

N-Channel MOSFET

Features:

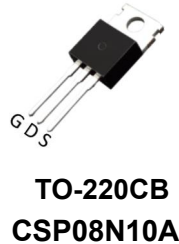
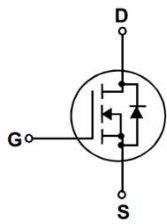
- RoHS Compliant
- Low RDS(on) & FOM
- Excellent stability and uniformity
- Extremely low switching loss
- Peak Current vs Pulse Width Curve

Applications:

- Adaptor
- Charger
- Lighting
- Power Supply

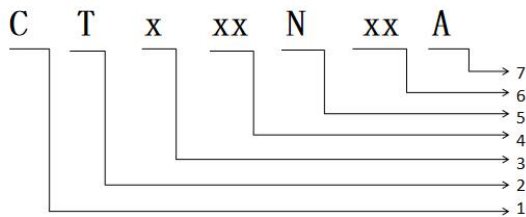
$V_{DSS}(\text{Min.})$	100V
$R_{DS(ON)}(\text{Typ.})$	7.6mΩ
I_D	70A

Schematic and Package Information:



Marking on the body:

MV/LV MOSFET tube naming rules



- 1: CYS for short
- 2: T: Trench S: SGT
- 3: Package
F: TO-220F P: TO-220 D: TO-252
U: TO-251 W: TO-247S/3P E: SOP-8
G: DFN5*6 K: DFN3.3*3.3
- 4: RDS(on) Typ
- 5: N: N channel P: P channel
- 6: Maximum breakdown voltage (10% of BVdss)
- 7: Series no.

Absolute Maximum Ratings $T_C=25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	CSx08N10A			Units
		TO-220F	TO-220CB	PDFN5*6	
Drain-to-Source Voltage	V _{DSS}	100			V
Continuous Drain Current	I _D	70			A
Pulsed Drain Current, V _{GS} @10V	I _{DM}	52			A
Power Dissipation	P _D	39	96		W
Derating Factor above 25℃		1.3	2		W/℃
Gate-to-Source Voltage	V _{GS}	±20			V
Single Pulse Avalanche Energy(L=10mH)	E _{AS}	25			mJ
Peak Diode Recovery dv/dt	dv/dt	5			V/ns
Maximum Temperature for Soldering	T _L	300			℃
Operating Junction and Storage Temperature Range (NOTE *2)	T _J and T _{STG}	150, -55 to150			

Thermal Resistance

Parameter	Symbol	Typ.			Units
		TO-220F	TO-220CB	PDFN5*6	
Junction to Case	$R_{\theta JC}$	4.17	1.25		$^{\circ}\text{C}/\text{W}$
Junction to Ambient	$R_{\theta JA}$	62.5	62		$^{\circ}\text{C}/\text{W}$

Electrical Characteristics $T_J=25^{\circ}\text{C}$ unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Units	Test Conditions
Drain-to-Source Breakdown Voltage	BV_{DSS}	100	--	--	V	$V_{GS}=0\text{V}, I_D=250\mu\text{A}$
Gate Threshold Voltage	$V_{GS(TH)}$	1	1.7	3	V	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	--	7.6	8.0	m Ω	$V_{GS}=10\text{V}, I_D=1\text{A}$
Drain-to-Source Leakage Current	I_{DSS}	--	--	1	uA	$V_{DS}=80\text{V}, V_{GS}=0\text{V}$ $T_J=25^{\circ}\text{C}$
		--	--	100		$V_{DS}=80\text{V}, V_{GS}=0\text{V}$ $T_J=125^{\circ}\text{C}$
Gate-to-Source Forward Leakage	I_{GSS}	--	--	+100	nA	$V_{GS}=+20\text{V}$
Gate-to-Source Reverse Leakage		--	--	-100		$V_{GS}=-20\text{V}$

Dynamic Characteristics Essentially independent of operating temperature

Parameter	Symbol	Min.	Typ.	Max.	Units	Test Conditions
Input Capacitance	C_{iss}	--	1300	--	pF	$V_{GS}=0\text{V}, V_{DS}=30\text{V}$ $f=1.0\text{MHz}$
Output Capacitance	C_{oss}	--	100	--		
Reverse Transfer Capacitance	C_{rss}	--	56	--		
Total Gate Charge	Q_g	--	34	--	nC	$I_D=10\text{A}, V_{DS}=50\text{V}$ $V_{GS}=10\text{V}$
Gate-to-Source Charge	Q_{gs}	--	6	--		
Gate-to-Drain ("Miller") Charge	Q_{gd}	--	9	--		
Turn-on Delay Time	$t_{d(ON)}$	--	7	--	ns	$V_{DS}=50\text{V}, I_D=10\text{A},$ $V_G=10\text{V} R_G=5\Omega$
Rise Time	t_{rise}	--	7	--		
Turn-Off Delay Time	$t_{d(OFF)}$	--	29	--		
Fall Time	T_{fall}	--	7	--		

Source-Drain Diode Characteristics $T_C=25^{\circ}\text{C}$ unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Units	Test Conditions
Continuous Drain-Source Diode Forward Current	I_S	--	--	82	A	$T_C=25^{\circ}\text{C}$
Pulsed Drain-Source Diode Forward Current	I_{SM}	--	--	300		
Diode Forward Voltage	V_{SD}	--	--	1.3	V	$I_{SD}=10\text{A}, V_{GS}=0\text{V}$
Reverse Recovery Time	t_{rr}	--	32	--	ns	$I_F=I_S$ $di/dt=100\text{A}/\mu\text{s}$
Reverse Recovery Charge	Q_{rr}	--	200	--	nC	

Notes:

- $T_J = +25^{\circ}\text{C}$ to $+150^{\circ}\text{C}$.
- Repetitive rating; pulse width limited by maximum junction temperature.
- Pulse width $< 300\mu\text{s}$; duty cycle $< 2\%$.

Typical Characteristics

Figure 1. Typical Output Characteristics

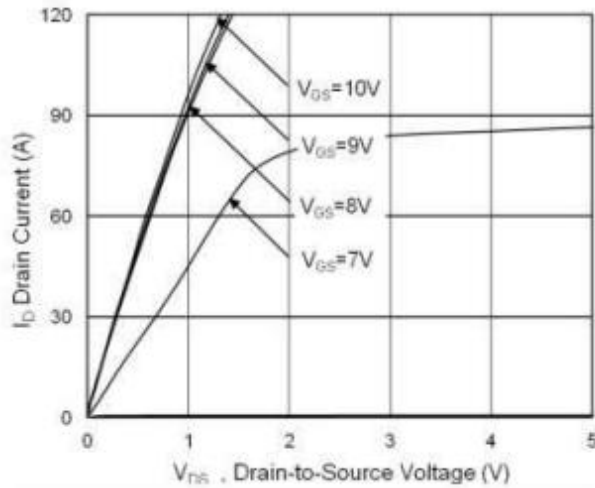


Figure 2. On-Resistance vs. G-S Voltage

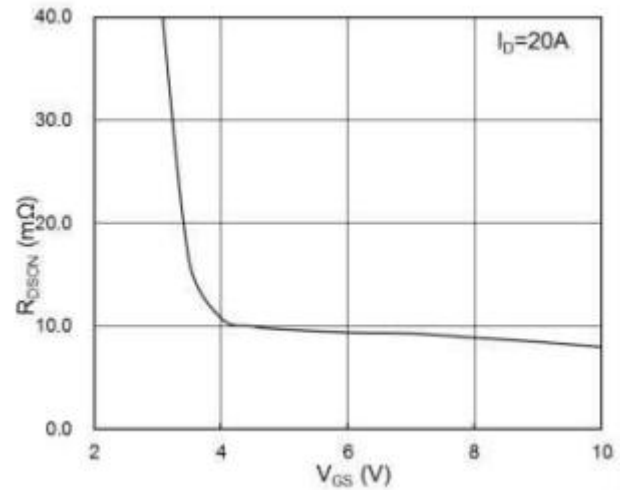


Figure 3. Forward Characteristics of Reverse Diode

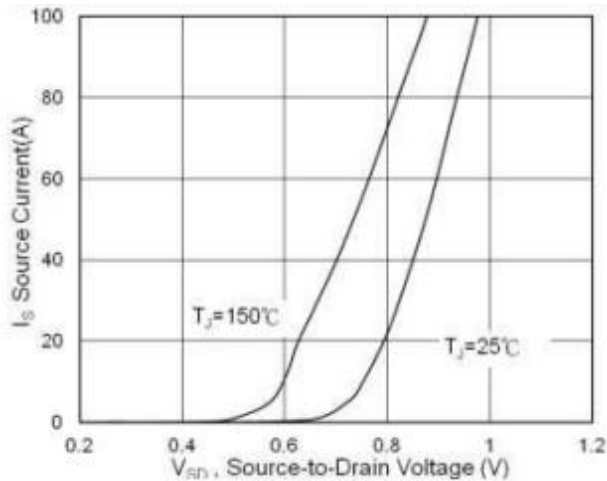


Figure 4. Gate-Charge Charge

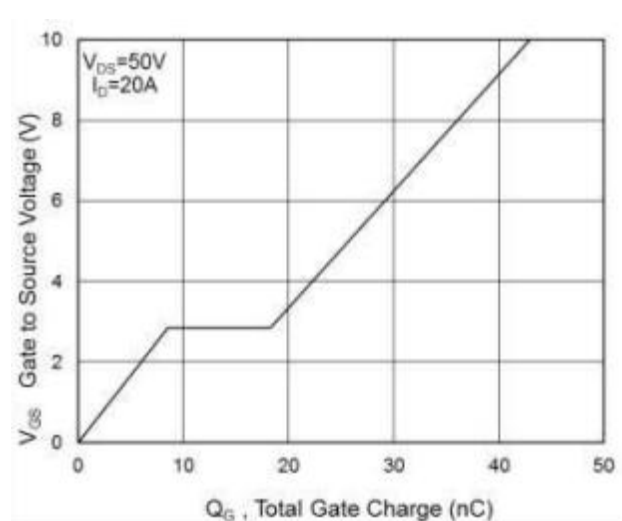


Figure 5. Normalized VGS(th) vs. TJ

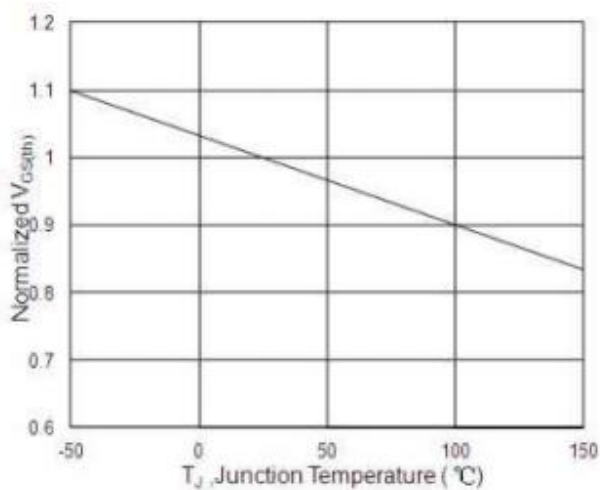


Figure 6. Normalized RDS(on) vs. TJ

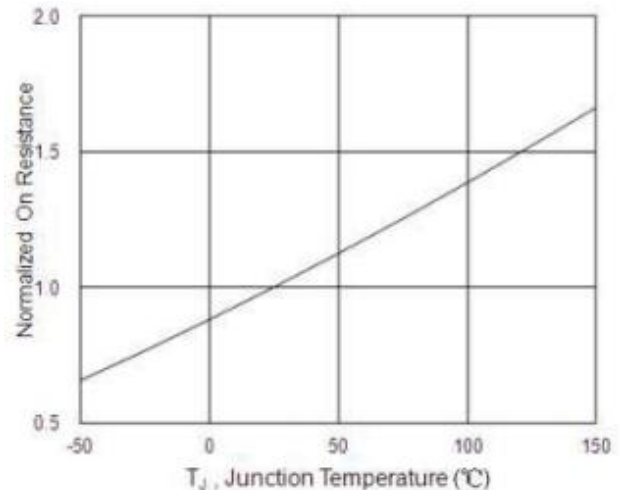


Figure 7. Capacitance

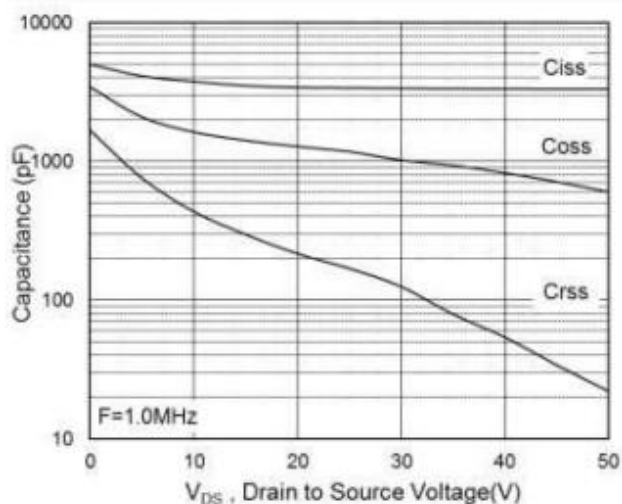


Figure 8. Safe Operating Area

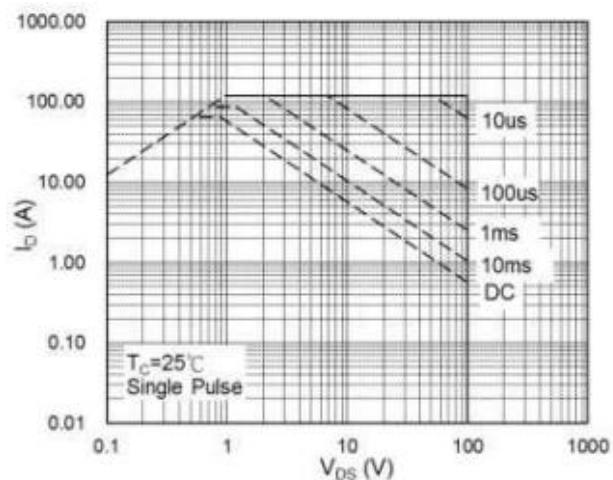
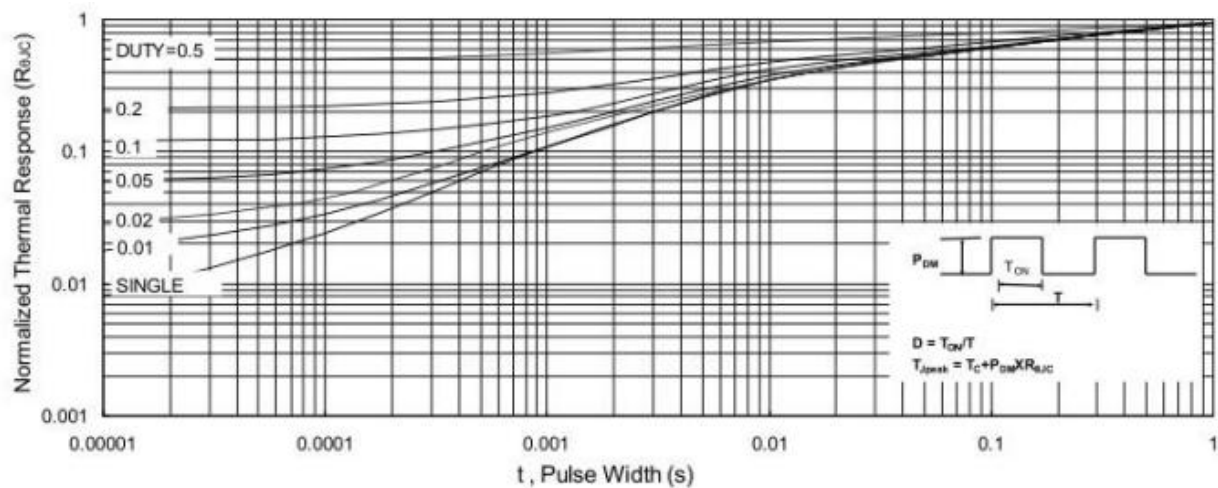
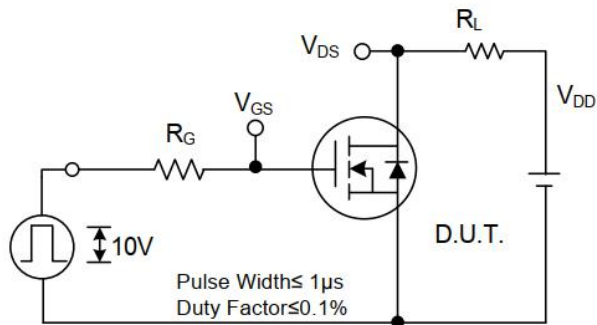


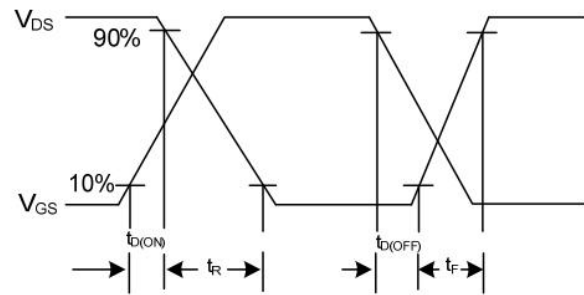
Figure 9. Normalized Maximum Transient Thermal Impedance



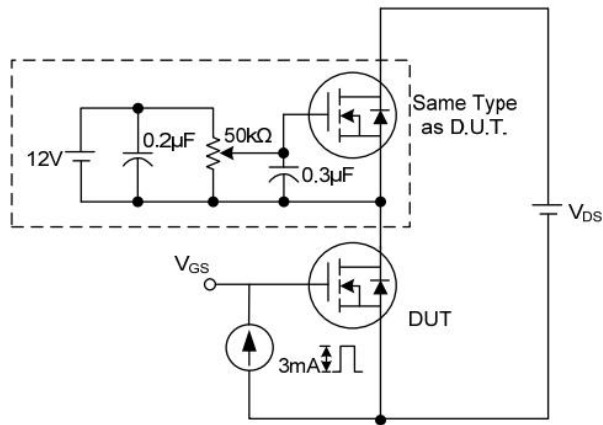
Test Circuits and Waveform



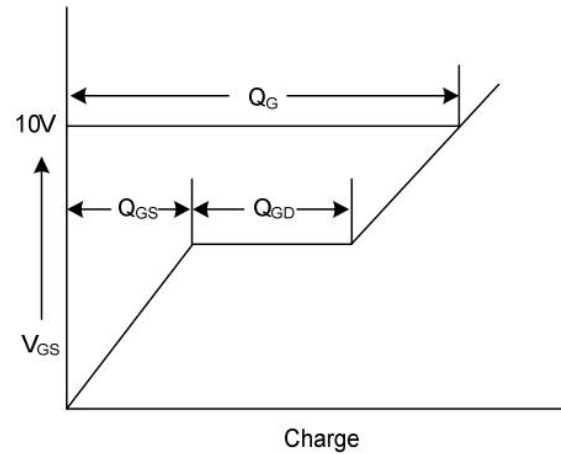
Switching Test Circuit



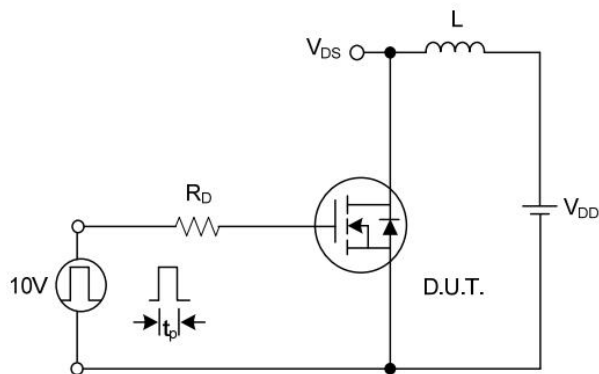
Switching Waveforms



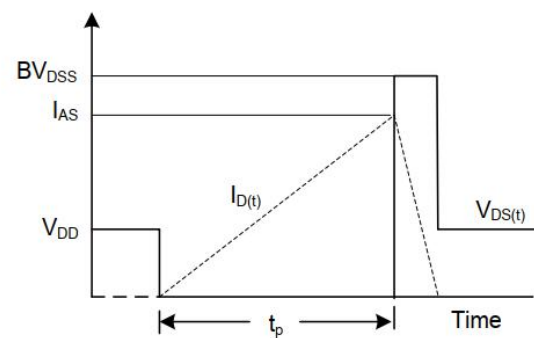
Gate Charge Test Circuit



Gate Charge Waveform



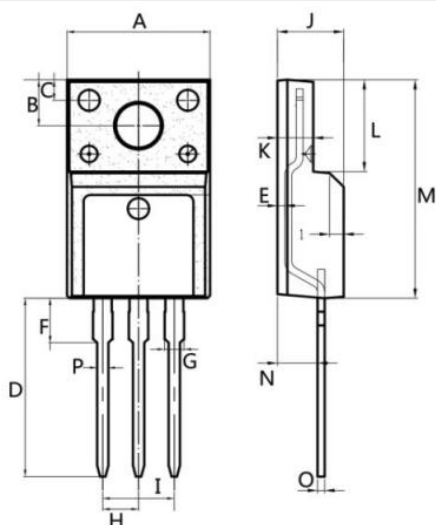
Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

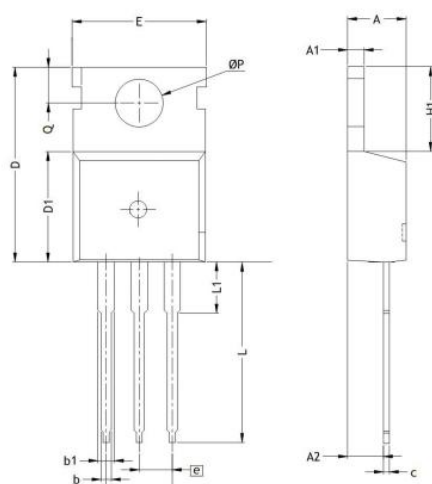
PACKAGE MECHANICAL DATA (Unit: mm):

TO-220F



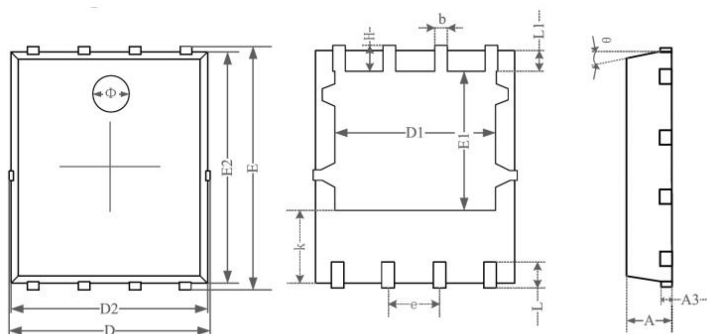
DIM	Min.	Max.
A	9.9	10.3
B	2.9	3.5
C	1.15	1.45
D	12.75	13.45
E	0.55	0.75
F	3.1	3.5
G	1.25	1.45
H	Typ 2.54	
I	Typ 5.08	
J	4.55	4.75
K	2.4	2.7
L	6.35	6.75
M	15.0	16.0
N	2.75	3.15
O	0.45	0.60
P	0.7	0.9
All Dimensions in millimeter		

TO-220CB



DIM	Min.	Max.
A	4.25	4.65
A1	1.25	1.35
A2	2.35	2.55
b	0.7	0.9
b1	1.15	1.75
c	0.45	0.6
D	14.35	15.95
D1	8.8	9.5
E	9.9	10.3
e	Typ 2.54	
e1	Typ 5.08	
H1	6.3	6.5
L	12.85	13.5
L1	2.85	3.25
Q	2.7	2.9
φP	3.5	3.9
All Dimensions in millimeter		

DFN5*6



DIM	Min.	Max.
A	0.8	1.0
A3	Typ 0.15	
D	4.9	5.1
E	6.0	6.1
D1	3.9	4.1
E1	3.3	3.5
D2	4.8	5.0
E2	5.7	5.8
K	1.2	1.4
b	0.3	0.4
e	Typ 1.27	
L	0.5	0.7
L1	0.4	0.6
H	0.5	0.7
θ	10°	12°
φ	1.1	1.3
All Dimensions in millimeter		

Statement:

- ◆ We reserve the right to change the manual without prior notice! Customers should obtain the latest version of the information before placing an order, and verify that the relevant information is complete and up-to-date.
- ◆ Any semiconductor product has the possibility of failure or failure under specific conditions. The buyer has the responsibility to comply with safety standards and take safety measures when using Silan product for system design and complete machine manufacturing, so as to avoid the occurrence of personal injury or property loss caused by potential failure risk!
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