3T5G   DTC113EM3T5G   NSVMUN5135DW1T1G   NSVMUN2237T1G   NSVDTC143ZM3T5G   SMUN5335DW1T2G
SMUN5216DW1T1G   NSVMUN5316DW1T1G   NSVMUN5215DW1T1G