NGD15N41CL

Product Preview

Ignition IGBT
15 Amps, 410 Volts

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 Ignition, Direct Fuel Injection, or wherever high voltage and high current switching is required.

- 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
- Integrated ESD Diode Protection
- New Cell Design Increases Unclamped Inductive Switching (UIS) Energy Per Area
- Short–Circuit Withstand Capability
- Low Threshold Voltage to Interface Power Loads to Logic or Microprocessor Devices
- Low Saturation Voltage
- High Pulsed Current Capability
- Optional Gate Resistor (R_G) and Gate–Emitter Resistor (R_{GE})

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

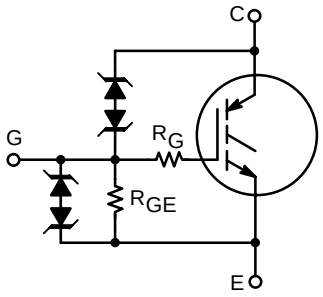
Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CES}	440	V_{DC}
Collector–Gate Voltage	V_{CER}	440	V_{DC}
Gate–Emitter Voltage	V_{GE}	15	V_{DC}
Collector Current–Continuous @ T_C = 25°C	I_C	15	A_{DC}
Operating and Storage Temperature Range	T_J, T_{stg}	–55 to 175	°C

This document contains information on a product under development. ON Semiconductor reserves the right to change or discontinue this product without notice.

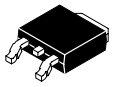
ON Semiconductor

http://onsemi.com

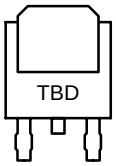
15 AMPS
410 VOLTS
$V_{CE(on)}$ = 2.1 V MAX



MARKING DIAGRAM



DPAK
CASE 369A
STYLE 2



TBD = Specific Device Code

ORDERING INFORMATION

Device	Package	Shipping
NGD15N41CL	DPAK	75 Units/Rail
NGD15N41CLT4	DPAK	2500/Tape & Reel

UNCLAMPED DRAIN–TO–SOURCE AVALANCHE CHARACTERISTICS (T_J < 150°C)

Characteristic	Symbol	Value	Unit
Single Pulse Collector–to–Emitter Avalanche Energy V_{CC} = 50 V, V_{GE} = 5 V, Pk I_L = 16 A, L = 1.8 mH, Starting T_J = 25°C V_{CC} = 50 V, V_{GE} = 5 V, Pk I_L = 15 A, L = 1.8 mH, Starting T_J = 150°C	E_{AS}	 225 200	mJ

THERMAL CHARACTERISTICS

Thermal Resistance, Junction to Ambient	DPAK	$R_{\theta JA}$	100	°C/W
Maximum Lead Temperature for Soldering Purposes, 1/8″ from case for 5 seconds		T_L	275	°C

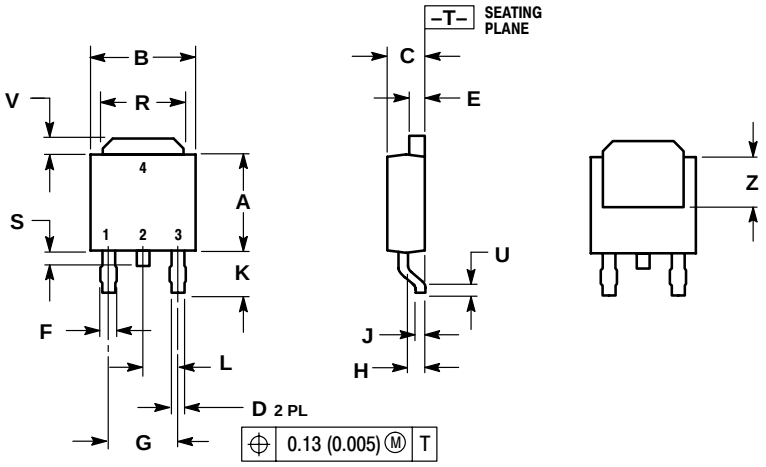
ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector–Emitter Clamp Voltage	BV_{CES}	I_C = 2 mA T_J = –40°C to 175°C	380	410	440	V_{DC}
Zero Gate Voltage Collector Current	I_{CES}	V_{CE} = 300 V, V_{GE} = 0, T_J = 25°C	–	–	40	μA_{DC}
		V_{CE} = 300 V, V_{GE} = 0, T_J = 150°C	–	–	200	
Reverse Collector–Emitter Leakage Current	I_{ECS}	V_{CE} = –24 V	–	–	1.0	mA
Gate–Emitter Clamp Voltage	BV_{GES}	I_G = 5 mA	10	–	16	V_{DC}
Gate Resistor (Optional)	R_G	–	–	70	–	Ω
Gate Emitter Resistor (Optional)	R_{GE}	–	10	–	26	kΩ
ON CHARACTERISTICS*						
Gate Threshold Voltage	$V_{GE(th)}$	I_C = 1 mA V_{GE} = V_{CE}	1.0	1.4	2.1	V_{DC}
Threshold Temperature Coefficient (Negative)	–	–	–	4.4	–	mV/°C
Collector–to–Emitter On–Voltage	$V_{CE(on)}$	I_C = 6 A, V_{GE} = 4 V	–	–	1.8	V_{DC}
Collector–to–Emitter On–Voltage	$V_{CE(on)}$	I_C = 10 A, V_{GE} = 4.5 V, T_J = 150°C	–	–	2.1	V_{DC}
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	V_{CC} = 15 V	–	700	–	pF
Output Capacitance	C_{OSS}	V_{GE} = 0 V	–	60	–	
Transfer Capacitance	C_{RSS}	f = 1 MHz	–	6.0	–	
SWITCHING CHARACTERISTICS*						
Turn–Off Delay Time	$t_{d(off)}$	V_{CC} = 300 V, I_C = 10 A	–	4.0	–	μSec
Fall Time	t_f	R_G = 1 kΩ, L = 300 μH	–	10	–	
Turn–On Delay Time	$t_{d(on)}$	V_{CC} = 10 V, I_C = 6.5 A	–	1.0	–	μSec
Rise Time	t_r	R_G = 1 kΩ, R_L = 1 Ω	–	4.0	–	

*Pulse Test: Pulse Width ≤ 300 μS, Duty Cycle ≤ 2%.

PACKAGE DIMENSIONS

DPAK
CASE 369A–13
ISSUE AA



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.235	0.250	5.97	6.35
B	0.250	0.265	6.35	6.73
C	0.086	0.094	2.19	2.38
D	0.027	0.035	0.69	0.88
E	0.033	0.040	0.84	1.01
F	0.037	0.047	0.94	1.19
G	0.180 BSC		4.58 BSC	
H	0.034	0.040	0.87	1.01
J	0.018	0.023	0.46	0.58
K	0.102	0.114	2.60	2.89
L	0.090 BSC		2.29 BSC	
R	0.175	0.215	4.45	5.46
S	0.020	0.050	0.51	1.27
U	0.020	---	0.51	---
V	0.030	0.050	0.77	1.27
Z	0.138	---	3.51	---

STYLE 2:
PIN 1. GATE
2. DRAIN
3. SOURCE
4. DRAIN

PUBLICATION ORDERING INFORMATION

NORTH AMERICA Literature Fulfillment:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303–675–2175 or 800–344–3860 Toll Free USA/Canada
Fax: 303–675–2176 or 800–344–3867 Toll Free USA/Canada
Email: ONlit@hibbertco.com
Fax Response Line: 303–675–2167 or 800–344–3810 Toll Free USA/Canada

N. American Technical Support: 800–282–9855 Toll Free USA/Canada

EUROPE: LDC for ON Semiconductor – European Support
German Phone: (+1) 303–308–7140 (Mon–Fri 2:30pm to 7:00pm CET)
Email: ONlit–german@hibbertco.com
French Phone: (+1) 303–308–7141 (Mon–Fri 2:00pm to 7:00pm CET)
Email: ONlit–french@hibbertco.com
English Phone: (+1) 303–308–7142 (Mon–Fri 12:00pm to 5:00pm GMT)
Email: ONlit@hibbertco.com

EUROPEAN TOLL–FREE ACCESS*: 00–800–4422–3781
*Available from Germany, France, Italy, UK, Ireland

CENTRAL/SOUTH AMERICA:
Spanish Phone: 303–308–7143 (Mon–Fri 8:00am to 5:00pm MST)
Email: ONlit–spanish@hibbertco.com
Toll–Free from Mexico: Dial 01–800–288–2872 for Access – then Dial 866–297–9322

ASIA/PACIFIC: LDC for ON Semiconductor – Asia Support
Phone: 303–675–2121 (Tue–Fri 9:00am to 1:00pm, Hong Kong Time)
Toll Free from Hong Kong & Singapore:
001–800–4422–3781
Email: ONlit–asia@hibbertco.com

JAPAN: ON Semiconductor, Japan Customer Focus Center
4–32–1 Nishi–Gotanda, Shinagawa–ku, Tokyo, Japan 141–0031
Phone: 81–3–5740–2700
Email: r14525@onsemi.com

ON Semiconductor Website: http://onsemi.com

For additional information, please contact your local Sales Representative.