

Features

- AEC-Q101 Qualified
- Halogen Free. "Green" Device (Note 1)
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Maximum Ratings @ 25°C Unless Otherwise Specified

- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 625°C/W Junction to Ambient

TR1-PNP Pin3,4,5

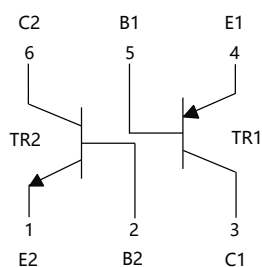
Parameter	Symbol	Rating	Unit
Collector-Base Voltage	V_{CBO}	-60	V
Collector-Emitter Voltage	V_{CEO}	-60	V
Emitter-Base Voltage	V_{EBO}	-5	V
Collector Current	I_C	-0.6	A
Collector Dissipation	P_C	200	mW

TR2-NPN Pin1,2,6

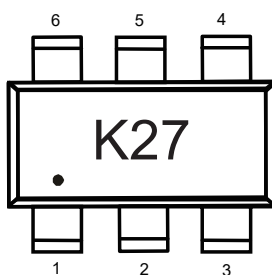
Parameter	Symbol	Rating	Unit
Collector-Base Voltage	V_{CBO}	75	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	6	V
Collector Current	I_C	0.6	A
Collector Dissipation	P_C	200	mW

Note: 1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

Internal Structure

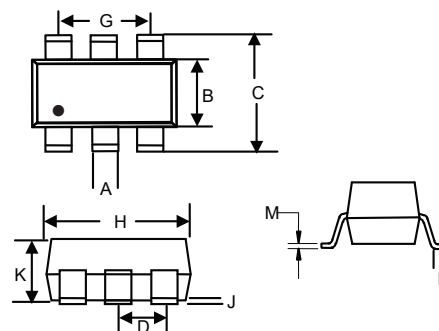


Device Marking



NPN/PNP Small Signal Transistors

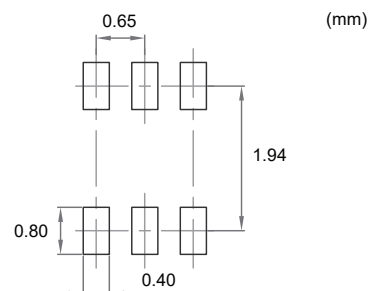
SOT-363



DIMENSIONS

DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.006	0.014	0.15	0.35	
B	0.045	0.053	1.15	1.35	
C	0.079	0.096	2.00	2.45	
D	0.026		0.65		TYP.
G	0.047	0.055	1.20	1.40	
H	0.071	0.087	1.80	2.20	
J	-----	0.004	-----	0.10	
K	0.031	0.043	0.80	1.10	
L	0.010	0.018	0.26	0.46	
M	0.003	0.006	0.08	0.15	

Suggested Solder Pad Layout



TR1-PNP Electrical Characteristics @ 25°C Unless Otherwise Specified

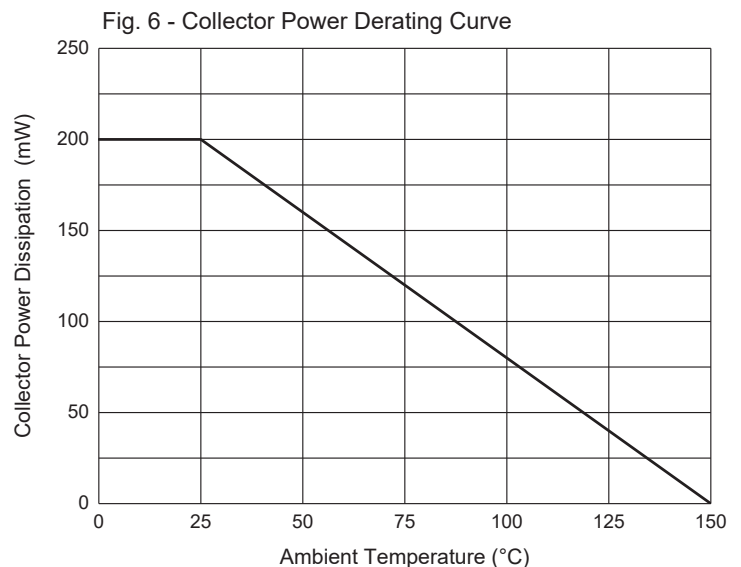
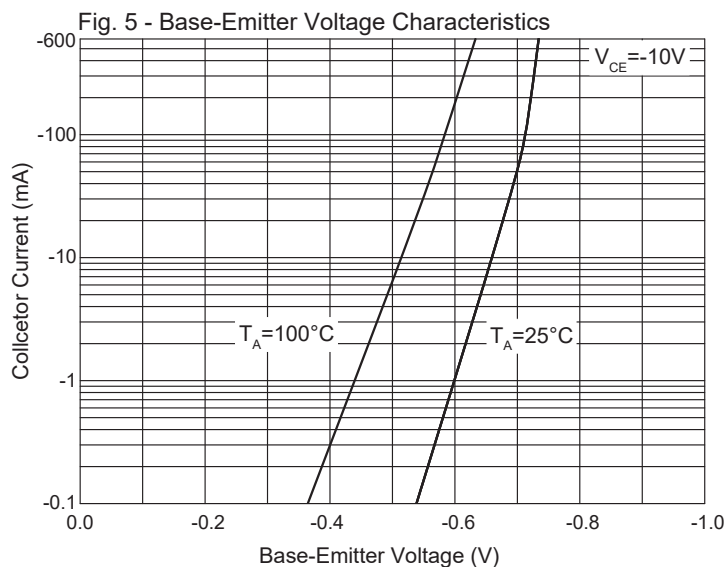
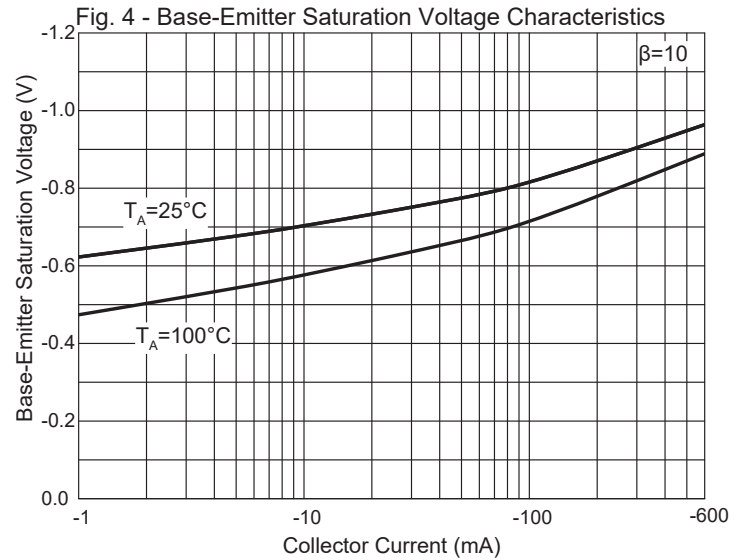
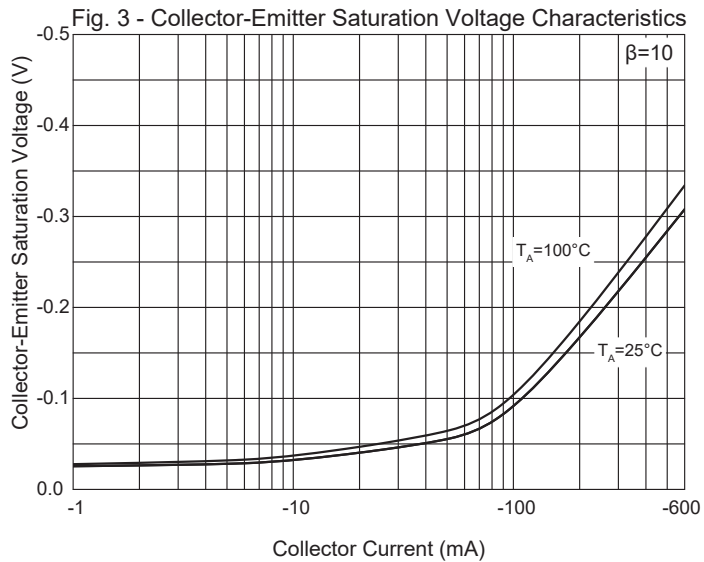
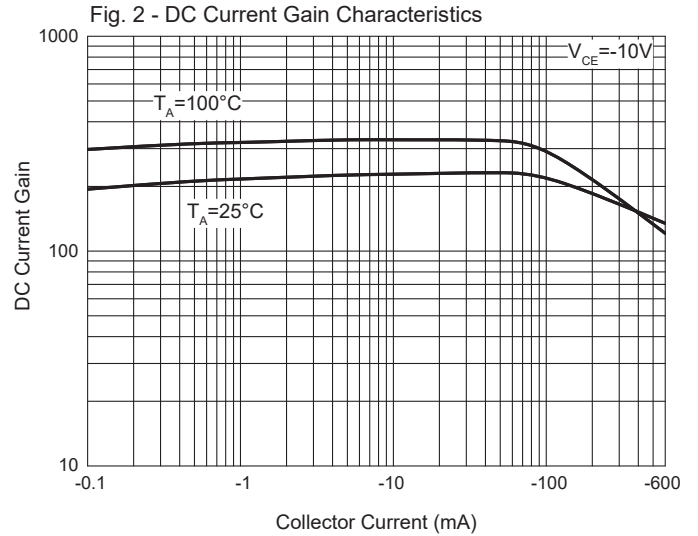
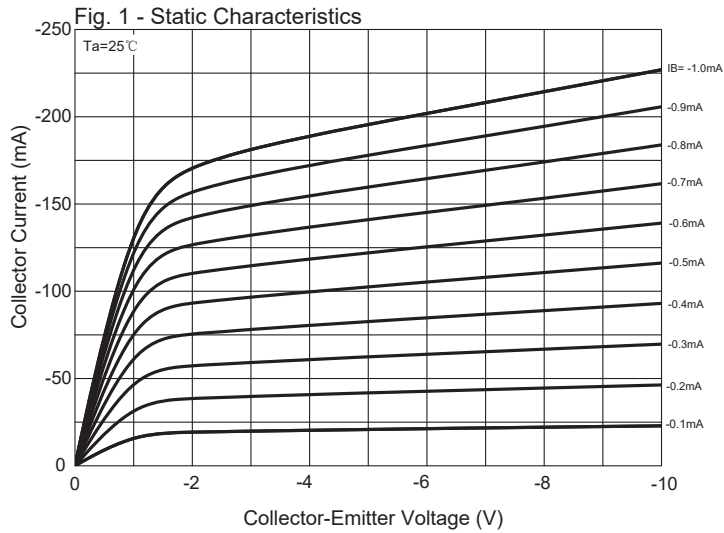
Parameter	Symbol	Min	Typ	Max	Units	Conditions
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-60			V	$I_C = -10\mu A, I_E = 0$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-60			V	$I_C = -10mA, I_B = 0$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-5			V	$I_E = -10\mu A, I_C = 0$
Collector-Base Cutoff Current	I_{CBO}			-10	nA	$V_{CB} = -50V, I_E = 0$
Collector Cutoff Current	I_{CEX}			-50	nA	$V_{CE} = -30V, V_{EB(off)} = -0.5V$
Emitter-Base Cutoff Current	I_{EBO}			-10	nA	$V_{EB} = -5V, I_C = 0$
DC Current Gain (Note2)	$h_{FE(1)}$	75				$V_{CE} = -10V, I_C = -0.1mA$
	$h_{FE(2)}$	100				$V_{CE} = -10V, I_C = -1mA$
	$h_{FE(3)}$	100				$V_{CE} = -10V, I_C = -10mA$
	$h_{FE(4)}$	100		300		$V_{CE} = -10V, I_C = -150mA$
	$h_{FE(5)}$	50				$V_{CE} = -10V, I_C = -500mA$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			-0.4	V	$I_C = -150mA, I_B = -15mA$
				-1.6	V	$I_C = -500mA, I_B = -50mA$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$			-1.3	V	$I_C = -150mA, I_B = -15mA$
				-2.6	V	$I_C = -500mA, I_B = -50mA$
Transition Frequency	f_T	250			MHz	$V_{CE} = -20V, I_C = -50mA, f = 100MHz$

TR2-NPN Electrical Characteristics @ 25°C Unless Otherwise Specified

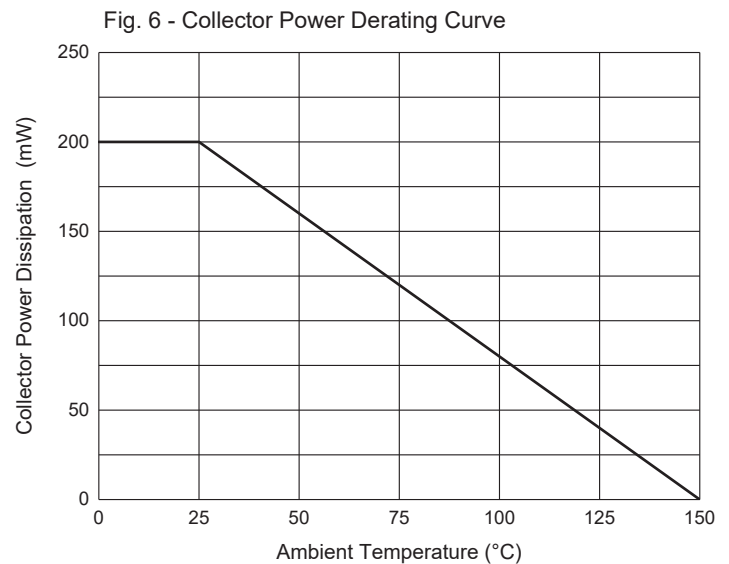
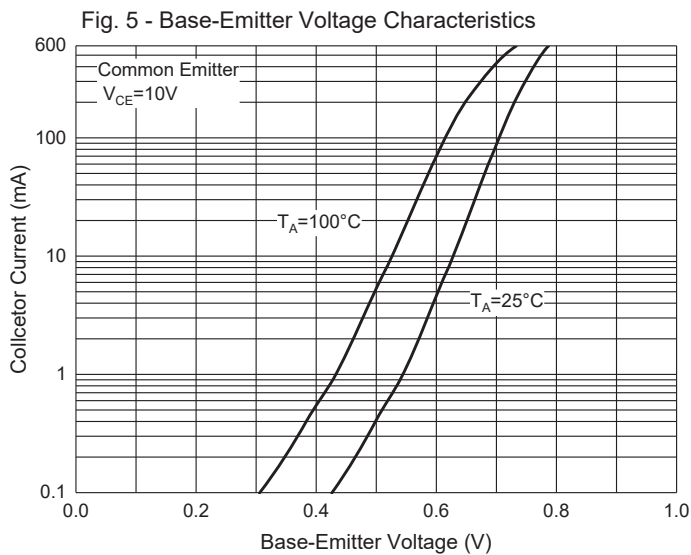
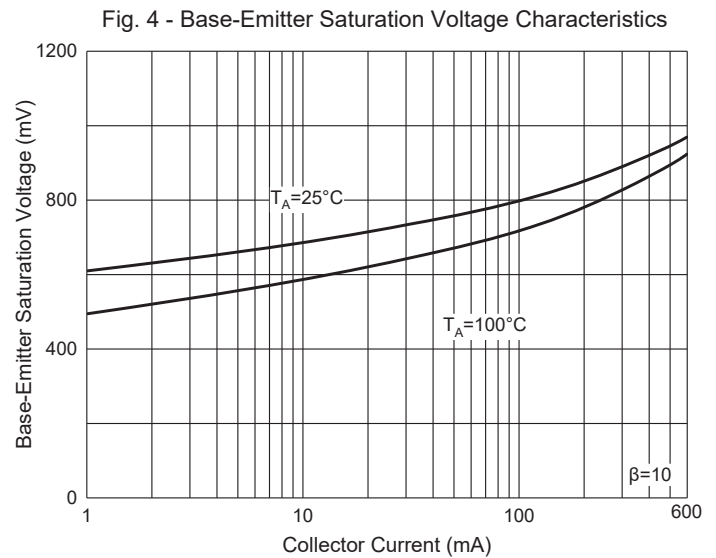
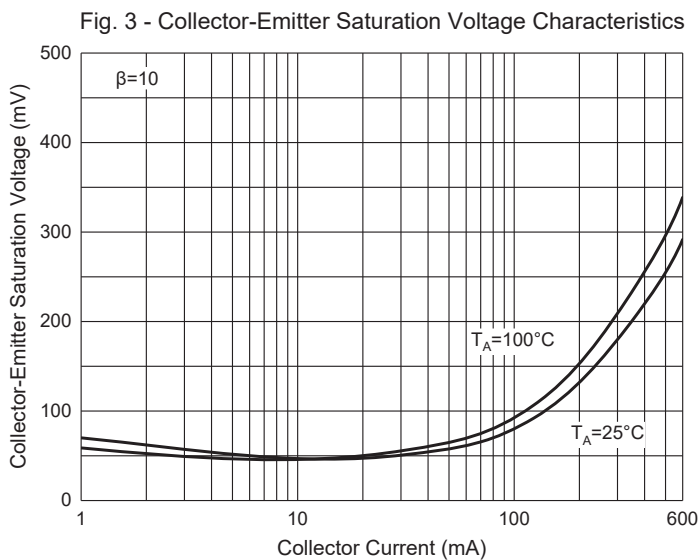
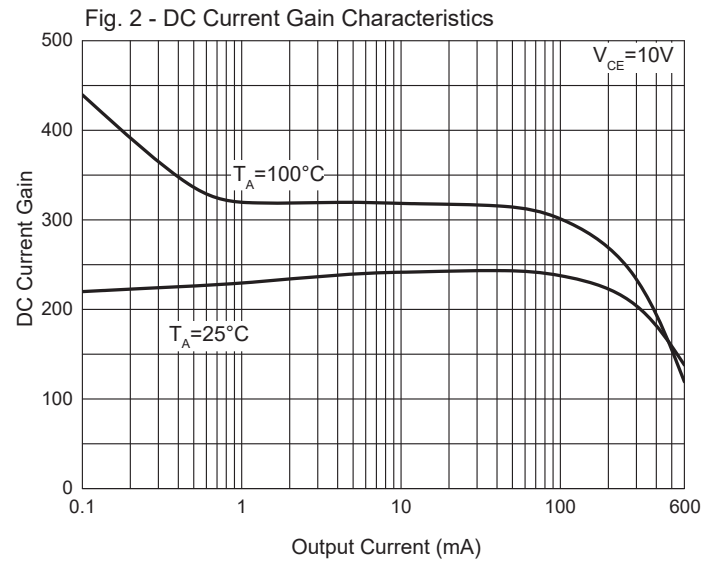
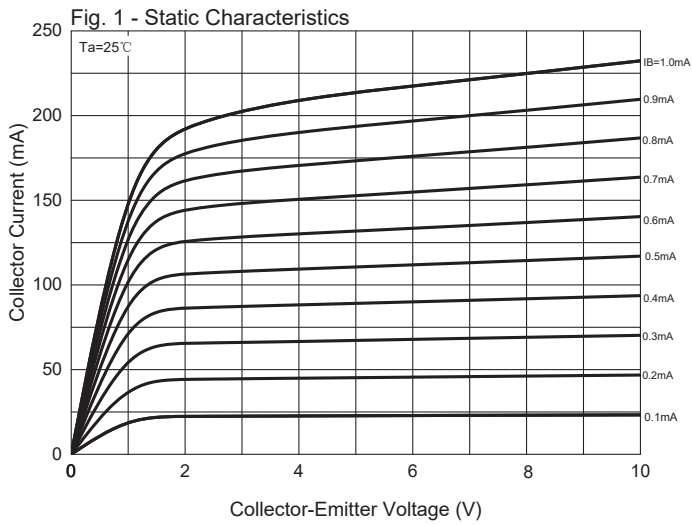
Parameter	Symbol	Min	Typ	Max	Units	Conditions
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	75			V	$I_C = 10\mu A, I_E = 0$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	40			V	$I_C = 10mA, I_B = 0$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	6			V	$I_E = 10\mu A, I_C = 0$
Collector Cutoff Current	I_{CBO}			10	nA	$V_{CB} = 60V, I_E = 0$
Collector Cutoff Current	I_{CEX}			10	nA	$V_{CE} = 60V, V_{EB(off)} = 3V$
Emitter Cutoff Current	I_{EBO}			10	nA	$V_{EB} = 3V, I_C = 0$
Base Cutoff Current	I_{BL}			20	nA	$V_{CE} = 60V, V_{EB(off)} = 3V$
DC Current Gain	h_{FE1}	35				$V_{CE} = 10V, I_C = 0.1mA$
	h_{FE2}	50				$V_{CE} = 10V, I_C = 1mA$
	h_{FE3}	75				$V_{CE} = 10V, I_C = 10mA$
	h_{FE4}	100		300		$V_{CE} = 10V, I_C = 150mA$
	h_{FE5}	35				$V_{CE} = 1V, I_C = 150mA$
	h_{FE6}	40				$V_{CE} = 10V, I_C = 500mA$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			0.3	V	$I_C = 150mA, I_B = 15mA$
				1.0	V	$I_C = 500mA, I_B = 50mA$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$			1.2	V	$I_C = 150mA, I_B = 15mA$
				2.0	V	$I_C = 500mA, I_B = 50mA$
Transition Frequency	f_T	250			MHz	$V_{CE} = 20V, I_C = 20mA, f = 100MHz$

Note: 2. Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2.0\%$

Curve Characteristics (PNP Transistor)



Curve Characteristics (NPN Transistor)



Ordering Information

Device	Packing
MMDT2227HE3-TP	Tape&Reel: 3Kpcs/Reel

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