

Dual Self-Protected Low Side Driver with Temperature and Current Limit

NCV8406DD

NCV8406DD is a dual protected Low Side Smart Discrete device. The protection features include overcurrent, overtemperature, ESD and integrated Drain to iGate clamping for overvoltage protection. This device offers protection and is suitable for harsh automotive environments.

Features

- Short Circuit Protection
- Thermal Shutdown with Automatic Restart
- Over Voltage Protection
- Integrated Clamp for Inductive Switching
- ESD Protection
- dV/dt Robustness
- Analog Drive Capability (Logic Level Input)
- These Devices are Faster than the Rest of the NCV Devices
- NCV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

Typical Applications

- Switch a Variety of Resistive, Inductive and Capacitive Loads
- Can Replace Electromechanical Relays and Discrete Circuits
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MAXIMUM RATINGS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Rating	Symbol	Value	Unit
Drain to Source Voltage Internally Clamped	V_{DSS}	60	Vdc
Gate to Source Voltage	V_{GS}	± 14	Vdc
Drain Current Continuous	I_D	Internally Limited	
Power Dissipation per Channel, both channels loaded equally @ $T_A = 25^\circ\text{C}$ (Note 1) @ $T_A = 25^\circ\text{C}$ (Note 2)	P_D	0.57 0.78	W
Total Power Dissipation, only one channel loaded @ $T_A = 25^\circ\text{C}$ (Note 1) @ $T_A = 25^\circ\text{C}$ (Note 2)	P_D	0.93 1.2	W
Thermal Resistance, both channels loaded equally Junction to Ambient (Note 1) Junction to Ambient (Note 2) Junction to Case (Soldering Point)	R_{JA} R_{JA} R_{JS}	107.8 79.4 29	$^\circ\text{C/W}$
Thermal Resistance, only one channel loaded Junction to Ambient (Note 1) Junction to Ambient (Note 2) Junction to Case (Soldering Point)	R_{JA} R_{JA} R_{JS}	133.6 103.8 29	$^\circ\text{C/W}$
Single Pulse Inductive Load Switching Energy (Starting $T_J = 25^\circ\text{C}$, $V_{DD} = 50\text{ Vdc}$, $V_{GS} = 5.0\text{ Vdc}$, $I_L = 2.1\text{ Apk}$, $L = 50\text{ mH}$, $R_G = 25\ \Omega$)	E_{AS}	110	mJ
Load Dump Voltage ($V_{GS} = 0$ and 10 V , $R_I = 2\ \Omega$, $R_L = 7\ \Omega$, $t_d = 400\text{ ms}$)	V_{LD}	75	

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MOSFET ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise noted)

Parameter	Test Condition	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain to Source Clamped Breakdown Voltage	(V _{GS} = 0 V, I _D = 2 mA)	V _{(BR)DSS}	60	65	70	V
Zero Gate Voltage Drain Current	(V _{DS} = 52 V, V _{GS} = 0 V)	I _{DSS}	ï	22	100	A
Gate Input Current	(V _{GS} = 5.0 V, V _{DS} = 0 V)	I _{GSS}				

TYPICAL PERFORMANCE CURVES

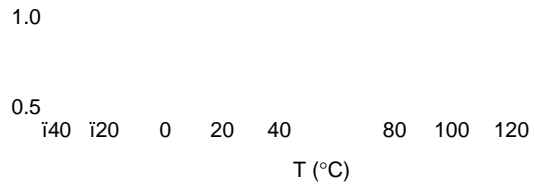


Figure 8. Normalized $R_{DS(on)}$ vs. Temperature

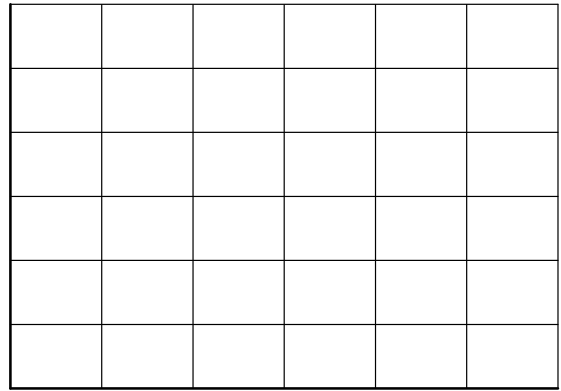
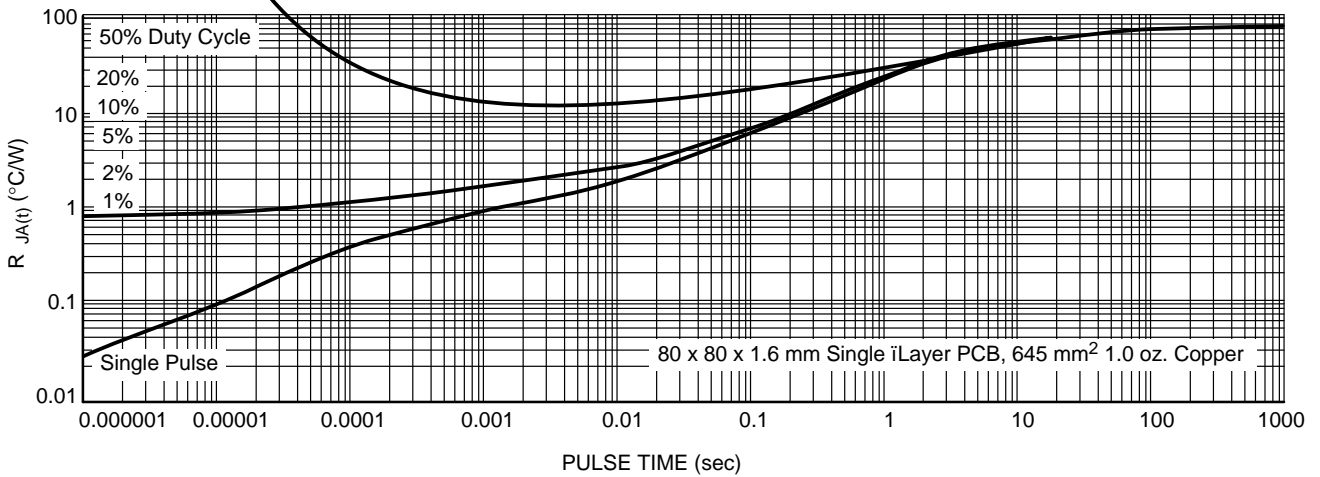
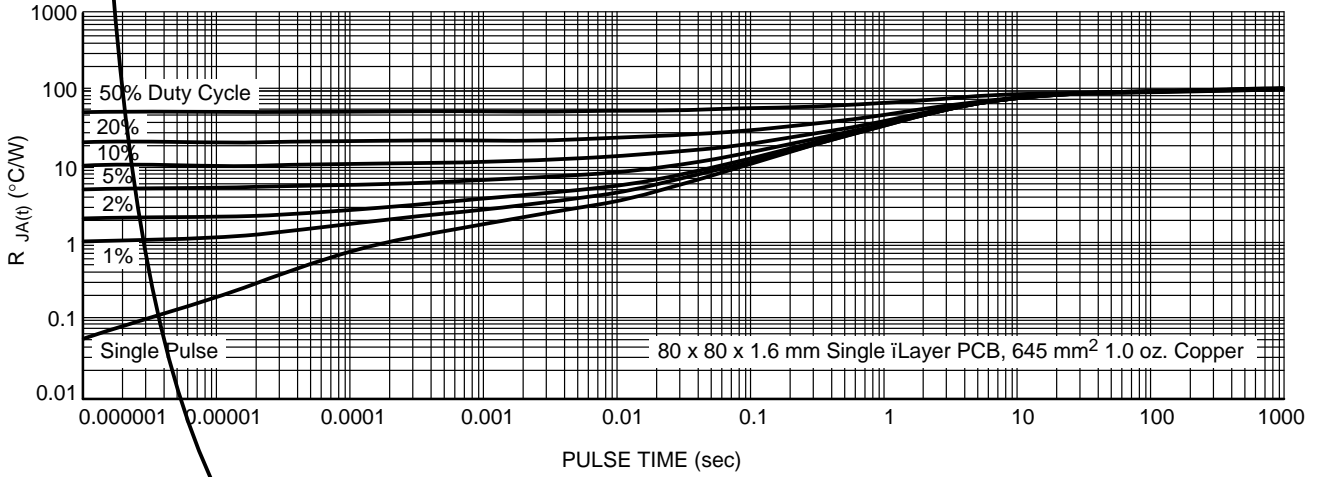
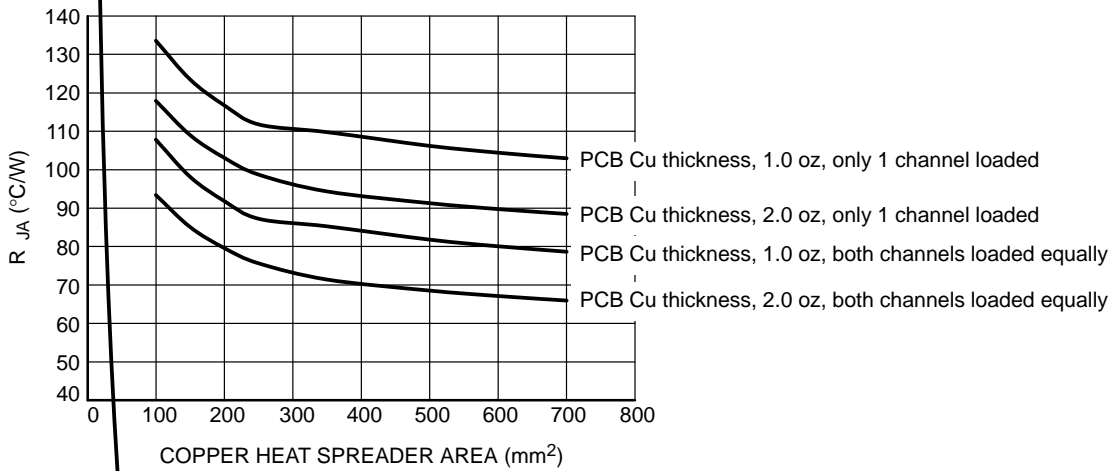


Figure 9. Current Limit vs. Gate Voltage

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TYPICAL PERFORMANCE CURVES



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TEST CIRCUITS AND WAVEFORMS

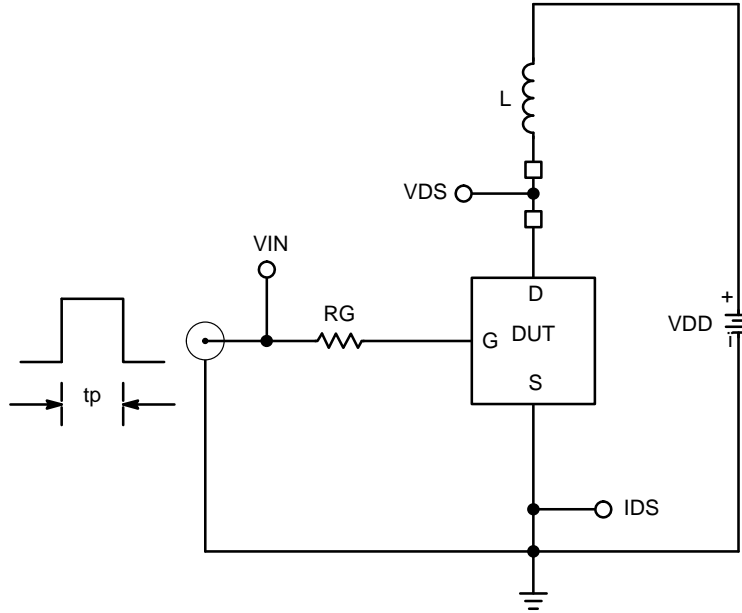


Figure 22. Inductive Load Switching Test Circuit

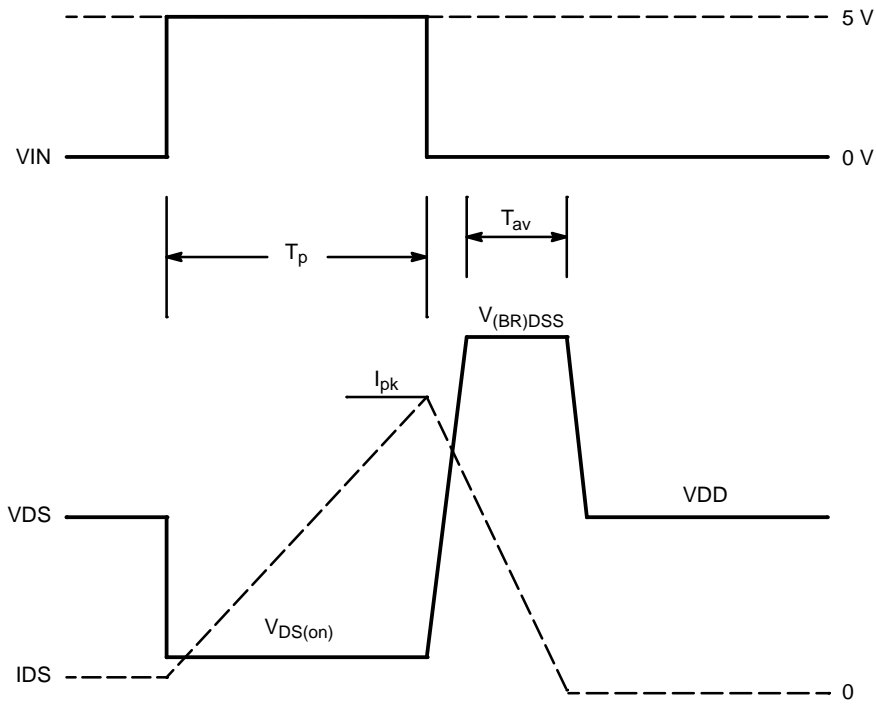


Figure 23. Inductive Load Switching Waveforms

ORDERING INFORMATION

Device	Package	Shipping †
NCV8406DD1CR2G	SOIC i8 (Pb iFree)	2500 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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PACKAGE DIMENSIONS

SOIC 8 NB
CASE 751 07
ISSUE AK

