

**Table 1. Absolute Maximum Rating**

Symbol	Parameter	Value	Unit
$V_{CC}$	DC Supply voltage	45	V
$-I_{GND}$	DC ground pin reverse current TRAN Ground pin reverse current ( pulse duration < 1ms)	-250 -6	mA A
$I_{OUT}$	DC Output current	Internally limited	A
$-I_{OUT}$	Reverse DC output current	-2	A
$I_{IN}$	DC Input current	$\pm 10$	mA
$V_{IN}$	Input voltage range	$-3/+V_{CC}$	V
$V_{ESD}$	Electrostatic discharge (R = 1.5KW; C = 100pF)	2000	V
$P_{TOT}$	Power dissipation at $T_c = 25^\circ\text{C}$	96	W
$L_{MAX}$	Max inductive load ( $V_{CC} = 24\text{V}$ , $R_{LOAD} = 48\Omega$ , $T_A = 100^\circ\text{C}$ )	2	H
$T_J$	Junction operating temperature	Internally limited	$^\circ\text{C}$
$T_C$	Case operating temperature	Internally limited	$^\circ\text{C}$
$T_{STG}$	Storage Temperature	-55 to 150	$^\circ\text{C}$

**Table 2. Pin Definitions and Functions**

Pin No.	Symbol	Function
TAB	$V_{CC}$	Positive power supply voltage
1	$V_{CC}$	Positive power supply voltage
2,3,4,5	NC	Not connected
6	Input 1	Input of channel 1
7	Input 2	Input of channel 2
8	Input 3	Input of channel 3
9	Input 4	Input of channel 4
10	Input 5	Input of channel 5
11	Input 6	Input of channel 6
12	Input 7	Input of channel 7
13	Input 8	Input of channel 8
14,15,16,17,18	NC	Not connected
19	GND	Logic ground
20	STATUS	Common open source diagnostic for over-temperature
21,22	Output 8	High-Side output of channel 8
23,24	Output 7	High-Side output of channel 7
25,26	Output 6	High-Side output of channel 6
27,28	Output 5	High-Side output of channel 5
29,30	Output 4	High-Side output of channel 4
31,32	Output 3	High-Side output of channel 3
33,34	Output 2	High-Side output of channel 2
35,36	Output 1	High-Side output of channel 1

Figure 1. Connection Diagram (Top View)

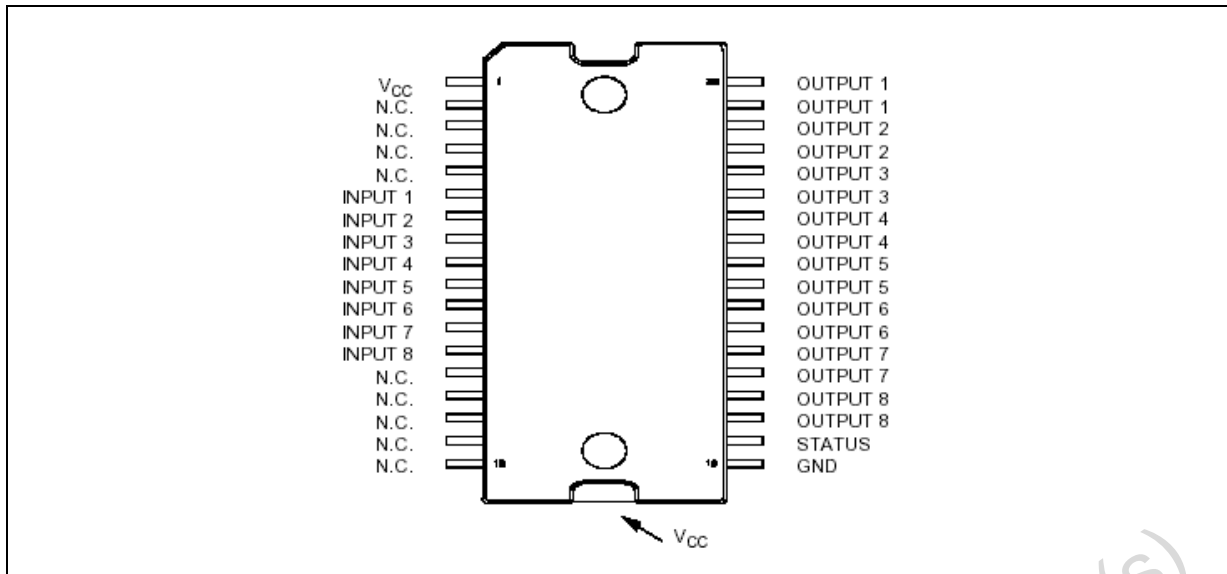
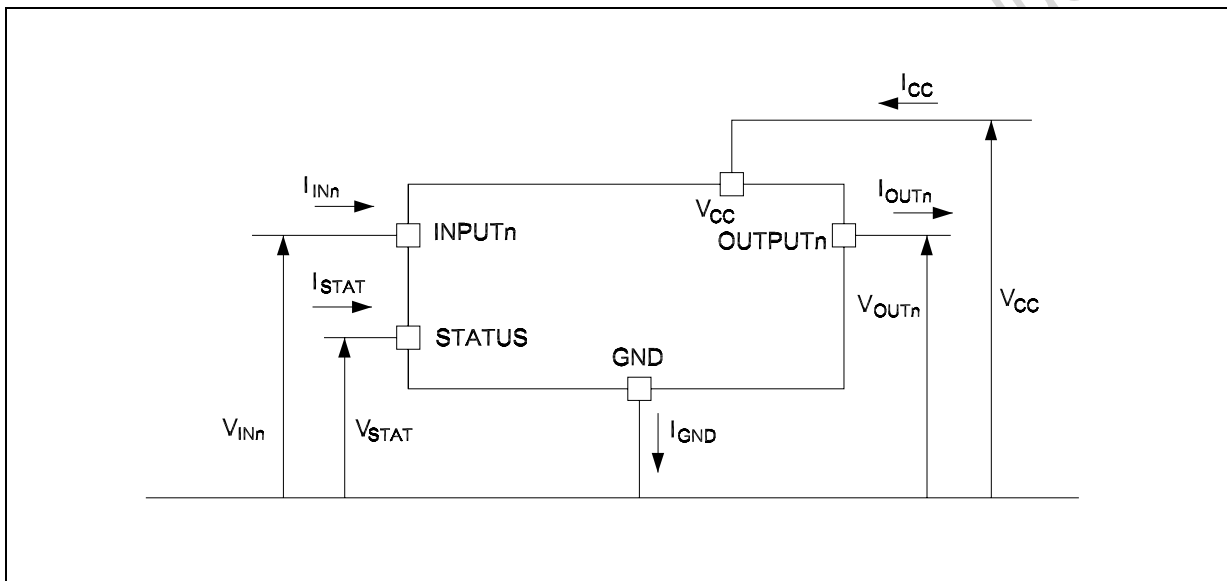


Figure 2. Current and Voltage Conventions



**Table 3. Thermal data**

Symbol	Parameter		Value	Unit
$R_{thJC}$	Thermal resistance junction-case	Max	1.3	°C/W
$R_{thJA}$	Thermal resistance junction-ambient <i>Note:1</i>	Max	50	°C/W

*Note:* 1. When mounted on FR4 printed circuit board with 0.5cm<sup>2</sup> of copper area ( at least 35μ think ) connected to all TAB pins.

**Electrical Characteristics** (10.5V < V<sub>CC</sub> < 32V; -40°C < T<sub>J</sub> < 100°C; unless otherwise specified)

**Table 4. Power Section**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V <sub>CC</sub>	Operating supply voltage		10.5		45	V
V <sub>USD</sub>	Undervoltage shutdown		7		10.5	V
R <sub>ON</sub>	On state resistance	I <sub>OUT</sub> = 0.5A; T <sub>J</sub> = 25°C I <sub>OUT</sub> = 0.5A;		150	185 280	mΩ mΩ
I <sub>S</sub>	Supply current	OFF state; V <sub>CC</sub> = 24V; T <sub>CASE</sub> = 25°C ON state( all channels ON); V <sub>CC</sub> = 24V T <sub>CASE</sub> = 100°C			150 12	μA mA
I <sub>LGND</sub>	Output current at turn-off	V <sub>CC</sub> = V <sub>STAT</sub> = V <sub>IN</sub> = V <sub>GND</sub> = 24V V <sub>OUT</sub> = 0V			1	mA
I <sub>L(off)</sub>	OFF state output current	V <sub>IN</sub> = V <sub>OUT</sub> = 0V;	0		5	μA
V <sub>OUT(off)</sub>	OFF state output voltage	V <sub>IN</sub> = 0V, I <sub>OUT</sub> = 0A			3	V
t <sub>d(Vccon)</sub>	Power-on delay time from V <sub>CC</sub> rising edge	<i>Figure 6.</i>		1		ms

**Table 5. Switching ( V<sub>CC</sub> = 24V )**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
t <sub>ON</sub>	Turn-on time	R <sub>L</sub> = 48Ω from 80% V <sub>OUT</sub> <i>Figure 5.</i>		50	100	μs
t <sub>OFF</sub>	Turn-off time	R <sub>L</sub> = 48Ω to 10% V <sub>OUT</sub> <i>Figure 5.</i>		75	150	μs
dV <sub>OUT</sub> /dt <sub>(on)</sub>	Turn-on voltage slope	R <sub>L</sub> = 48Ω from V <sub>OUT</sub> = 2.4V to V <sub>OUT</sub> = 19.2V <i>Figure 5.</i>		0.7		V/μs
dV <sub>OUT</sub> /dt <sub>(off)</sub>	Turn-off voltage slope	R <sub>L</sub> = 48Ω from V <sub>OUT</sub> = 21.6V to V <sub>OUT</sub> = 2.4V <i>Figure 5.</i>		1.5		V/μs

**Table 6. Input Pin**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{INL}$	Input low level				$V_{CC}/2-1$	V
$I_{INL}$	Low level input current	$V_{IN} = V_{CC}/2 - 1V$	80			$\mu A$
$V_{INH}$	Input high level		$V_{CC}/2+1$			V
$I_{INH}$	High level input current	$V_{IN} = V_{CC}/2 + 1V$		150	260	$\mu A$
$V_{I(HYST)}$	Input hysteresis voltage			0.6		V
$I_{IN}$	Input current	$V_{IN} = V_{CC} = 32V$			300	$\mu A$

**Table 7. Protections**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$T_{CSD}$	Case shut-down temperature		125	130	135	$^{\circ}C$
$T_{CR}$	Case reset temperature		110			$^{\circ}C$
$T_{CHYST}$	Case thermal hysteresis		7	15		$^{\circ}C$
$T_{TSD}$	Junction shutdown temperature		150	175	200	$^{\circ}C$
$T_R$	Junction reset temperature		135			$^{\circ}C$
$T_{HYST}$	Junction thermal hysteresis		7	15		$^{\circ}C$
$I_{lim}$	DC Short circuit current	$V_{CC} = 24V$ ; $R_{LOAD} = 10m\Omega$	0.7		1.7	A
$V_{demag}$	Turn-off output clamp voltage	$I_{OUT} = 0.5A$ ; $L = 6mH$	$V_{CC}-57$	$V_{CC}-52$	$V_{CC}-47$	V

**Table 8. Status Pin**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{HSTAT}$	High level output current	$V_{CC} = 18...32V$ ; $R_{STAT} = 1K\Omega$ ( Fault condition )	2	3	4	mA
$I_{LSTAT}$	Leakage current	Normal operation; $V_{CC} = 32V$			0.1	$\mu A$
$V_{CLSTAT}$	Clamp voltage	$I_{STAT} = 1mA$	6.0	6.8	8.0	V
		$I_{STAT} = -1mA$		-0.7		V

Figure 3. Equivalent Internal Block Diagram ( same structure for all channel )

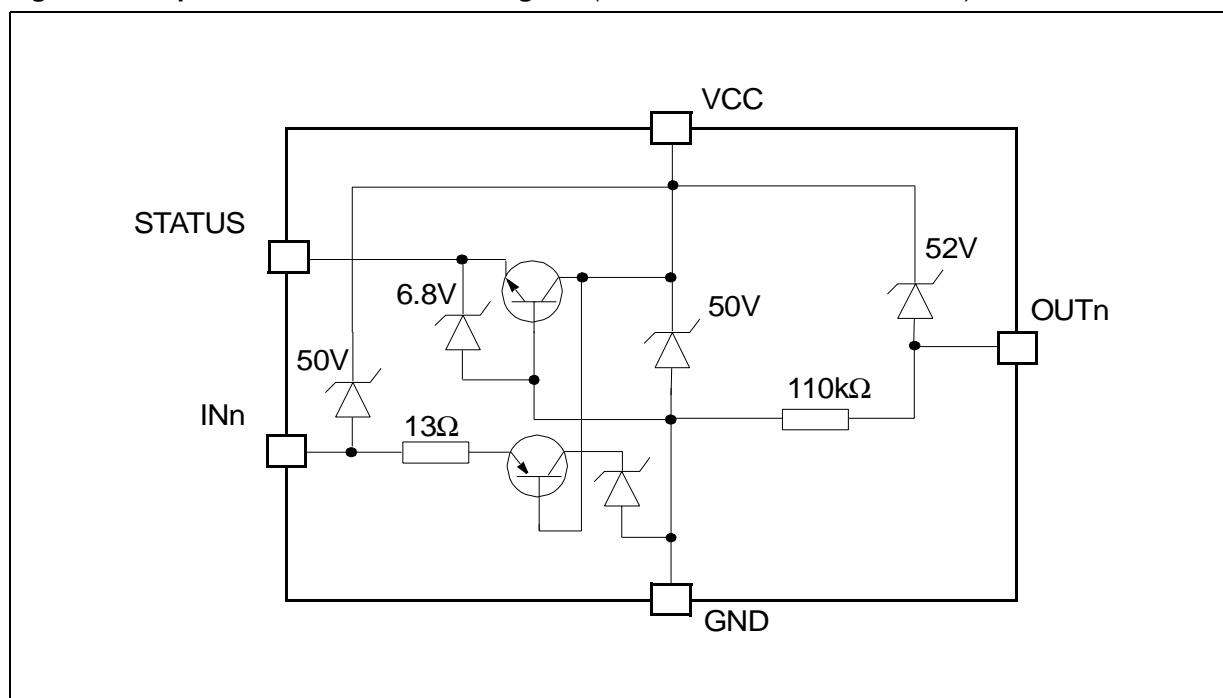
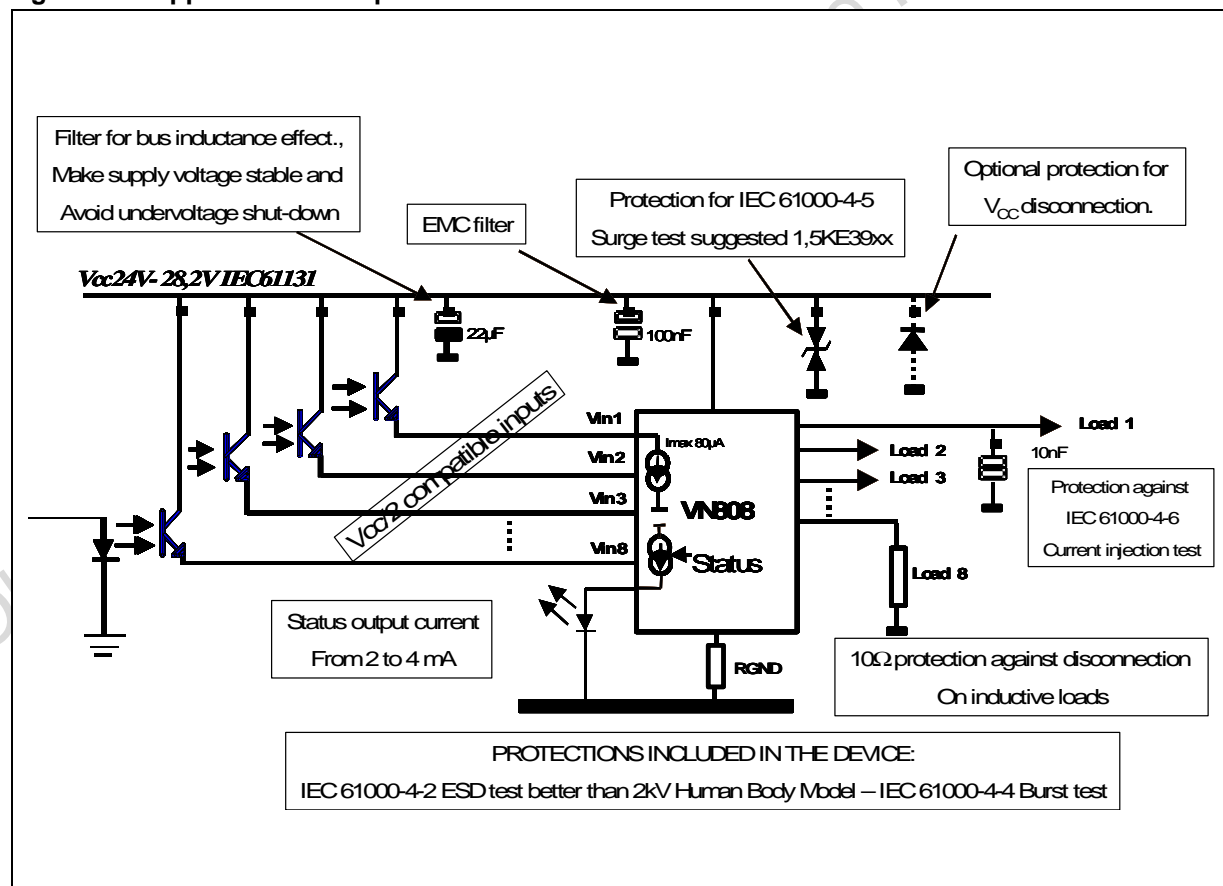


Figure 4. Application Example



## Switching Time Waveforms

Figure 5. Turn-on & Turn-off

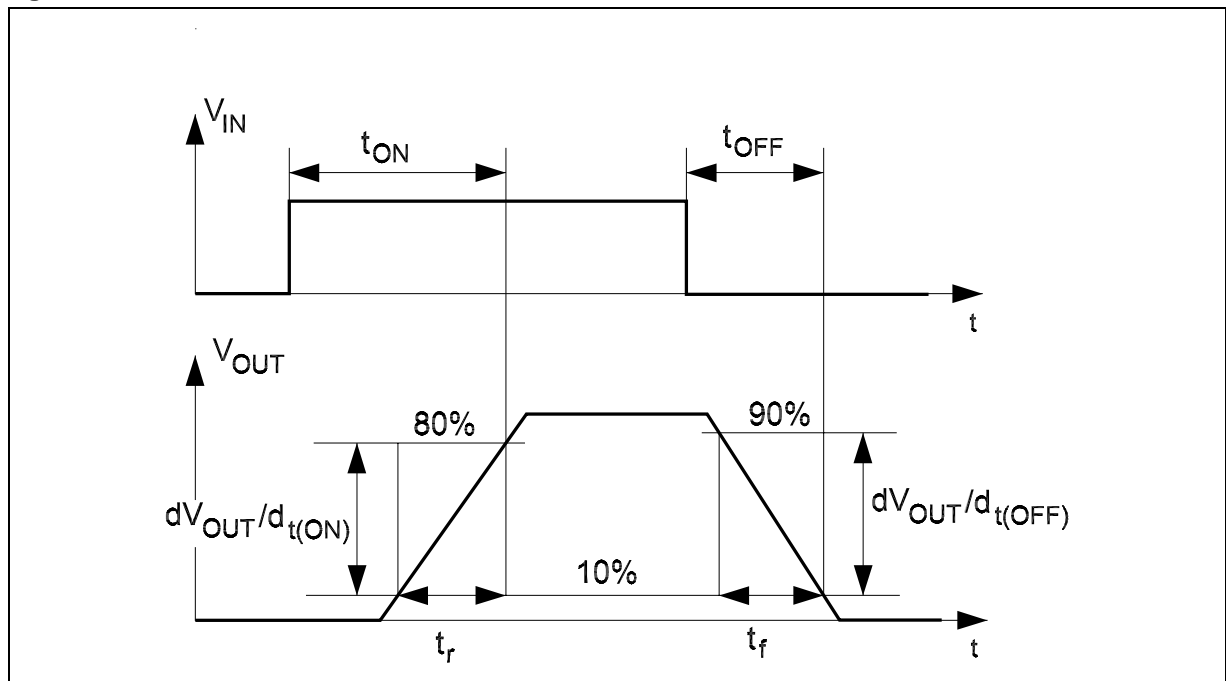
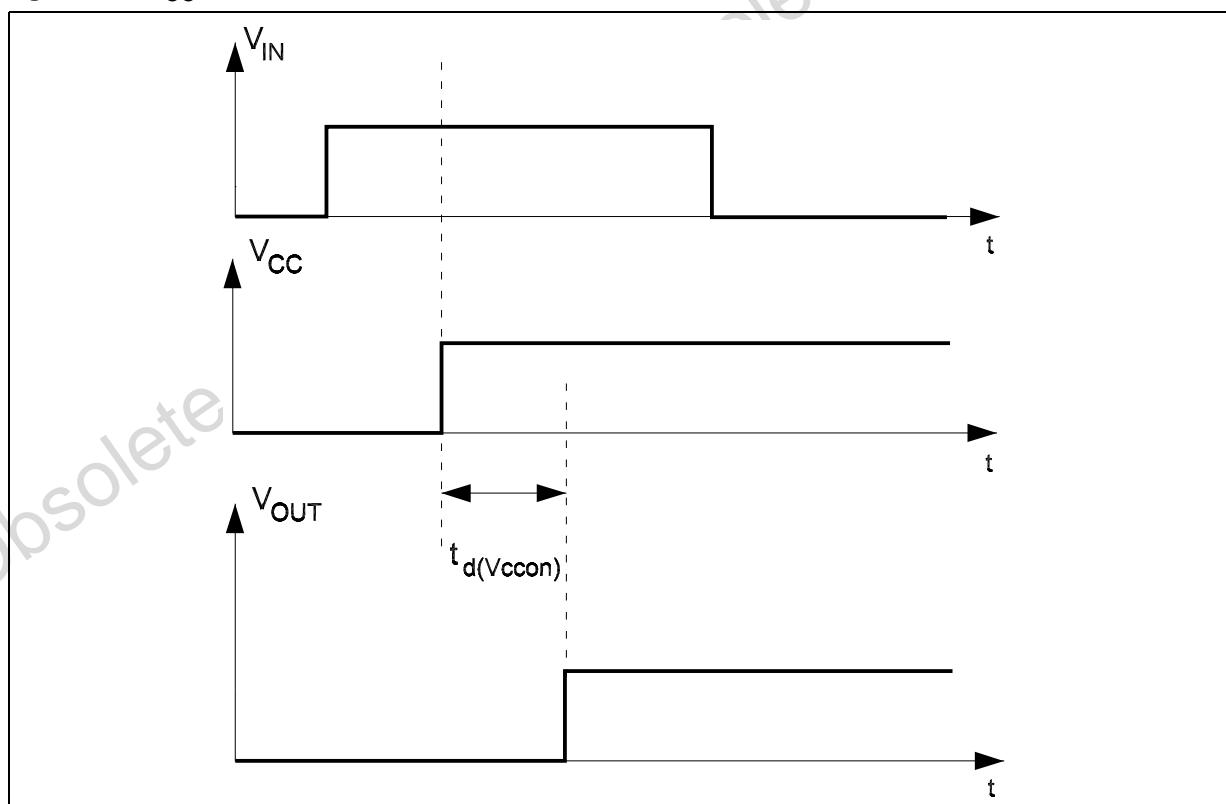


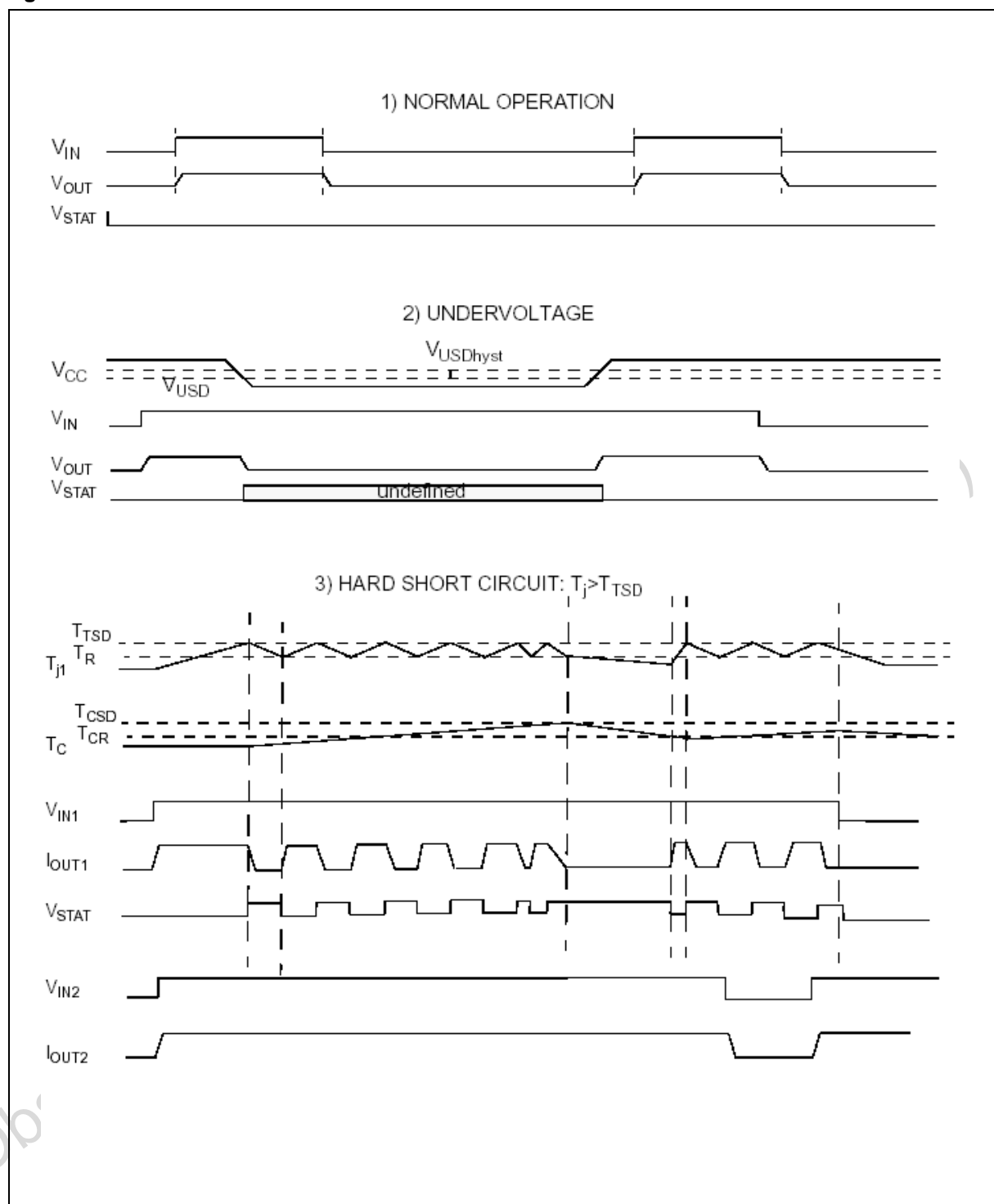
Figure 6.  $V_{CC}$  Turn-on

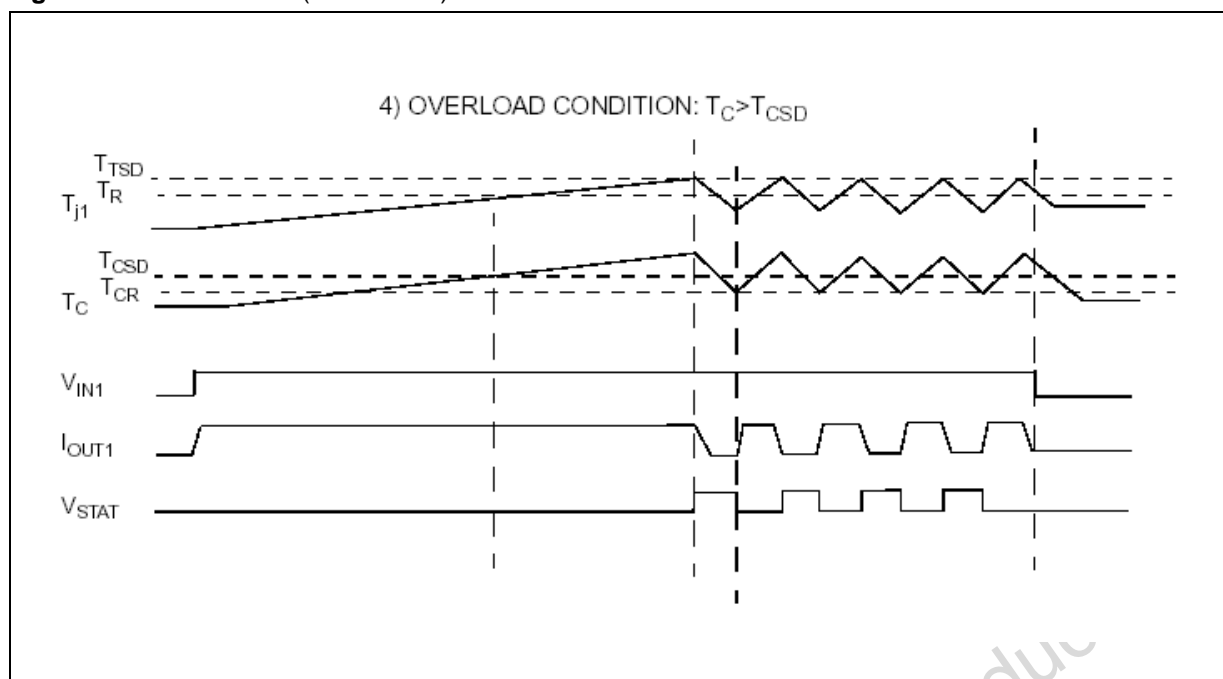


**Table 9. Truth Table**

Conditions	INPUTn	OUTPUTn	STATUS
Normal operation	L	L	L
	H	H	L
Current limitation	L	L	L
	H	X	L
Overtemperature (see waveforms 3, 4 <a href="#">Figure 7</a> . <a href="#">Figure 8</a> .) -> $T_J > T_{TSD}$	L	L	L
	H	L	H
Undervoltage	L	L	X
	H	L	X

Figure 7. Waveforms



**Figure 8. Waveforms ( continued )**

## **Mechanical Data**

In order to meet environmental requirements, ST offers these devices in ECOPACK<sup>®</sup> packages. These packages have a Lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: [www.st.com](http://www.st.com)

Obsolete Product(s) - Obsolete Product(s)



## VN808

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**Table 11. Order Codes**

Package	Tube	Tape and Reel
PowerSO-36	VN808	VN80813TR

Obsolete Product(s) - Obsolete Product(s)

**Table 12. Revision History**

Date	Revision	Changes
13-Sep-2005	4	Final release

Obsolete Product(s) - Obsolete Product(s)

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