

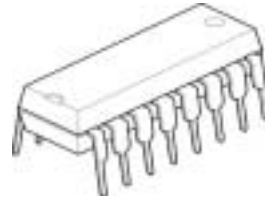
## H BRIDGE DRIVER

### ■ GENERAL DESCRIPTION

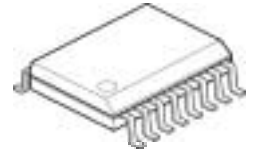
The NJM2675 is a general-purpose 60V single H-bridge drive IC. It consists of a H-bridge, a thermal shut down circuit and its alarm output. The alarm output can detect application problems and the system reliability will be significantly improved if monitored by Microprocessor.

Therefore, it is suitable for DC motor application driven by Microprocessor.

### ■ PACKAGE OUTLINE



NJM2675D

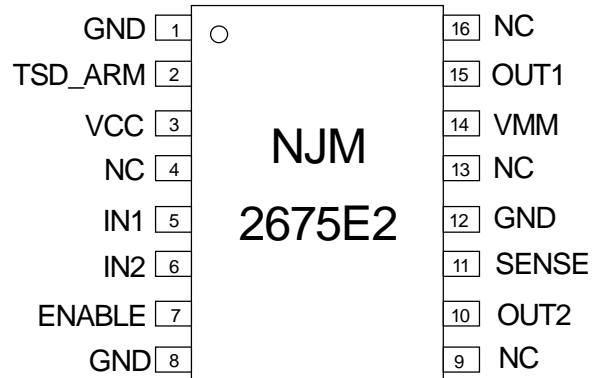
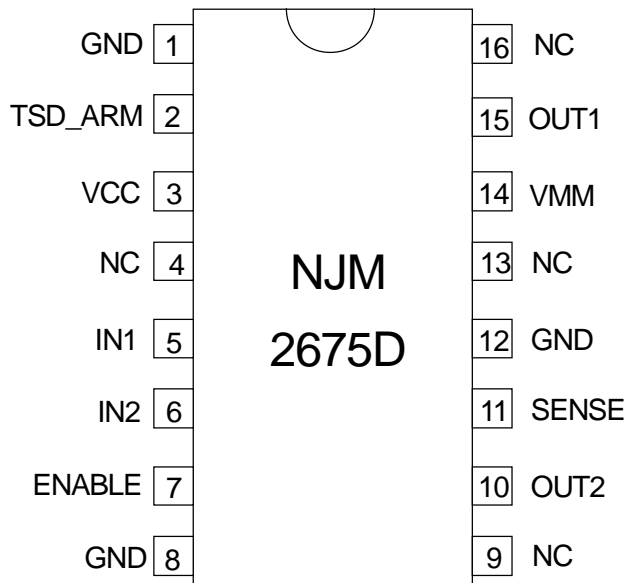


NJM2675E2

### ■ FEATURE

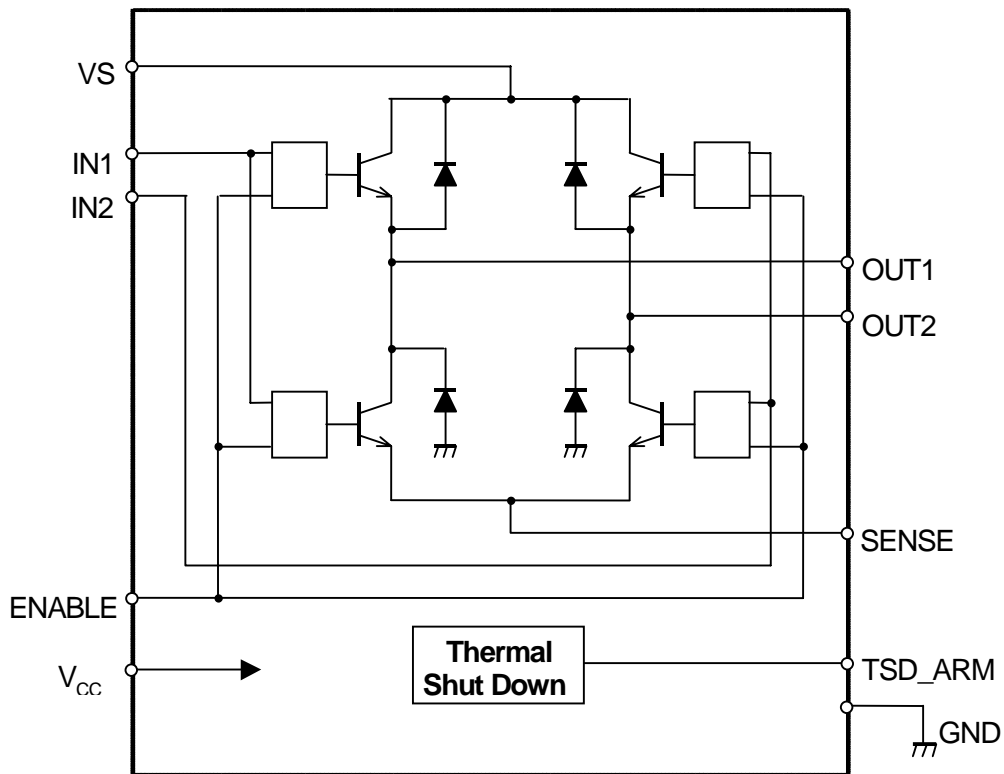
- Wide Voltage Range 4V to 55V
- Wide Range of Current Control 5 to 1200mA
- Thermal Shut Down Circuit (with Alarm Output)
- Dead Band Protector
- Package Outline DIP16 / EMP16

### ■ PIN CONNECTION



# NJM2675

## ■ BLOCK DIAGRAM



## ■ PIN DESCRIPTION

Pin No.	Symbol	Description
1	GND	Ground (This terminal has to be connected to pin8 and pin12)
2	TSD_ARM	Thermal shut down alarm output
3	VCC	Logic supply voltage
4	NC	No connect
5	IN1	Logic control signal input
6	IN2	Logic control signal input
7	ENABLE	Output ON/OFF control
8	GND	Ground (This terminal has to be connected to pin1 and pin12.)
9	NC	No connect
10	OUT2	Motor output 2
11	SENSE	Current cense
12	GND	Ground (This terminal has to be connected to pin8 and pin12.)
13	NC	No connect
14	VMM	Motor supply voltage
15	OUT1	Motor output
16	NC	No connect

## ■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Maximum Supply Voltage	$V_{MM}$	60	V
Logic Supply Voltage	$V_{CC}$	7	V
Input Voltage Range	$V_{IN}$	-0.3 to 7	V
Output Current	$I_{OUT}$	1.5	A
Power dissipation (DIP package)	$P_D$	1.2	W
Power dissipation (EMP package)	$P_D$	1.3 (Note1)	W
Operating Junction Temperature	$T_{opr}$	-40 ~ 85	°C
Storage Temperature	$T_{stg}$	-55 ~ 150	°C

Note1 Specified board : EIA / JEDEC specification (76. 2×114.3×h1.6mm, 2-layer, FR4)

## ■ RECOMENENDO OPERATING CONDITIONS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Supply Voltage	$V_{MM}$		4	-	55	V
Logic Voltage Range	$V_{CC}$		4.75	5.00	5.25	V
Maximum Output Current	$I_{OUT}$		-	-	1.2	A
Operating junction temperature	$T_J$		-20	-	125	°C

## ■ ELECTRICAL CHARACTERISTICS

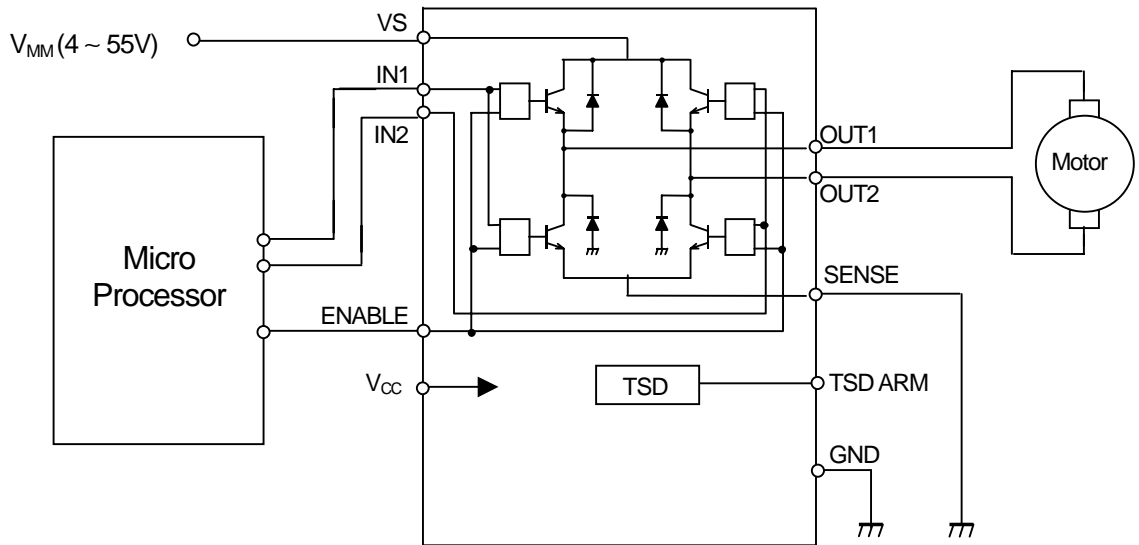
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
GENERAL						
Quiescent current	$I_{cc}$	Enable=H, IN1=L, IN2=H	-	20	-	mA
Thermal shutdown	$T_{tsd}$		-	170	-	°C
Off-State leak current	$I_{tsd-LEAK}$	TSD ARM=5V	-	-	50	μA
Thermal alarm output saturation	$V_{tsd}$	$I_o=5mA$	-	0.5	0.7	V
Dead time protection	$T_d$		-	1	-	μs
LOGIC						
Input LOW voltage	$V_{iL}$		-	-	0.6	V
Input HIGH voltage	$V_{iH}$		2	-	-	V
Input HIGH current	$I_{iH}$	$V_i=2.4V$	-	-	20	μA
Input LOW current	$I_{iL}$	$V_i=0.4V$	-0.4	-	-	mA
OUTPUT						
Upper transistor saturation	$V_{OU1}$	$I_o=1000mA$	-	1.3	1.5	V
	$V_{OU2}$	$I_o=1300mA$	-	1.5	1.8	V
Lower transistor saturation	$V_{OL1}$	$I_o=1000mA$	-	0.5	0.8	V
	$V_{OL2}$	$I_o=1300mA$	-	0.8	1.3	V
Upper diode forward	$V_{fU1}$	$I_o=1000mA$	-	1.3	1.6	V
	$V_{fU2}$	$I_o=1300mA$	-	1.6	1.9	V
Lower diode forward	$V_{fL1}$	$I_o=1000mA$	-	1.3	1.6	V
	$V_{fL2}$	$I_o=1300mA$	-	1.6	1.9	V
Output leakage current	$I_{O-LEAK}$	$V_{MM}=50V$	-	-	1	mA
Upper diode recovery time	$T_{rrU}$		-	250	-	ns
Lower diode recovery time	$T_{rrL}$		-	250	-	ns

# NJM2675

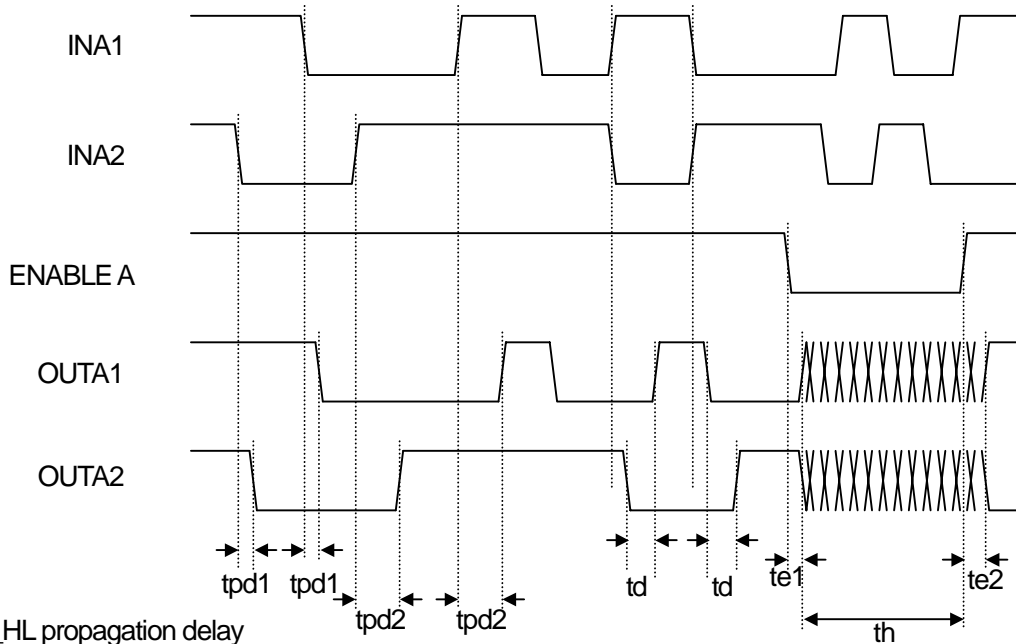
## ■ TRUTH TABLE

INPUT (L=Low,H=High,X=Don't care)			OUTPUT (H=Source,L=Sink)		OUTPUT mode
ENABLE A=H ENABLE B=H	INA1 INB1	INA2 INB2	OUTA1 OUTB1	OUTA2 OUTB2	
	L	L	L	L	short break mode
	L	H	L	H	CW
	H	L	H	L	CCW
	H	H	H	H	short break mode
ENABLE A=L ENABLE B=L	X	X	All Transistor turned OFF		

## ■ TYPICAL APPLICATION



## ■ TIMING CHART



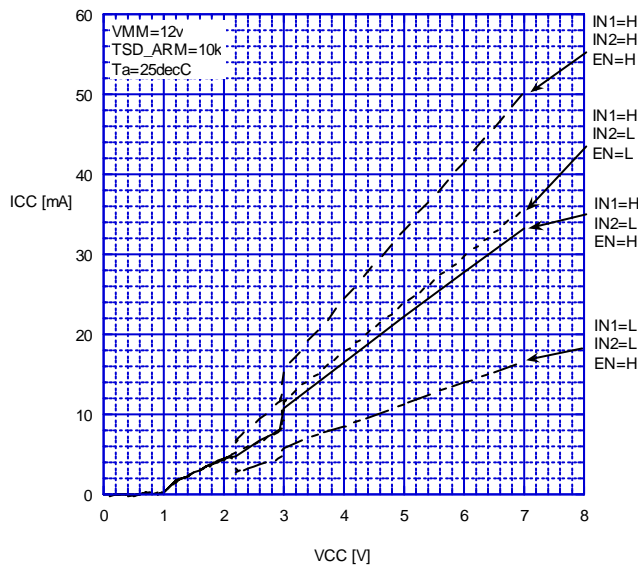
- tpd1: IN\_HL propagation delay
- tpd2: IN\_LH propagation delay
- td : Output dead band protection delay
- te1 : ENABLE\_HL propagation delay
- te2 : ENABLE\_LH propagation delay
- th : Output High impedance section

	Reference value	unit
tpd1	1.0	us
tpd2	2.5	us
td	1.5	us
te1	3.5	us
te2	2.0	us

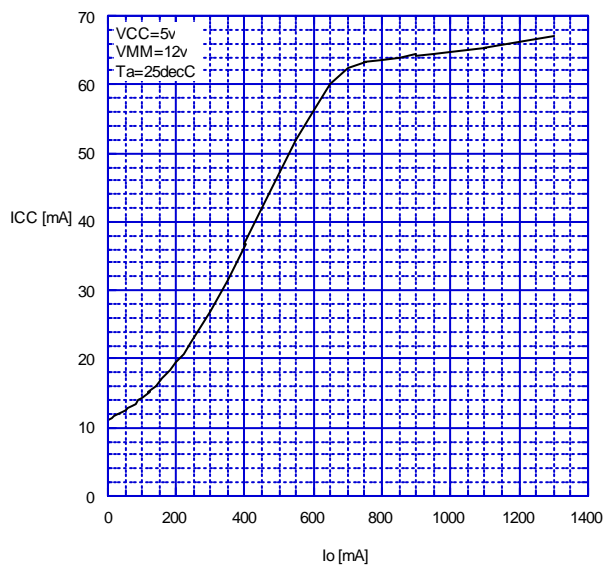
# NJM2675

## TYPICAL CHARACTERISTICS 1

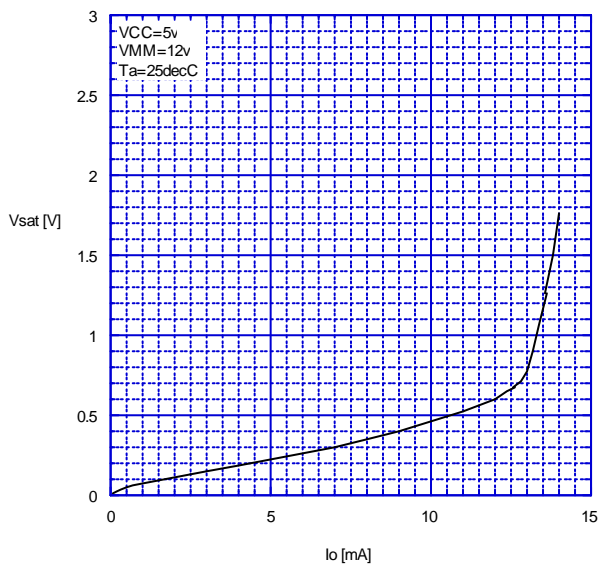
ICC vs. VCC



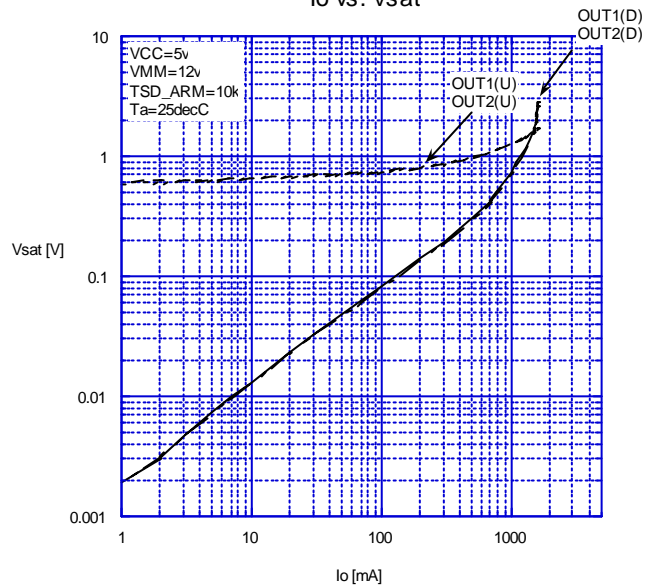
Io vs. ICC



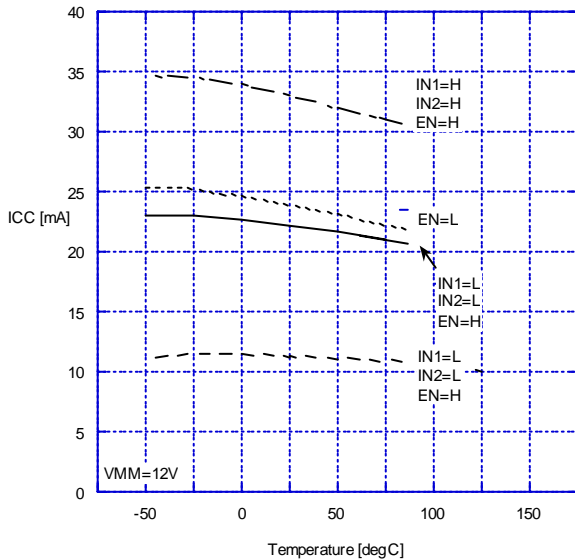
Io vs. Vsat-TSD\_ARM



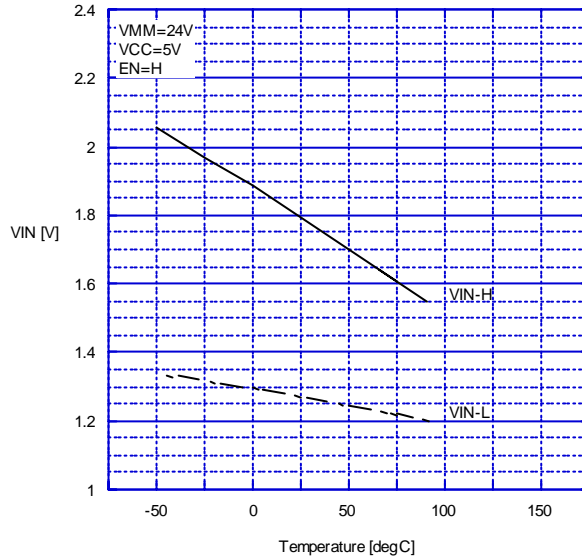
Io vs. Vsat



ICC vs. Temperature

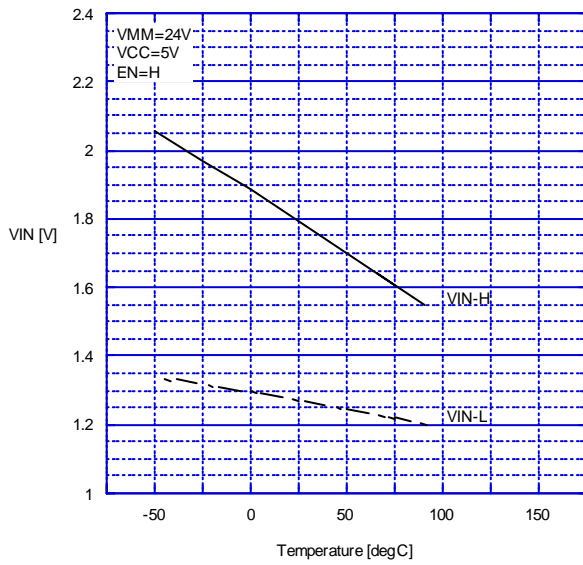


VIN vs. Temperature

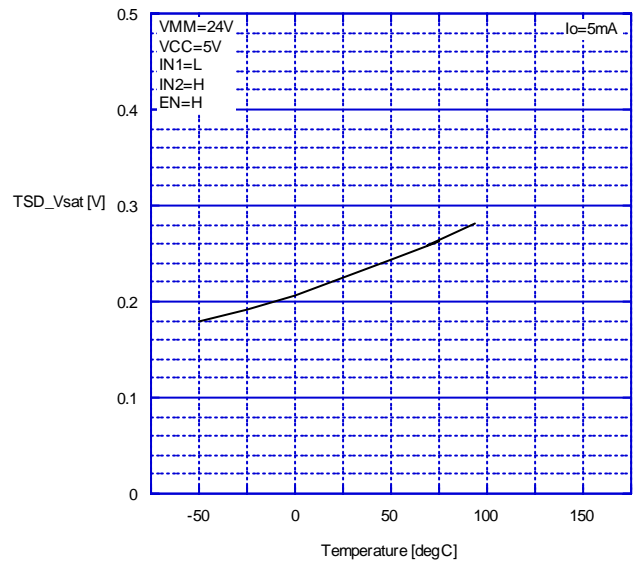


## ■ TYPICAL CHARACTERISTICS 2

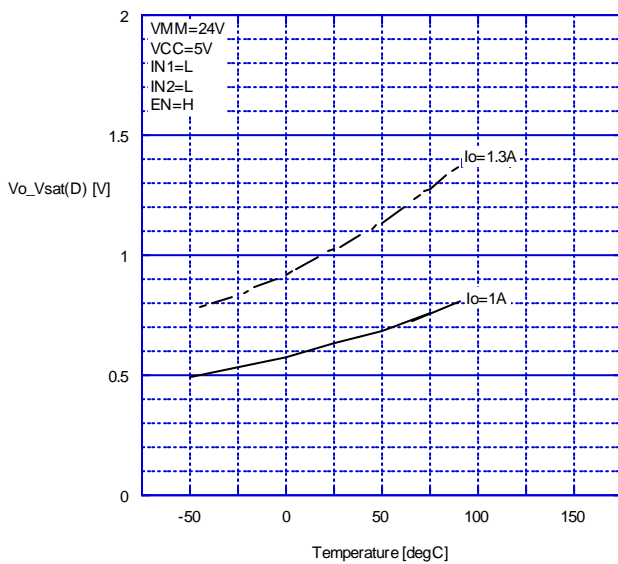
VIN vs. Temperature



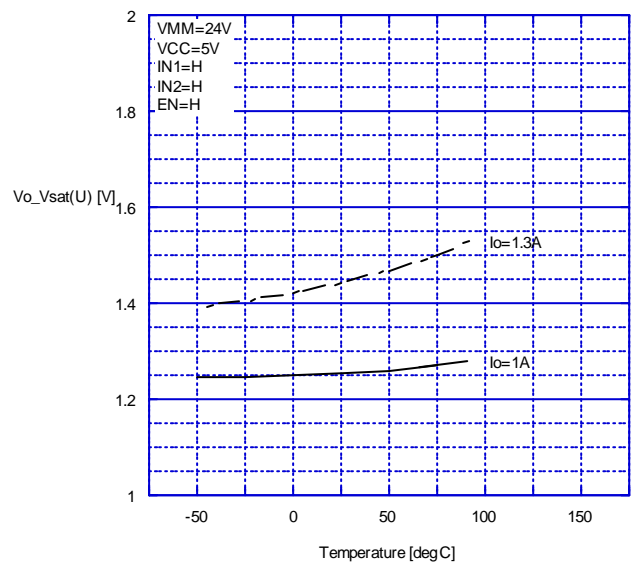
TSD\_Vsat vs. Temperature



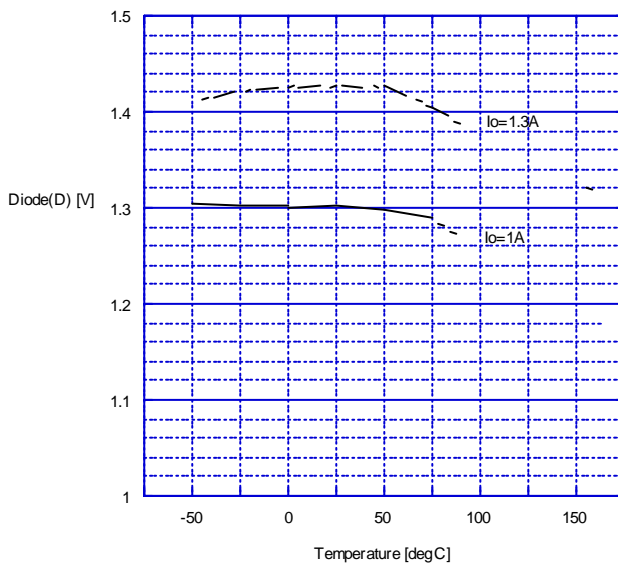
Vo\_Vsat(D) vs. Temperature



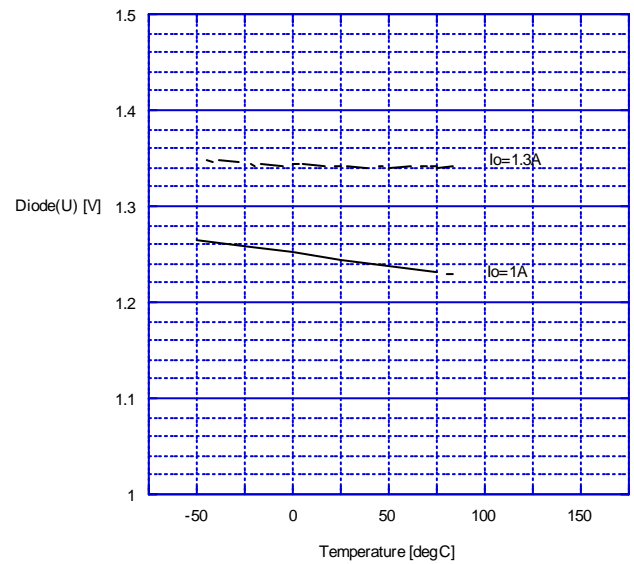
Vo\_Vsat(U) vs. Temperature



Diode(D) vs. Temperature

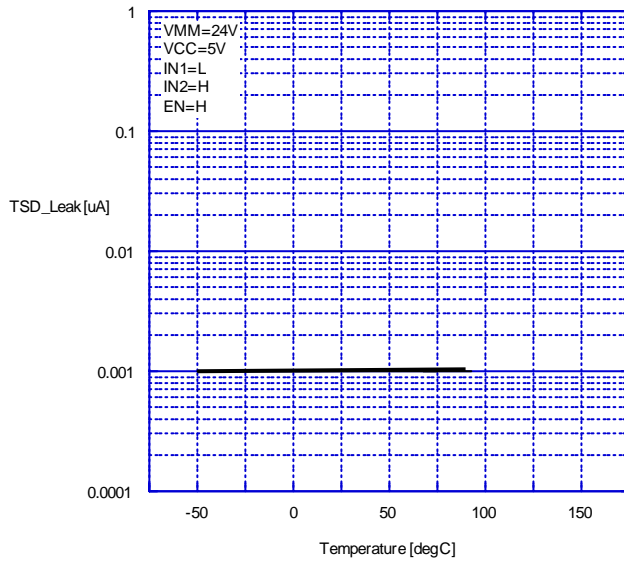


Diode(U) vs. Temperature

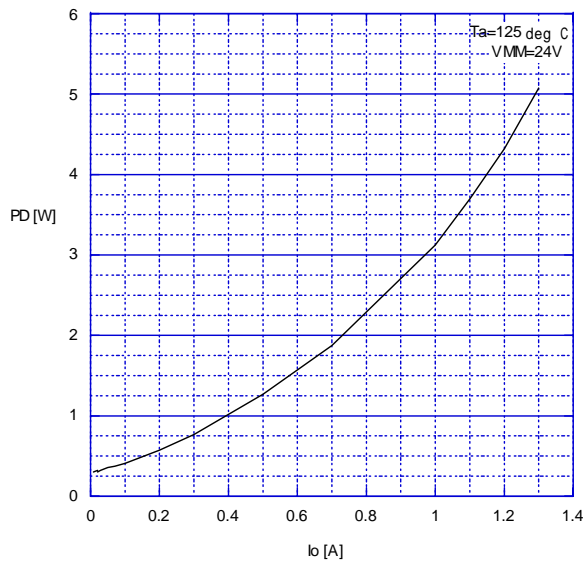


## TYPICAL CHARACTERISTICS 3

TSD\_Leak vs. Temperature



PD vs. Io



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