

NGD8209N

Ignition IGBT 12 A, 410 V N-Channel DPAK

This Logic Level Insulated Gate Bipolar Transistor (IGBT) features monolithic circuitry integrating ESD and Over-Voltage clamped protection for use in inductive coil drivers applications. Primary uses include motorbike ignition, Direct Fuel Injection, or wherever high voltage and high current switching is required.

Features

- Ideal for Coil-on-Plug Applications
- DPAK Package Offers Smaller Footprint and Increased Board Space
- Gate-Emitter ESD Protection
- Temperature Compensated Gate-Collector Voltage Clamp Limits Stress Applied to Load
- Low Saturation Voltage
- High Pulsed Current Capability
- These are Pb-Free Devices

MAXIMUM RATINGS (T_J = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V _{CES}	445	V _{DC}
Collector-Gate Voltage	V _{CER}	445	V _{DC}
Gate-Emitter Voltage	V _{GE}	15	V _{DC}
Collector Current-Continuous @ T _C = 25°C - Pulsed	I _C	12 30	A _{DC} A _{AC}
ESD (Human Body Model) R = 1500 Ω, C = 100 pF	ESD	8.0	kV
ESD (Machine Model) R = 0 Ω, C = 200 pF	ESD	800	V
Total Power Dissipation @ T _C = 25°C Derate above 25°C	P _D	94 0.63	Watts W/°C
Operating and Storage Temperature Range	T _J , T _{stg}	-55 to +175	°C

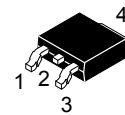
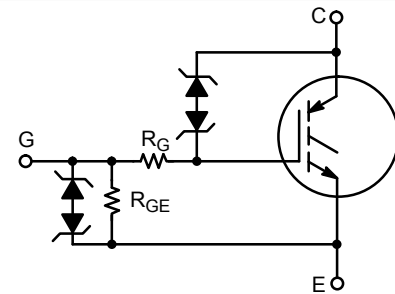
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.



Expertise Applied | Answers Delivered

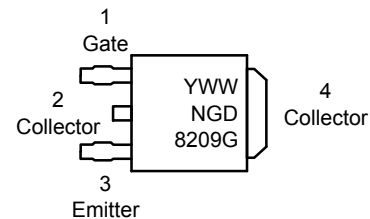
Littelfuse.com

12 AMPS
410 VOLTS
V_{CE(on)} ≤ 2.0 V @
I_C = 6.0 A, V_{GE} ≥ 4.0 V



**DPAK
CASE 369C
STYLE 7**

MARKING DIAGRAM



Y = Year
WW = Work Week
G = Pb-Free Device

ORDERING INFORMATION

Device	Package	Shipping†
NGD8209NT4G	DPAK (Pb-Free)	2500 / Tape & Reel

NGD8209N

UNCLAMPED COLLECTOR-TO-EMITTER AVALANCHE CHARACTERISTICS

Characteristic	Symbol	Value	Unit
Single Pulse Collector-to-Emitter Avalanche Energy $V_{CC} = 50\text{ V}$, $V_{GE} = 5.0\text{ V}$, $\text{Pk } I_L = 7.4\text{ A}$, $L = 10\text{ mH}$, Starting $T_J = 25^\circ\text{C}$	E_{AS}	274	mJ

THERMAL CHARACTERISTICS

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.6	$^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient (Note 1)	$R_{\theta JA}$	105	
Maximum Lead Temperature for Soldering Purposes, 1/8" from case for 5 seconds	T_L	275	$^\circ\text{C}$

1. When surface mounted to an FR4 board using the minimum recommended pad size.

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Test Conditions	Temperature	Min	Typ	Max	Unit
----------------	--------	-----------------	-------------	-----	-----	-----	------

OFF CHARACTERISTICS

Collector-Emitter Clamp Voltage	BV_{CES}	$I_C = 2.0\text{ mA}$	$T_J = -40^\circ\text{C}$ to 150°C	380	410	435	V_{DC}
		$I_C = 10\text{ mA}$	$T_J = -40^\circ\text{C}$ to 150°C	390	420	445	
Zero Gate Voltage Collector Current	I_{CES}	$V_{CE} = 350\text{ V}$, $V_{GE} = 0\text{ V}$	$T_J = 25^\circ\text{C}$	-	1.0	25	μA_{DC}
			$T_J = 150^\circ\text{C}$	-	9.0	50	
			$T_J = -40^\circ\text{C}$	-	0.5	15	
Reverse Collector-Emitter Leakage Current	I_{ECS}	$V_{CE} = -24\text{ V}$	$T_J = 25^\circ\text{C}$	-	0.5	1.0	mA
			$T_J = 150^\circ\text{C}$	-	10	30	
			$T_J = -40^\circ\text{C}$	-	0.05	0.5	
Reverse Collector-Emitter Clamp Voltage	$BV_{CES(R)}$	$I_C = -75\text{ mA}$	$T_J = 25^\circ\text{C}$	26	33	38	V_{DC}
			$T_J = 150^\circ\text{C}$	29	36	41	
			$T_J = -40^\circ\text{C}$	24	32	36	
Gate-Emitter Clamp Voltage	BV_{GES}	$I_G = 5.0\text{ mA}$	$T_J = -40^\circ\text{C}$ to 150°C	10	13	16	V_{DC}
Gate-Emitter Leakage Current	I_{GES}	$V_{GE} = 10\text{ V}$	$T_J = -40^\circ\text{C}$ to 150°C	380	635	1000	μA_{DC}
Gate Resistor	R_G	-	$T_J = -40^\circ\text{C}$ to 150°C	-	70	-	Ω
Gate Emitter Resistor	R_{GE}	-	$T_J = -40^\circ\text{C}$ to 150°C	10	16	26	k Ω

ON CHARACTERISTICS (Note 2)

Gate Threshold Voltage	$V_{GE(th)}$	$I_C = 1.0\text{ mA}$, $V_{GE} = V_{CE}$	$T_J = 25^\circ\text{C}$	1.0	1.42	2.0	V_{DC}
			$T_J = 150^\circ\text{C}$	0.7	0.95	1.5	
			$T_J = -40^\circ\text{C}$	1.1	1.62	2.2	
Threshold Temperature Coefficient (Negative)	-	-	-	-	3.5	-	mV/ $^\circ\text{C}$

2. Pulse Test: Pulse Width $\leq 300\ \mu\text{s}$, Duty Cycle $\leq 2\%$.

NGD8209N

ELECTRICAL CHARACTERISTICS (continued)

Characteristic	Symbol	Test Conditions	Temperature	Min	Typ	Max	Unit
ON CHARACTERISTICS (continued) (Note 3)							
Collector-to-Emitter On-Voltage	$V_{CE(on)}$	$I_C = 6.0 \text{ A}, V_{GE} = 4.0 \text{ V}$	$T_J = 25^\circ\text{C}$	0.8	1.45	2.0	V_{DC}
			$T_J = 150^\circ\text{C}$	0.85	1.44	1.85	
			$T_J = -40^\circ\text{C}$	1.0	1.5	1.95	
		$I_C = 10 \text{ A}, V_{GE} = 4.5 \text{ V}$	$T_J = 25^\circ\text{C}$	1.1	1.79	2.3	
			$T_J = 150^\circ\text{C}$	1.2	1.9	2.2	
			$T_J = -40^\circ\text{C}$	1.3	1.77	2.2	
Forward Transconductance	gfs	$V_{CE} = 5.0 \text{ V}, I_C = 6.0 \text{ A}$	$T_J = -40^\circ\text{C}$ to 150°C	5.0	14	30	Mhos

3. Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2\%$.

TYPICAL CHARACTERISTICS

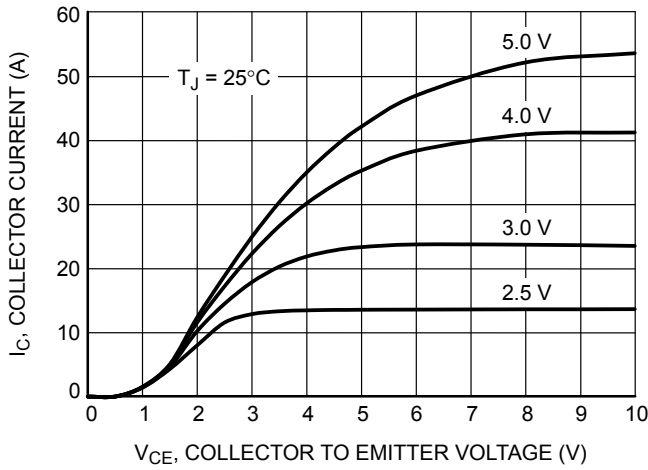


Figure 1. Output Characteristics

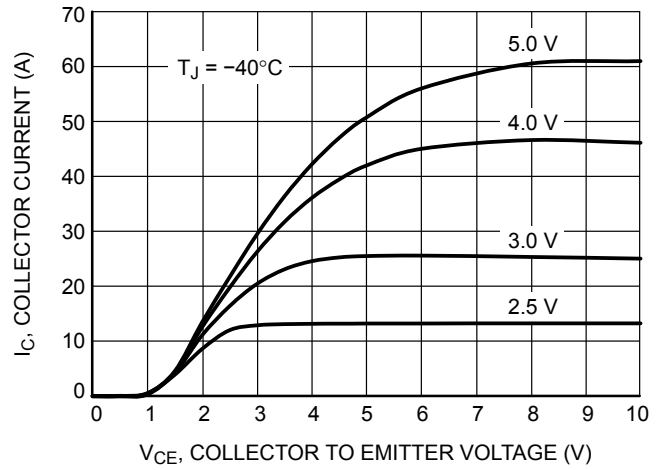


Figure 2. Output Characteristics

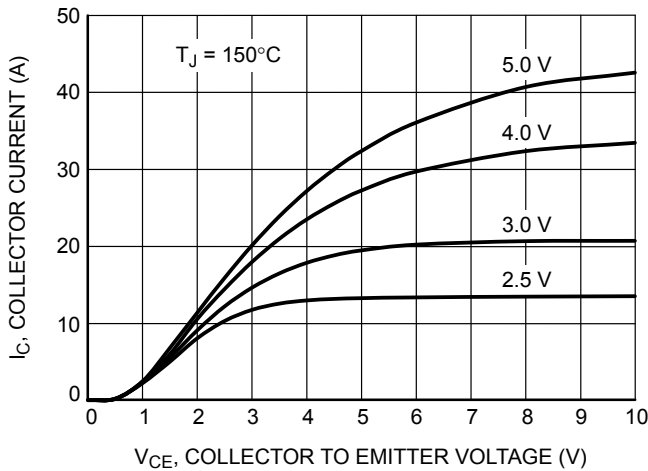


Figure 3. Output Characteristics

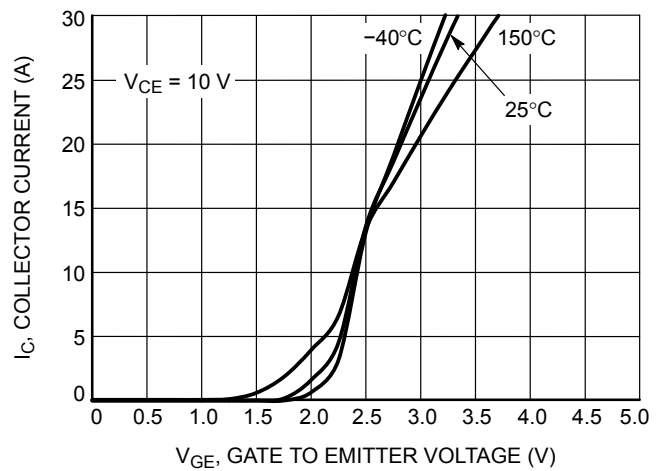


Figure 4. Transfer Characteristics

NGD8209N

TYPICAL CHARACTERISTICS

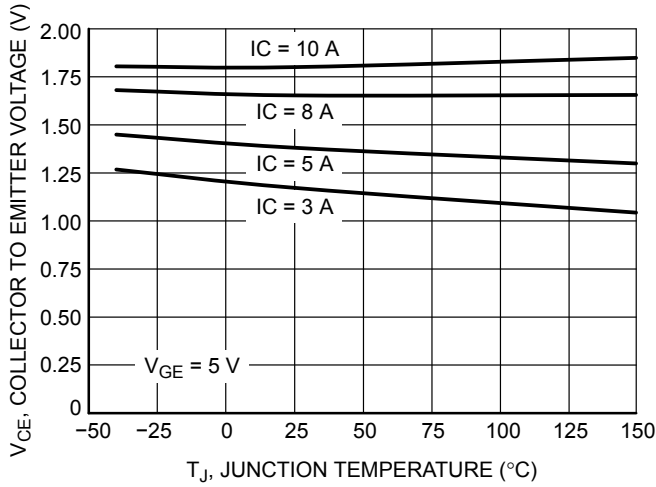


Figure 5. Collector-to-Emitter Saturation Voltage vs. Junction Temperature

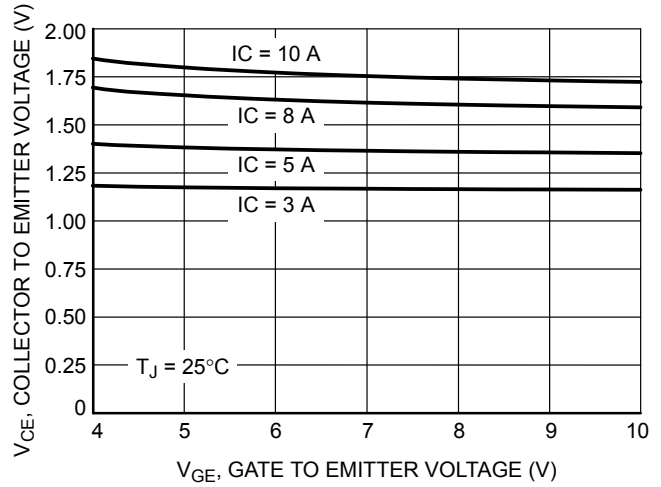


Figure 6. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

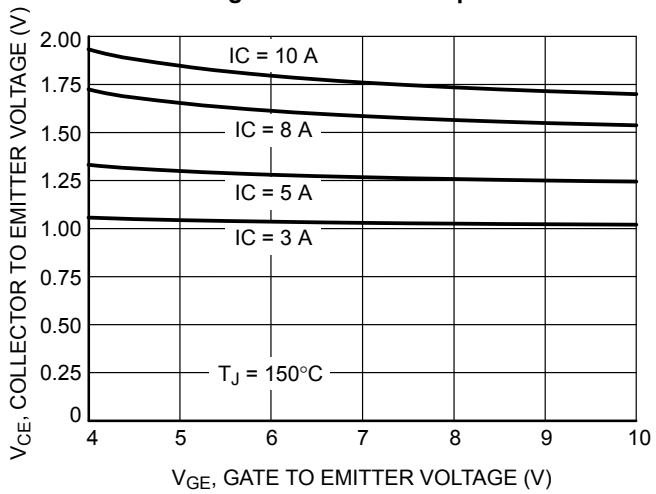


Figure 7. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

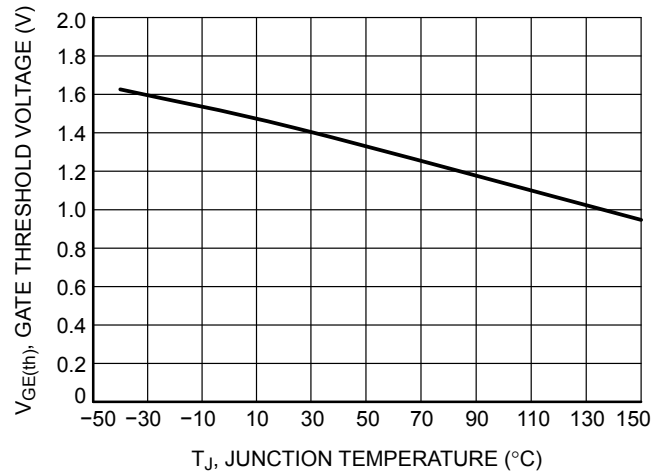
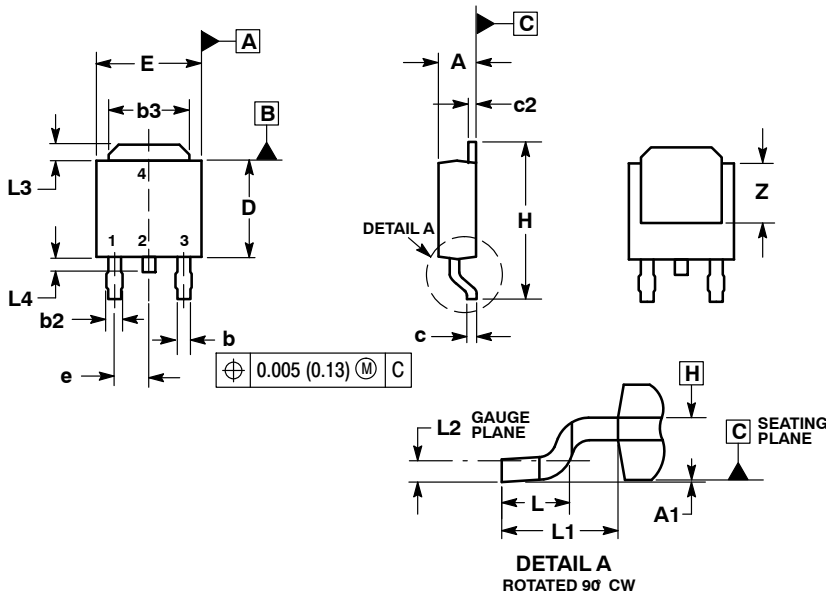


Figure 8. Gate Threshold Voltage vs. Junction Temperature

NGD8209N

PACKAGE DIMENSIONS

DPAK (SINGLE GAUGE) CASE 369C ISSUE D

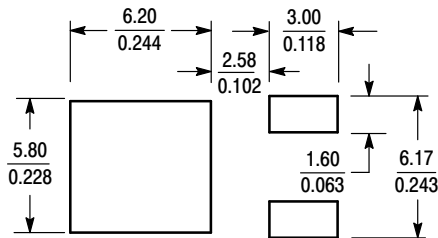


NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCHES.
3. THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSIONS b3, L3 and Z.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.006 INCHES PER SIDE.
5. DIMENSIONS D AND E ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
6. DATUMS A AND B ARE DETERMINED AT DATUM PLANE H.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.086	0.094	2.18	2.38
A1	0.000	0.005	0.00	0.13
b	0.025	0.035	0.63	0.89
b2	0.030	0.045	0.76	1.14
b3	0.180	0.215	4.57	5.46
c	0.018	0.024	0.46	0.61
c2	0.018	0.024	0.46	0.61
D	0.235	0.245	5.97	6.22
E	0.250	0.265	6.35	6.73
e	0.090 BSC		2.29 BSC	
H	0.370	0.410	9.40	10.41
L	0.055	0.070	1.40	1.78
L1	0.108 REF		2.74 REF	
L2	0.020 BSC		0.51 BSC	
L3	0.035	0.050	0.89	1.27
L4	---	0.040	---	1.01
Z	0.155	---	3.93	---

SOLDERING FOOTPRINT*



SCALE 3:1 $\left(\frac{\text{mm}}{\text{inches}} \right)$

STYLE 7:

- PIN 1. GATE
- 2. COLLECTOR
- 3. EMITTER
- 4. COLLECTOR

Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and shall not be used for, any purpose (including, without limitation, military, aerospace, medical, life-saving, life-sustaining or nuclear facility applications, devices intended for surgical implant into the body, or any other application in which the failure or lack of desired operation of the product may result in personal injury, death, or property damage) other than those expressly set forth in applicable Littelfuse product documentation. Warranties granted by Littelfuse shall be deemed void for products used for any purpose not expressly set forth in applicable Littelfuse documentation. Littelfuse shall not be liable for any claims or damages arising out of products used in applications not expressly intended by Littelfuse as set forth in applicable Littelfuse documentation. The sale and use of Littelfuse products is subject to Littelfuse Terms and Conditions of Sale, unless otherwise agreed by Littelfuse.

Littelfuse.com

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Littelfuse:](#)

[NGD8209NT4G](#)

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибьюторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

- Конкурентоспособные цены и скидки постоянным клиентам.
- Специальные условия для постоянных клиентов.
- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
- Приемлемые сроки поставки, возможна ускоренная поставка.
- Доставку товара в любую точку России и стран СНГ.
- Комплексную поставку.
- Работу по проектам и поставку образцов.
- Формирование склада под заказчика.
- Сертификаты соответствия на поставляемую продукцию (по желанию клиента).
- Тестирование поставляемой продукции.
- Поставку компонентов, требующих военную и космическую приемку.
- Входной контроль качества.
- Наличие сертификата ISO.

В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- Регистрацию проекта у производителя компонентов.
- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



Тел: +7 (812) 336 43 04 (многоканальный)

Email: org@lifeelectronics.ru