40V LOW $V_{CE(sat)}$ NPN SURFACE MOUNT TRANSISTOR

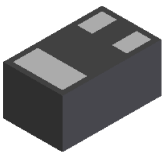
Features

- Low Collector-Emitter Saturation Voltage, $V_{CE(sat)}$
- Ultra-Small Leadless Surface Mount Package
- ESD: HBM 8kV, MM 400V
- Complementary PNP Type Available (DSS3540M)
- **"Lead Free", RoHS Compliant (Note 1)**
- **Halogen, and Antimony Free. "Green" Device (Note 2)**

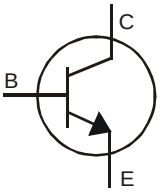
Mechanical Data

- Case: DFN1006-3
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — NiPdAu over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.0009 grams (Approximate)

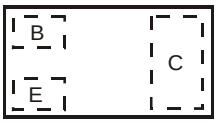
DFN1006-3



Bottom View



Device Symbol



Top View
Device Schematic

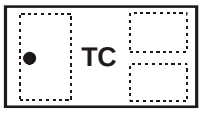
Ordering Information (Note 3)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DSS2540M-7	TC	7	8mm	3,000
DSS2540M-7B	TC	7	8mm	10,000

Notes: 1. No purposefully added lead.
2. Diodes Inc's "Green" policy can be found on our website at http://www.diodes.com
3. For packaging details, go to our website at http://www.diodes.com.

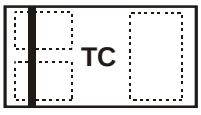
Marking Information

DSS2540M-7



Top View
Dot Denotes Collector Side

DSS2540M-7B



Top View
Bar Denotes Base and Emitter Side

TC = Product Type Marking Code

Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	40	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	6	V
Collector Current - Continuous	I_C	500	mA
Peak Pulse Collector Current	I_{CM}	1	A
Peak Base Current	I_{BM}	100	mA

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 4) @ T_A = 25°C	P_D	250	mW
Thermal Resistance, Junction to Ambient (Note 4) @ T_A = 25°C	$R_{\theta JA}$	500	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes: 4. Device mounted on FR-4 PCB with minimum recommended pad layout.

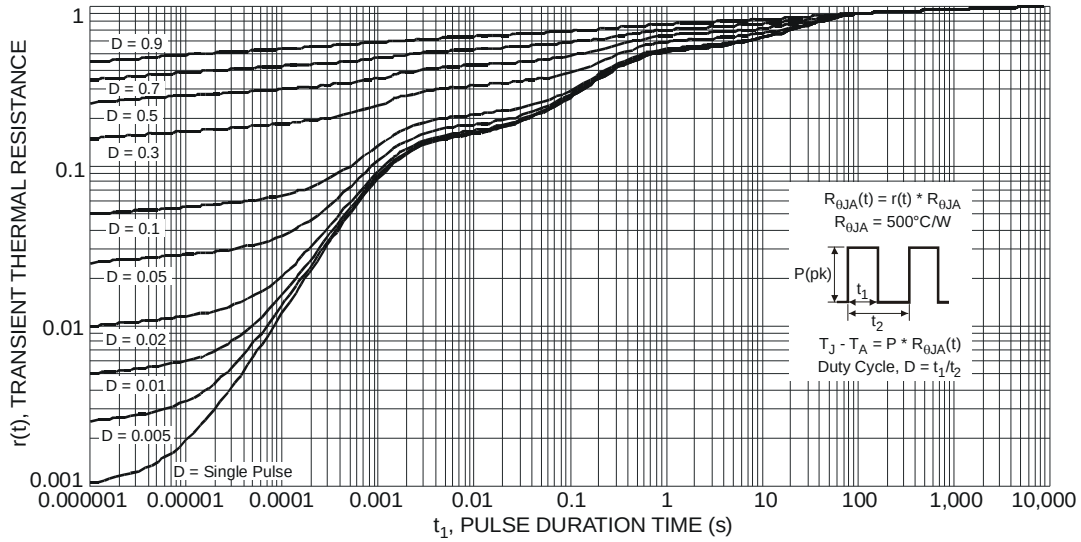


Fig. 1 Transient Thermal Response

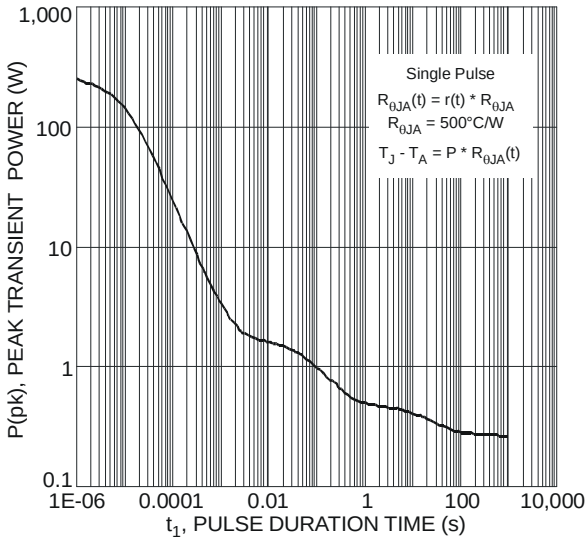


Fig. 2 Single Pulse Maximum Power Dissipation

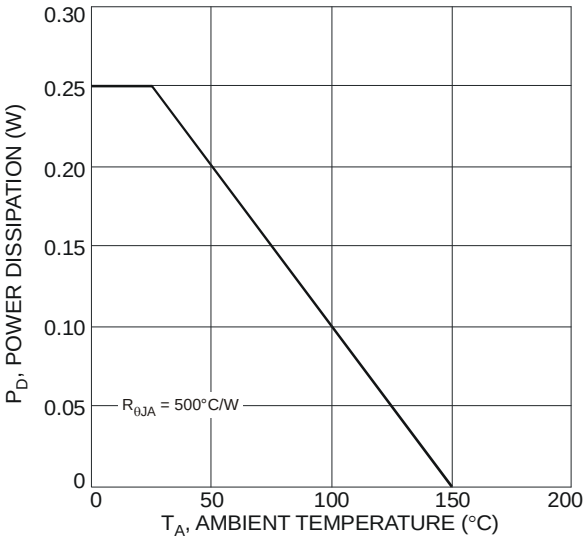


Fig. 3 Power Dissipation vs. Ambient Temperature (Note 4)

Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV_{CBO}	40	—	—	V	I_C = 100μA, I_E = 0
Collector-Emitter Breakdown Voltage (Note 5)	BV_{CEO}	40	—	—	V	I_C = 10mA, I_B = 0
Emitter-Base Breakdown Voltage	BV_{EBO}	6	—	—	V	I_E = 100μA, I_C = 0
Collector Cutoff Current	I_{CBO}	—	—	100 50	nA μA	V_{CB} = 30V, I_E = 0 V_{CB} = 30V, I_E = 0, T_A = 150°C
Emitter Cutoff Current	I_{EBO}	—	—	100	nA	V_{EB} = 5V, I_C = 0
ON CHARACTERISTICS (Note 5)						
DC Current Gain	h_{FE}	200 150 50	— — —	— — —	—	V_{CE} = 2V, I_C = 10mA V_{CE} = 2V, I_C = 100mA V_{CE} = 2V, I_C = 500mA
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	— — — —	— — — —	50 100 200 250	mV	I_C = 10mA, I_B = 0.5mA I_C = 100mA, I_B = 5mA I_C = 200mA, I_B = 10mA I_C = 500mA, I_B = 50mA
Collector-Emitter Saturation Resistance	$R_{CE(sat)}$	—	—	500	mΩ	I_C = 500mA, I_B = 50mA
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	—	1.2	V	I_C = 500mA, I_B = 50mA
Base-Emitter Turn On Voltage	$V_{BE(on)}$	—	—	1.1	V	V_{CE} = 2V, I_C = 100mA
SMALL SIGNAL CHARACTERISTICS						
Output Capacitance	C_{obo}	—	—	6	pF	V_{CB} = 10V, f = 1.0MHz
Current Gain-Bandwidth Product	f_T	250	300	—	MHz	V_{CE} = 5V, I_C = 100mA, f = 100MHz

Notes: 5. Measured under pulsed conditions. Pulse width = 300μs. Duty cycle ≤2%.

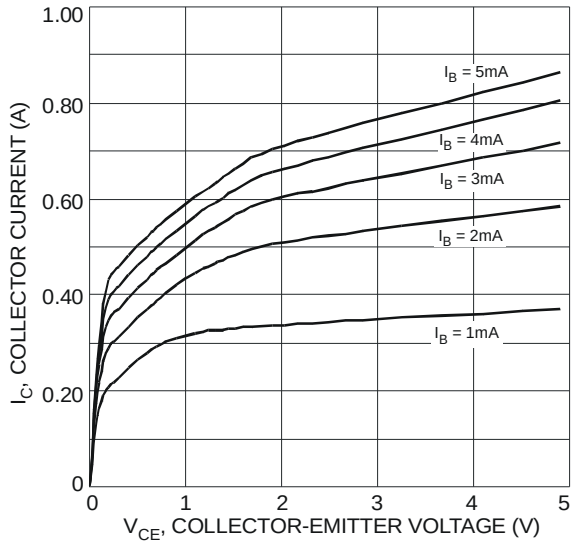


Fig. 4 Typical Collector Current vs. Collector-Emitter Voltage

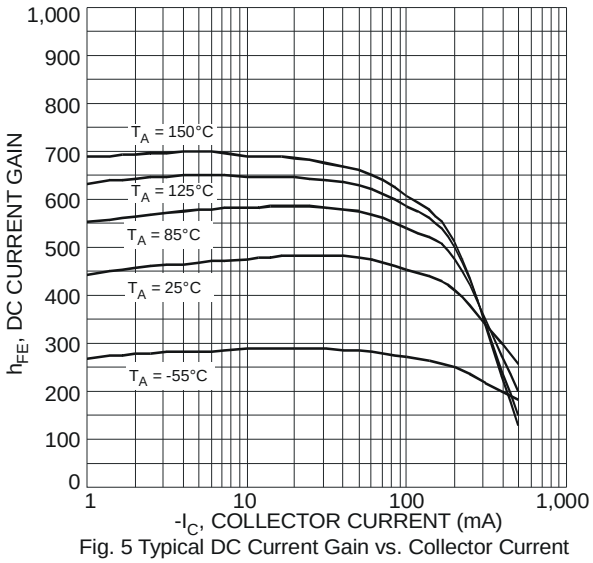


Fig. 5 Typical DC Current Gain vs. Collector Current

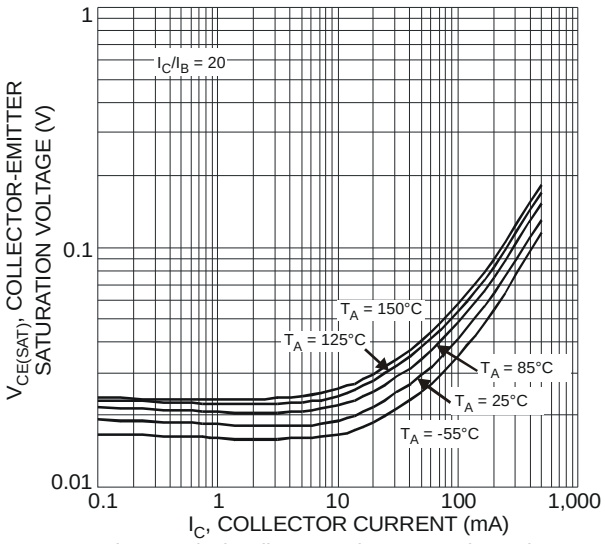


Fig. 6 Typical Collector-Emitter Saturation Voltage vs. Collector Current

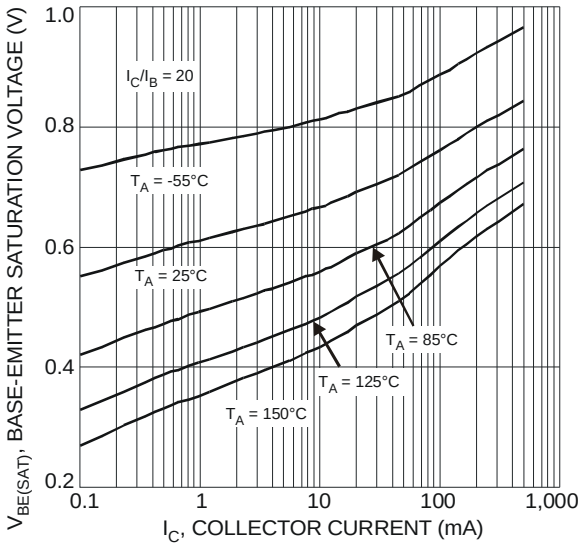


Fig. 7 Typical Base-Emitter Saturation Voltage vs. Collector Current

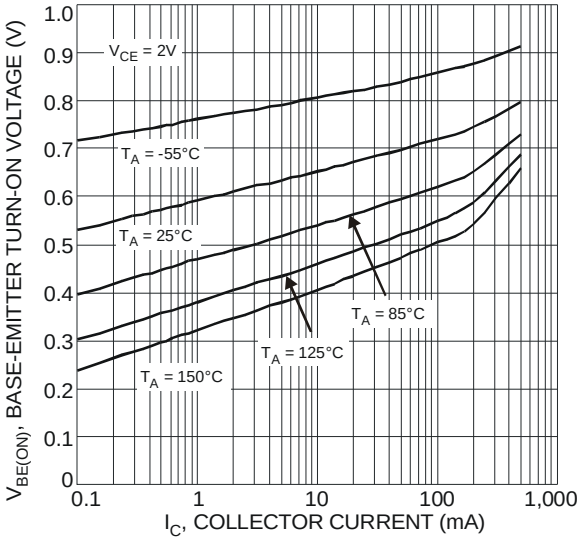


Fig. 8 Typical Base-Emitter Turn-On Voltage vs. Collector Current

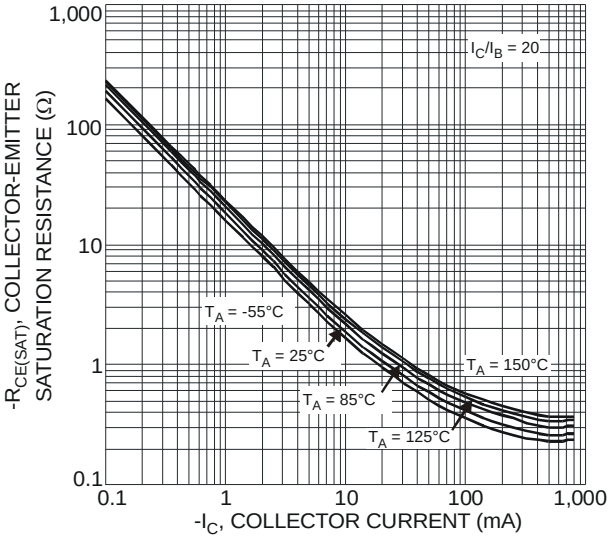
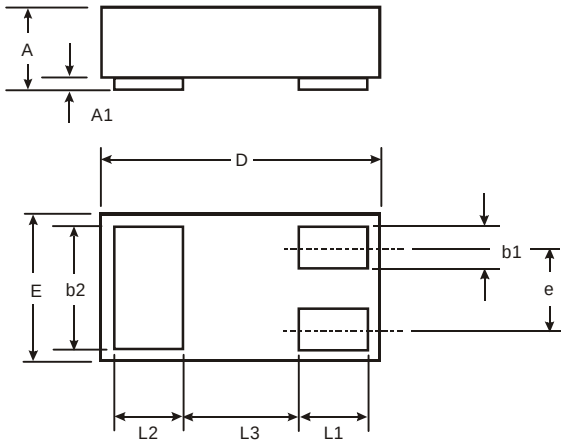


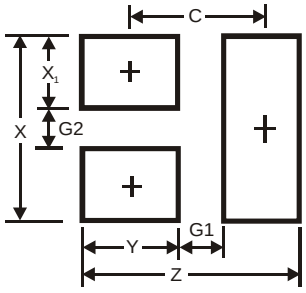
Fig. 9 Typical Collector-Emitter Saturation Resistance vs. Collector Current

Package Outline Dimensions



DFN1006-3			
Dim	**Min**	**Max**	**Typ**
A	0.47	0.53	0.50
A1	0	0.05	0.03
b1	0.10	0.20	0.15
b2	0.45	0.55	0.50
D	0.95	1.075	1.00
E	0.55	0.675	0.60
e	—	—	0.35
L1	0.20	0.30	0.25
L2	0.20	0.30	0.25
L3	—	—	0.40
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
Z	1.1
G1	0.3
G2	0.2
X	0.7
X1	0.25
Y	0.4
C	0.7