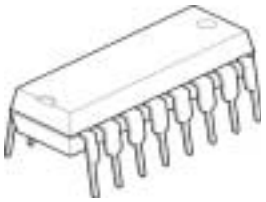
H BRIDGE DRIVER

■ GENERAL DESCRIPTION

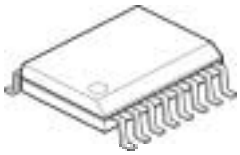
The NJM2675 is a general-purpose 60V single H-bridge drive IC. It consists of a H-bridge, a thermal shut down circuit and its alarm output. The alarm output can detect application problems and the system reliability will be significantly improved if monitored by Microprocessor.

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

■ PACKAGE OUTLINE



NJM2675D

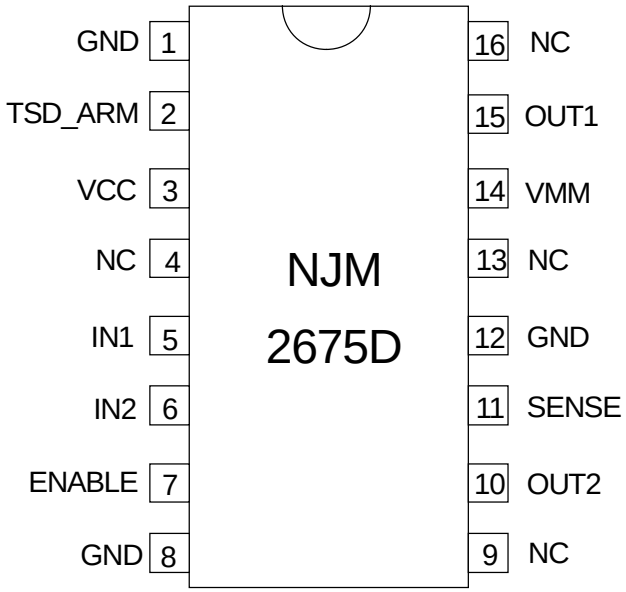


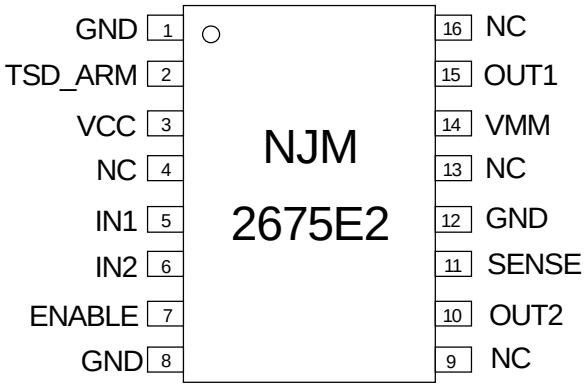
NJM2675E2

■ FEATURE

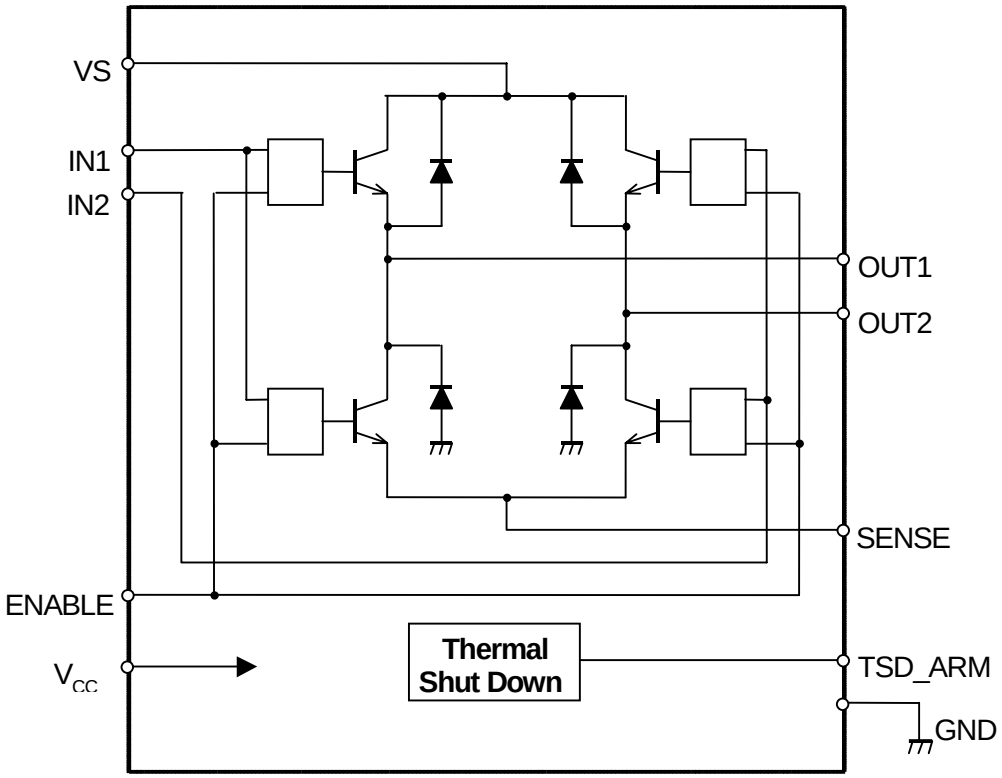
- Wide Voltage Range 4V to 55V
- Wide Range of Current Control 5 to 1200mA
- Thermal Shut Down Circuit (with Alarm Output)
- Dead Band Protector
- Package Outline DIP16 / EMP16

■ PIN CONNECTION





■ 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	Topr	-40 ~ 85	°C
Storage Temperature	Tstg	-55 ~ 150	°C

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

■ RECOMENNDO 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	Tj		-20	-	125	°C

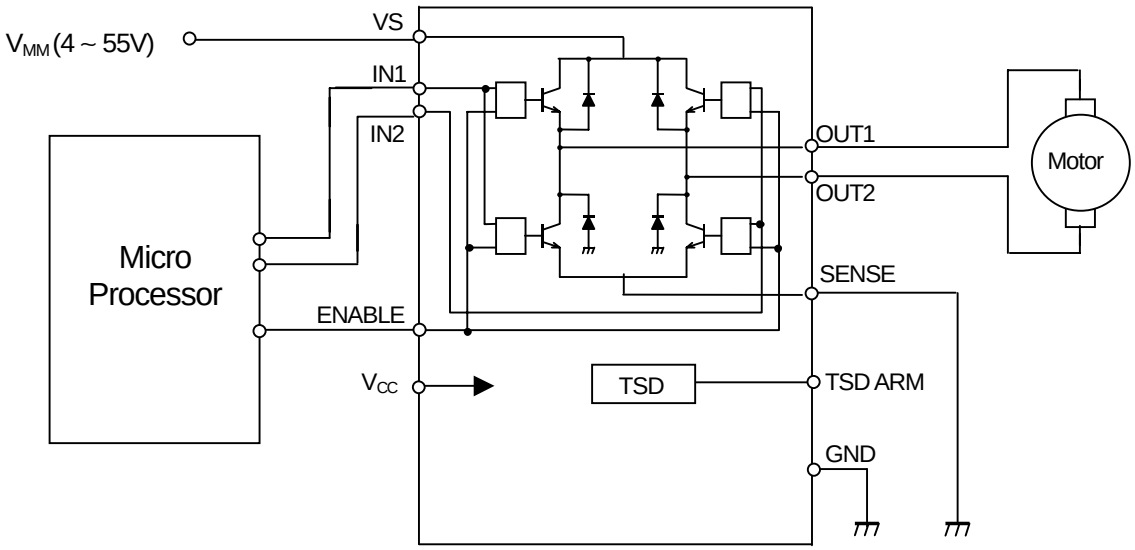
■ ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
GENERAL						
Quiescent current	Icc	Enable=H,IN1=L,IN2=H	-	20	-	mA
Thermal shutdown	Ttsd		-	170	-	°C
Off-State leak current	$Itsd_{-LEAK}$	TSD ARM=5V	-	-	50	µA
Thermal alarm output saturation	Vtsd	Io=5mA	-	0.5	0.7	V
Dead time protection	Td		-	1	-	µs
LOGIC						
Input LOW voltage	Vi_L		-	-	0.6	V
Input HIGH voltage	Vi_H		2	-	-	V
Input HIGH current	Ii_H	Vi=2.4V	-	-	20	µA
Input LOW current	Ii_L	Vi=0.4V	-0.4	-	-	mA
OUTPUT						
Upper transistor saturation	V_{OU1}	Io=1000mA	-	1.3	1.5	V
	V_{OU2}	Io=1300mA	-	1.5	1.8	V
Lower transistor saturation	V_{OL1}	Io=1000mA	-	0.5	0.8	V
	V_{OL2}	Io=1300mA	-	0.8	1.3	V
Upper diode forward	V_{fU1}	Io=1000mA	-	1.3	1.6	V
	V_{fU2}	Io=1300mA	-	1.6	1.9	V
Lower diode forward	V_{fL1}	Io=1000mA	-	1.3	1.6	V
	V_{fL2}	Io=1300mA	-	1.6	1.9	V
Output leakage current	Lo_{-LEAK}	V_{MM}=50V	-	-	1	mA
Upper diode recoverly time	Trr_U		-	250	-	ns
Lower diode recoverly time	Trr_L		-	250	-	ns

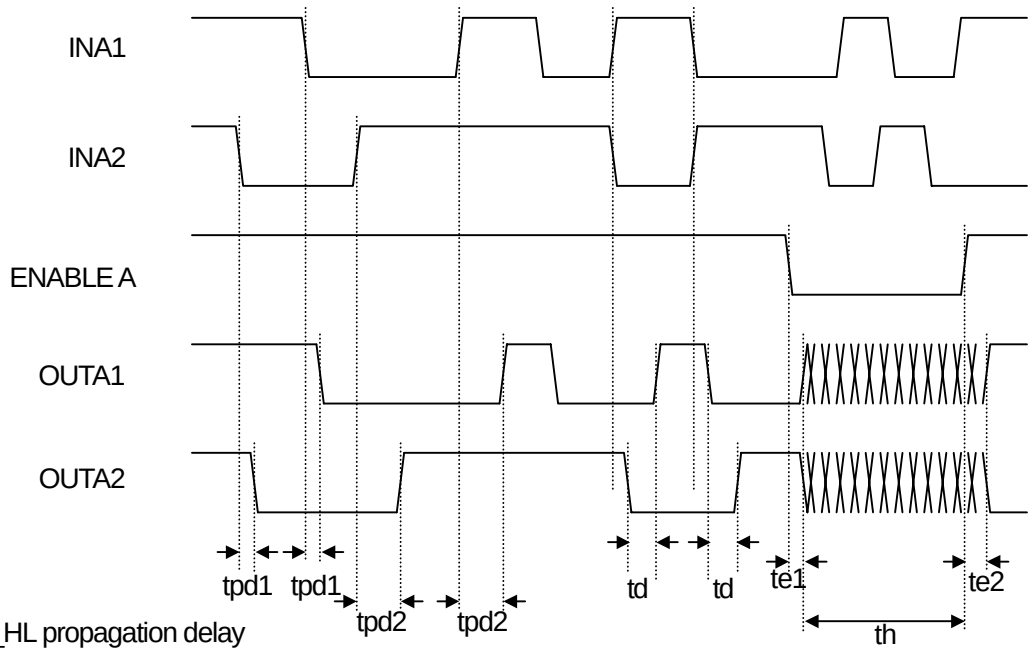
■ TRUTH TABLE

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

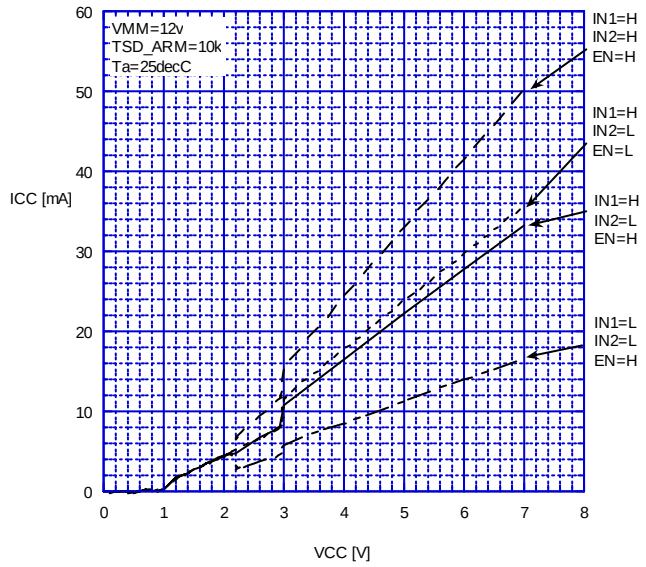


tpd1:IN_HL propagation delay
tpd2:IN_LH propagation delay
td :Output dead band protection delay
te1 :ENABLE_HL propagation delay
te2 :ENABLE_LH propagation delay
th :Output High impedance section

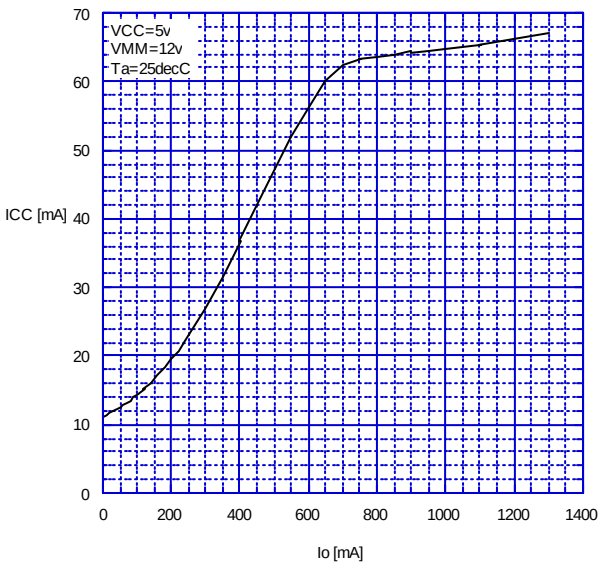
	Reference value	unit
tpd1	1.0	us
tpd2	2.5	us
td	1.5	us
te1	3.5	us
te2	2.0	us

■ TYPICAL CHARACTERISTICS 1

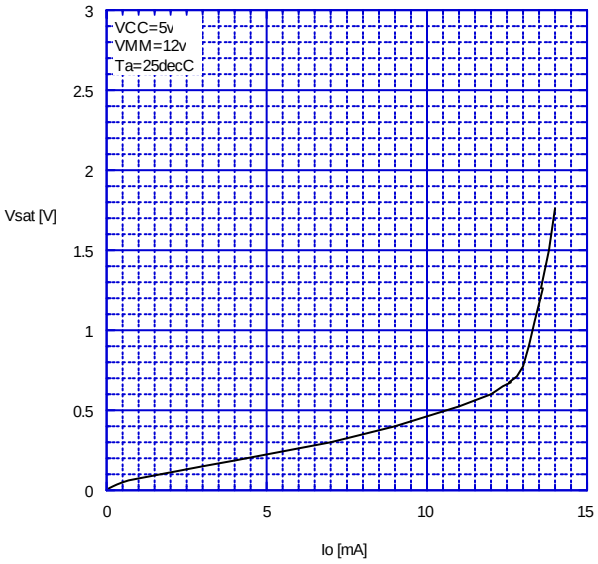
ICC vs. VCC



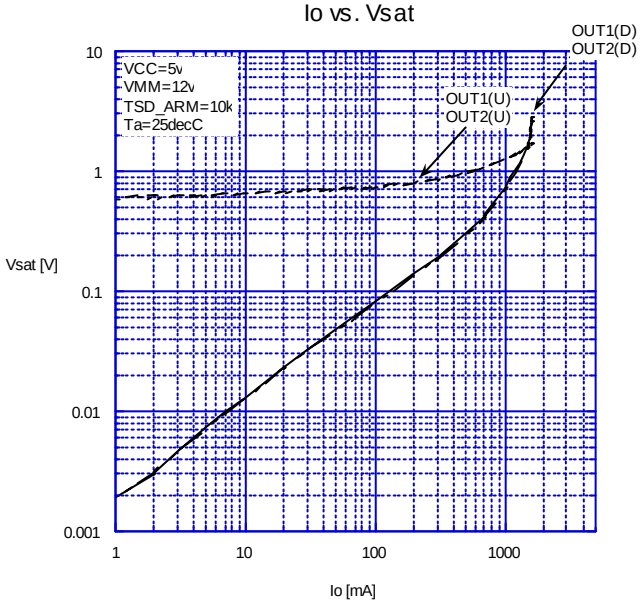
Io vs. ICC



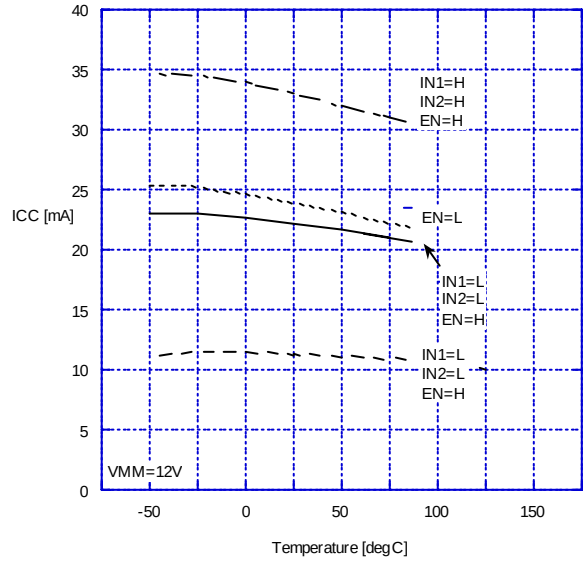
Io vs. Vsat-TSD_ARM



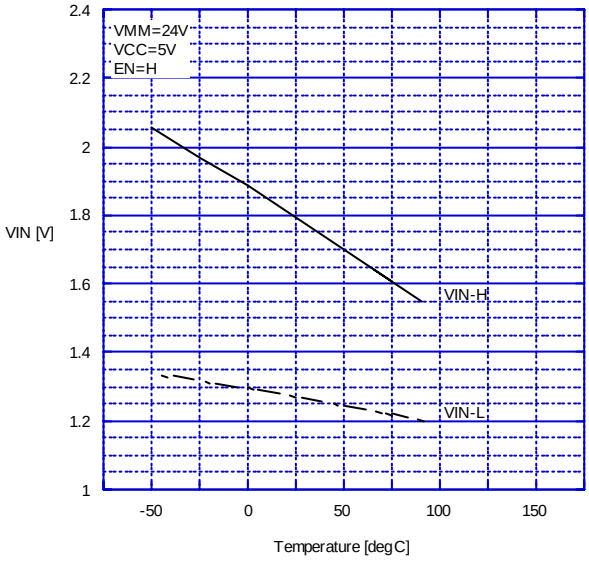
Io vs. Vsat



ICC vs. Temperature

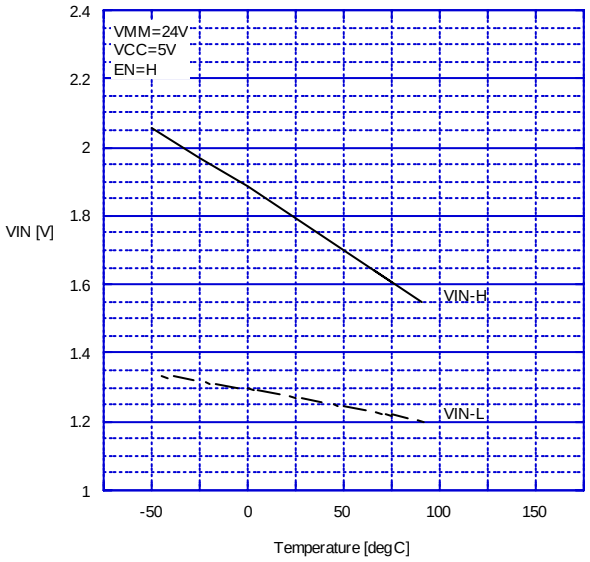


VIN vs. Temperature

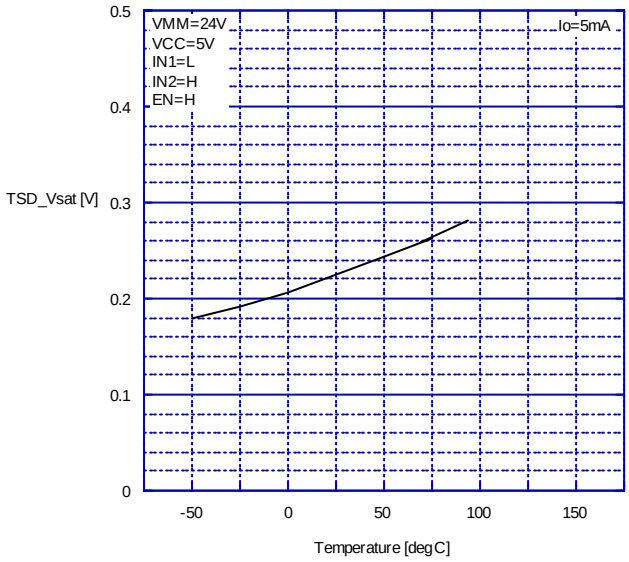


■ TYPICAL CHARACTERISTICS 2

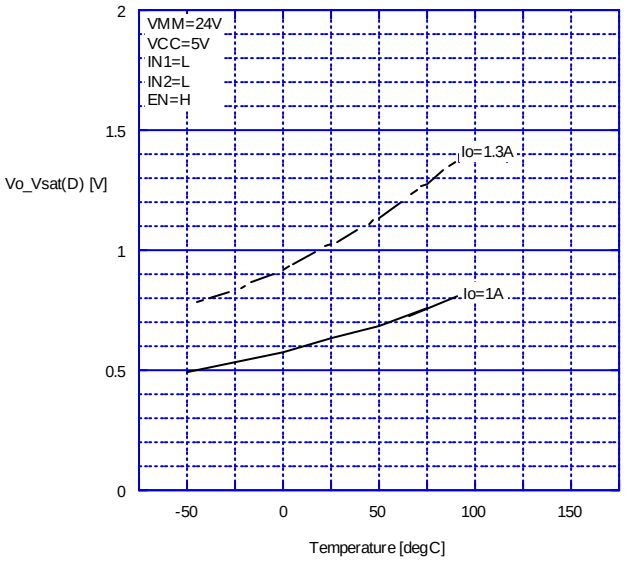
VIN vs. Temperature



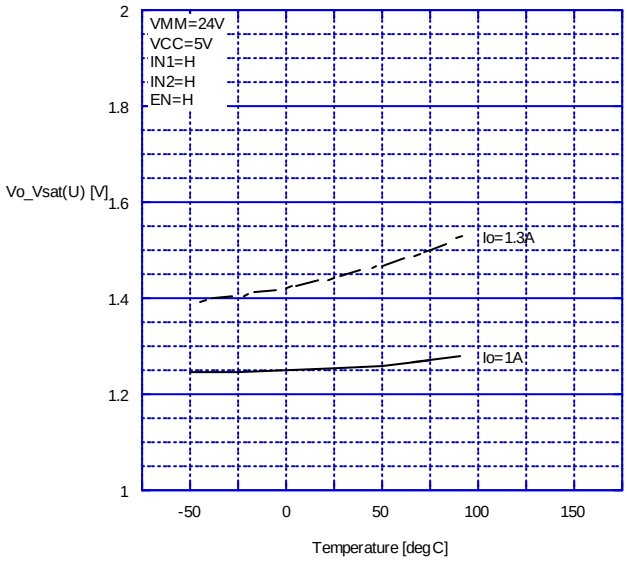
TSD_Vsat vs. Temperature



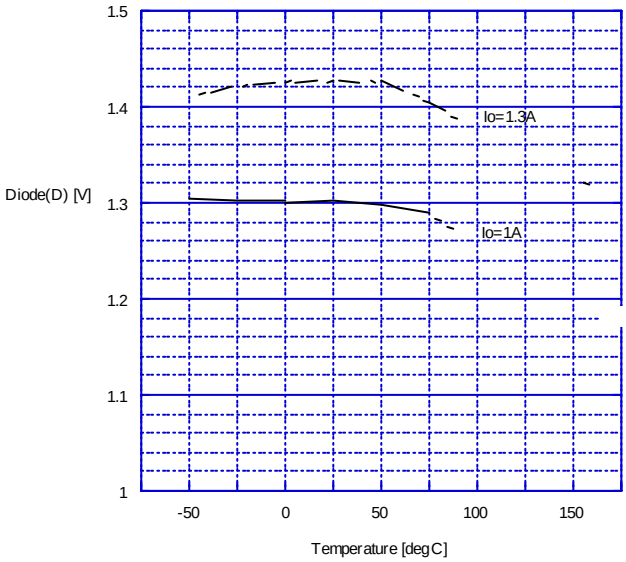
Vo_Vsat(D) vs. Temperature



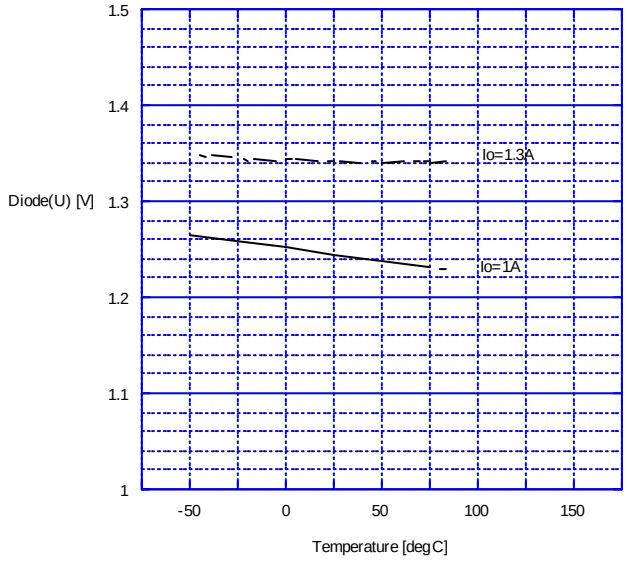
Vo_Vsat(U) vs. Temperature



Diode(D) vs. Temperature

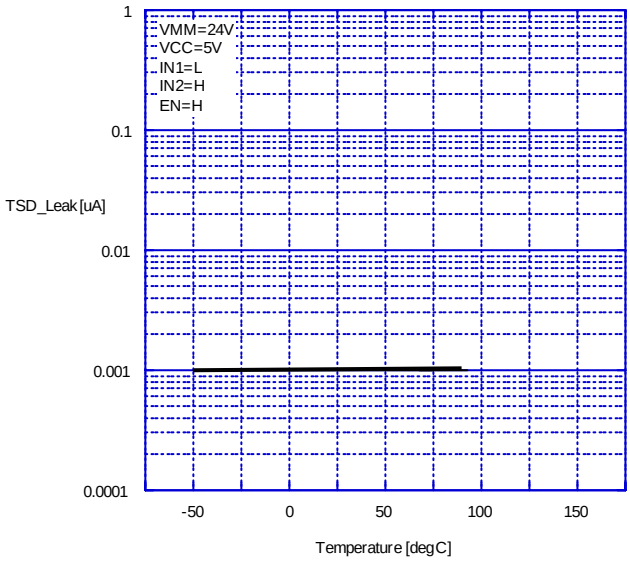


Diode(U) vs. Temperature

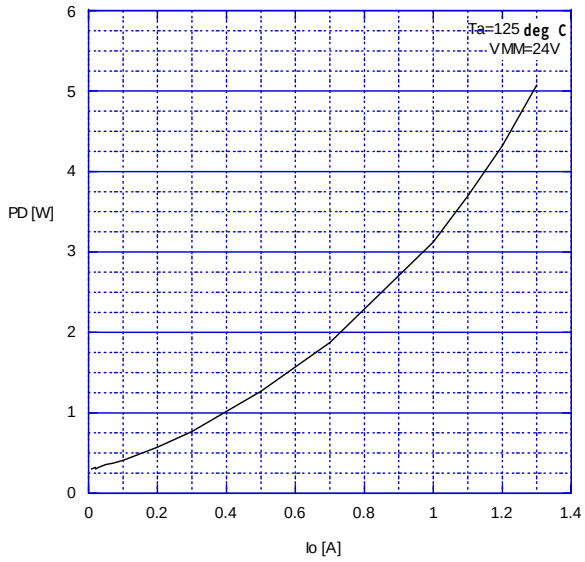


■ TYPICAL CHARACTERISTICS 3

TSD_Leak vs. Temperature



PD vs. Io



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