

Features

- $BV_{CEO} > 60V$
- $I_C = 1A$ High Continuous Collector Current
- $R_{CE(sat)} = 180m\Omega$ for a Low Equivalent On-Resistance
- Low Saturation Voltage $V_{CE(sat)} < 220mV @ 1A$
- P_D up to 2.47W for Power-Demanding Applications
- $R_{\theta JA}$ Efficient, 40% Lower than SOT26
- Low Profile 0.6mm High Package for Thin Applications
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The DSS4160FDBQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF16949 certified facilities.**
<https://www.diodes.com/quality/product-definitions/>

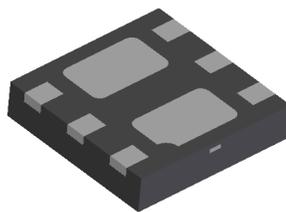
Mechanical Data

- Package: U-DFN2020-6 (Type B)
- Package Material: Molded Plastic. "Green" Molding Compound.
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – NiPdAu, Solderable per MIL-STD-202, Method 208 ^{e4}
- Weight: 0.0065 grams (Approximate)

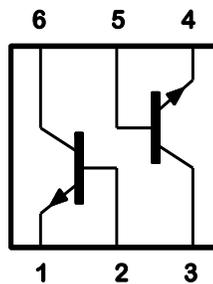
Application

- Load switches
- Power management
- Charging circuits
- Power switches (e.g. motors, fans)

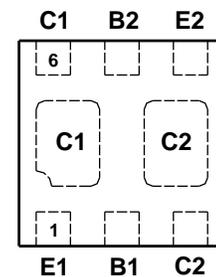
U-DFN2020-6 (Type B)



Bottom View



Device Symbol


 Top View
Pin-Out

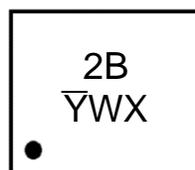
Ordering Information (Note 4)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DSS4160FDBQ-7	Automotive	2B	7	8	3,000

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 4. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>

Marking Information

U-DFN2020-6 (Type B)



- 2B = Product type Marking Code
- Y = Year: 0~9
- W = Week: A~Z = 1~26 Week;
A~Z = 27~52 Week;
Z Represents 52 and 53 Week
- X = A~Z: Internal Code

Absolute Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	60	V
Collector-Emitter Voltage	V_{CEO}	60	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	1	A
Peak Pulse Collector Current	I_{CM}	1.5	A
Base Current	I_B	300	mA
Peak Base Current	I_{BM}	1	A

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

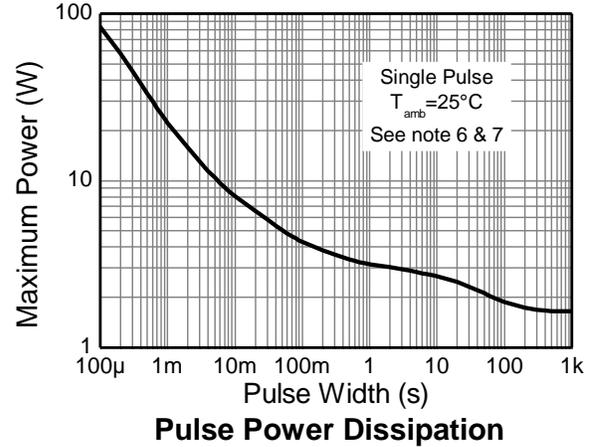
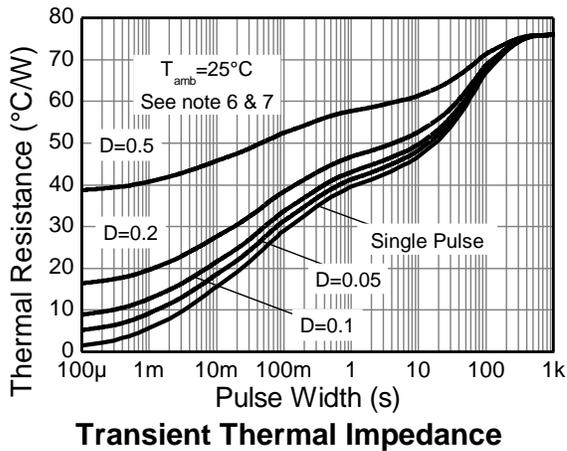
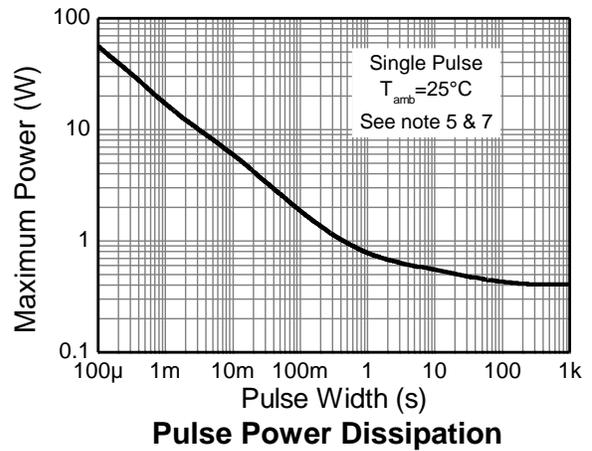
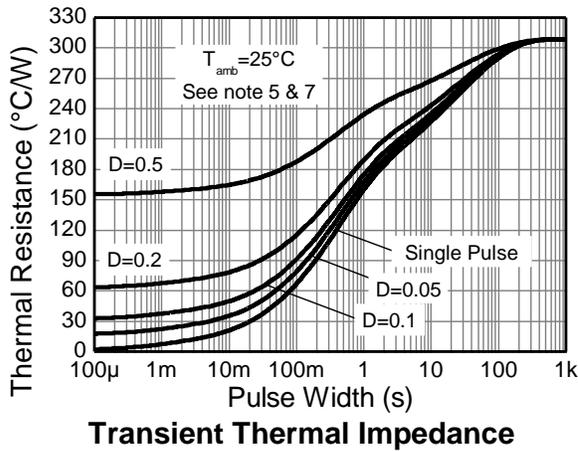
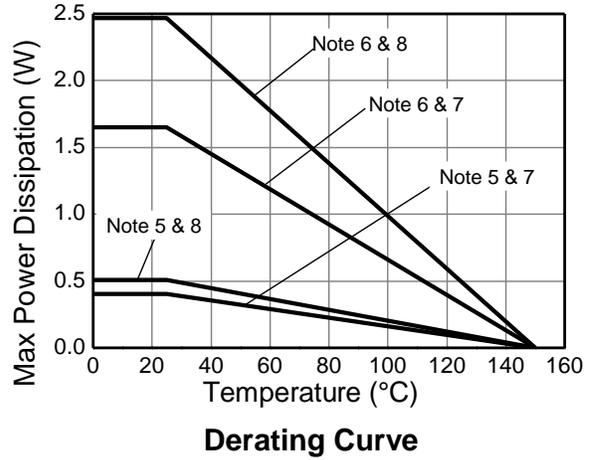
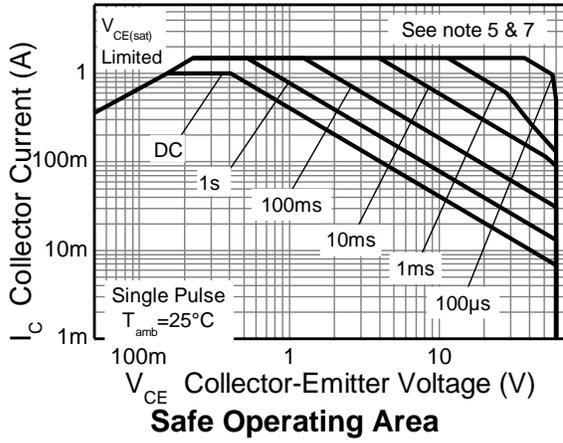
Characteristic	Symbol	Value	Unit
Power Dissipation	(Note 5, 7)	405	mW
	(Note 5, 8)	510	
	(Note 6, 7)	1650	
	(Note 6, 8)	2470	
Thermal Resistance, Junction to Ambient	(Note 5, 7)	308	$^\circ\text{C/W}$
	(Note 5, 8)	245	
	(Note 6, 7)	76	
	(Note 6, 8)	51	
Thermal Resistance, Junction to Lead	$R_{\theta JL}$	18	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

ESD Ratings (Note 10)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge – Human Body Model	ESD HBM	4000	V	3A
Electrostatic Discharge – Charged Device Model	ESD CDM	1000	V	C3

- Notes:
- For a device mounted with the exposed collector pads on minimum recommended pad layout that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
 - Same as Note (5), except the device is mounted with the collector pad on 28mm x 28mm (8cm²) 2oz copper.
 - For a dual device with one active die.
 - For dual device with two active die running at equal power.
 - Thermal resistance from junction to solder-point (on the exposed collector pads).
 - Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information



Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
Collector-Base Breakdown Voltage	BV _{CBO}	60	—	—	V	I _C = 100μA
Collector-Emitter Breakdown Voltage (Note 11)	BV _{CEO}	60	—	—	V	I _C = 10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	7	—	—	V	I _E = 100μA
Collector-Base Cutoff Current	I _{CBO}	—	—	100	nA	V _{CB} = 48V, I _E = 0
		—	—	50	μA	V _{CB} = 48V, I _E = 0, T _A = +150°C
Emitter-Base Cutoff Current	I _{EBO}	—	—	100	nA	V _{EB} = 5.6V, I _C = 0
DC Current Gain (Note 11)	h _{FE}	290	430	—	—	V _{CE} = 2V, I _C = 100mA
		150	220	—		V _{CE} = 2V, I _C = 500mA
		70	110	—		V _{CE} = 2V, I _C = 1A
Collector-Emitter Saturation Voltage (Note 11)	V _{CE(sat)}	—	90	120	mV	I _C = 500mA, I _B = 50mA
		—	170	220		I _C = 1A, I _B = 100mA
		—	185	240		I _C = 1A, I _B = 50mA
Equivalent On-Resistance (Note 11)	R _{CE(sat)}	—	180	240	mΩ	I _C = 500mA, I _B = 50mA
Base-Emitter Saturation Voltage (Note 11)	V _{BE(sat)}	—	—	1	V	I _C = 0.5A, I _B = 50mA
		—	—	1.1		I _C = 1A, I _B = 50mA
		—	—	1.1		I _C = 1A, I _B = 100mA
Base-Emitter Turn-on Voltage (Note 11)	V _{BE(on)}	—	—	0.9	V	V _{CE} = 2V, I _C = 0.5A
Transition Frequency	f _T	90	175	—	MHz	V _{CE} = 10V, I _C = 50mA, f = 100MHz
Output (Collector) Capacitance	C _{obc}	—	4	6	pF	V _{CB} = 10V, f = 1MHz
Turn-On Time	t _{on}	—	105	—	ns	V _{CC} = 10V, I _C = 0.5A, I _{B1} = -I _{B2} = 25mA
Delay Time	t _d	—	15	—	ns	
Rise Time	t _r	—	90	—	ns	
Turn-Off Time	t _{off}	—	540	—	ns	
Storage Time	t _s	—	410	—	ns	
Fall Time	t _f	—	130	—	ns	

Note: 11. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

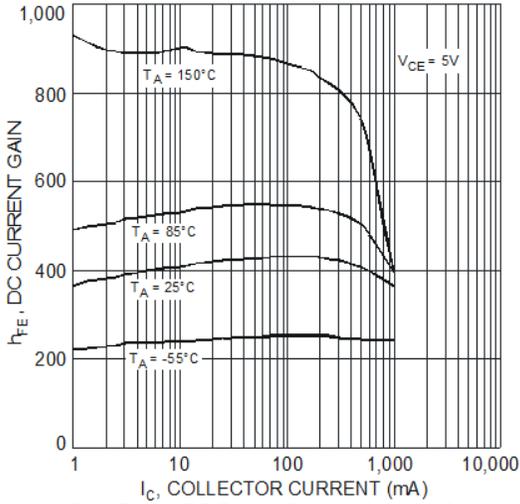


Fig. 1 Typical DC Current Gain vs. Collector Current

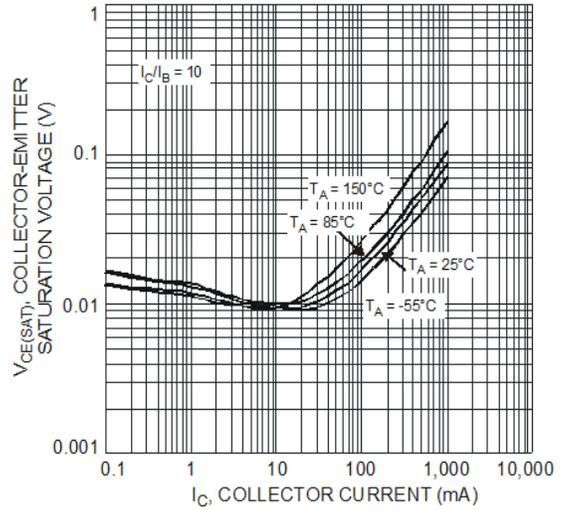


Fig. 2 Typical Collector-Emitter Saturation Voltage vs. Collector Current

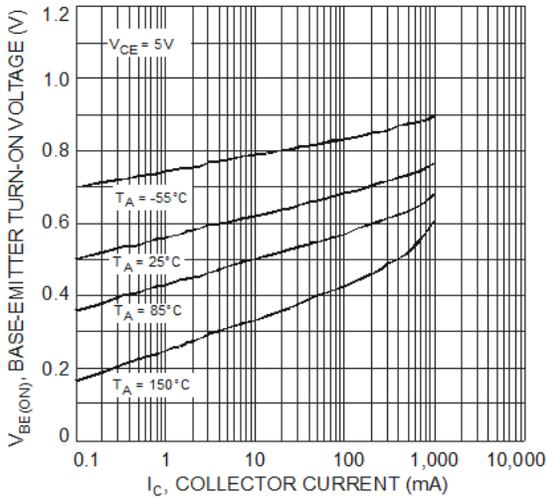


Fig. 3 Typical Base-Emitter Turn-On Voltage vs. Collector Current

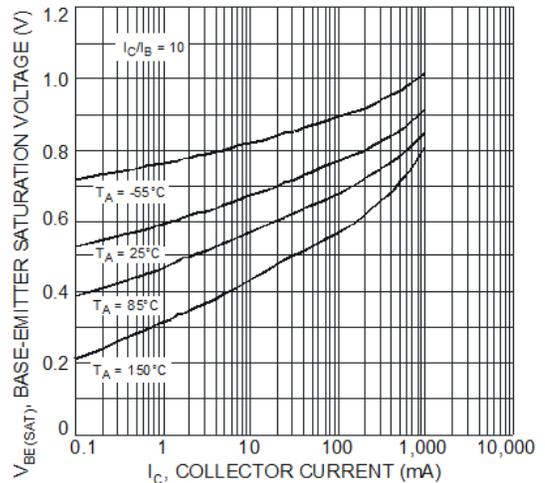


Fig. 4 Typical Base-Emitter Saturation Voltage vs. Collector Current

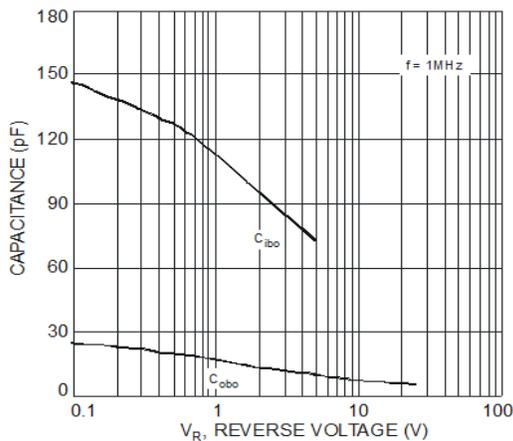


Fig. 5 Typical Capacitance Characteristics

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