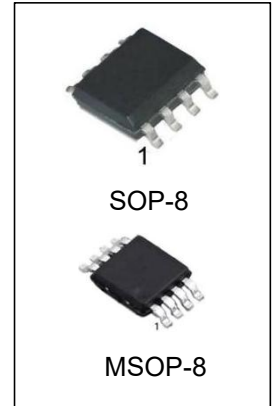


P-Channel Enhancement Mode MOSFET

FEATURES

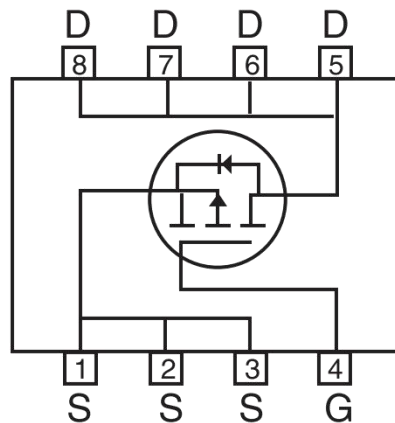
- 30V,-5.3A,
 $R_{DS(ON)}=50m\Omega$ @ $V_{GS}=-10V$.
 $R_{DS(ON)}=90m\Omega$ @ $V_{GS}=-4.5V$.
- Super high dense cell design for extreyly low $R_{DS(ON)}$.
- High power and current handling capability.
- Surface Mount Package.



ORDERING INFORMATION

DEVICE	Package Type	MARKING	Packing	Packing Qty
HG9435M/TR	SOP-8	HG9435	REEL	2500pcs/reel
HG9435MM/TR	MSOP-8	HG9435	REEL	3000pcs/reel

PIN CONFIGURATION



ABSOLUTE MAXIMUM RATINGS ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous ^a @ $T_J=125^{\circ}\text{C}$ -Pulsed ^b	I_D	± 5.3	A
	I_{DM}	± 20	A
Drain-Source Diode Forward Current ^a	I_S	-1.9	A
Maximum Power Dissipation ^a	P_D	2.5	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^{\circ}\text{C}$
Lead Temperature (Soldering, 10 seconds)	TL	260	$^{\circ}\text{C}$

Note: Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. Operating Ratings indicate conditions for which the device is intended to be functional, but specific performance is not ensured.

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient ^a	$R_{\theta JA}$	50	$^{\circ}\text{C/W}$
--	-----------------	----	----------------------

ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

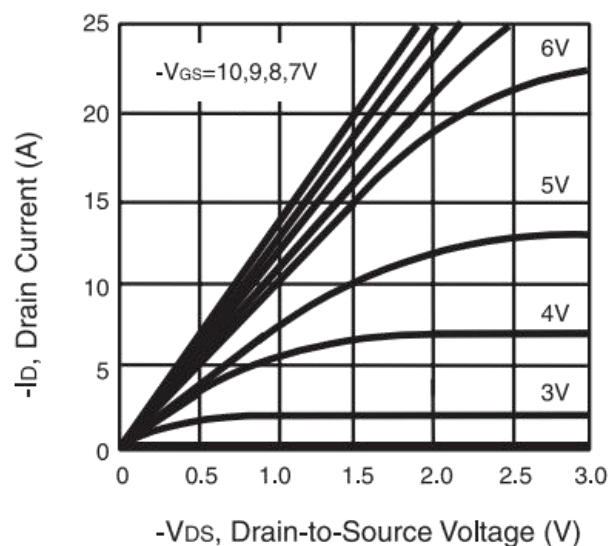
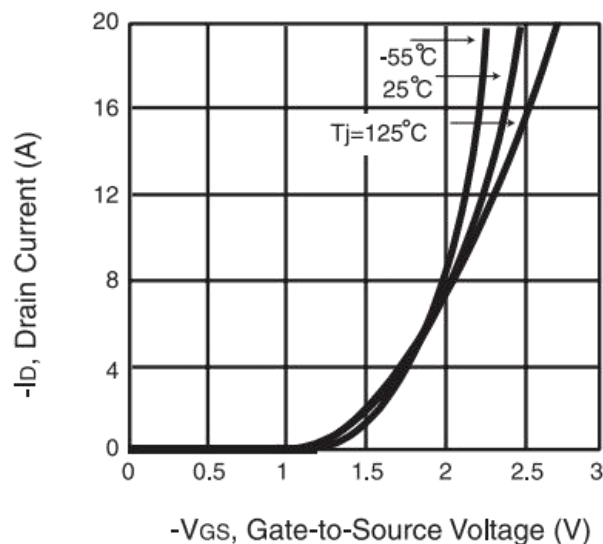
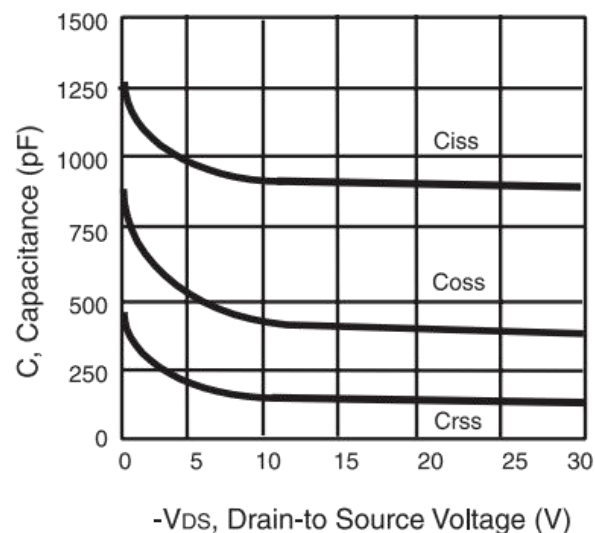
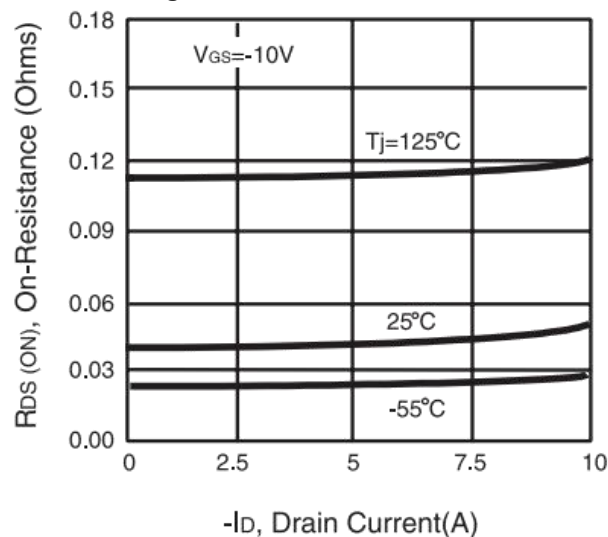
Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BVD _{SS}	V _{GS} =0V,I _D =-250μA	-30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-24V,V _{GS} =0V			-1	μA
Gate-Body Leakage	I _{GSS}	V _{GS} =±20V,V _{DS} =0V			±100	nA
ON CHARACTERISTICS ^b						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} ,I _D =-250μA	-1		-3	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =-10V,I _D =-5.3A		40	50	mΩ
		V _{GS} =-4.5V,I _D =-4.2A		67	90	mΩ
On-State Drain Current	I _{D(ON)}	V _{DS} =-5V,V _{GS} =-10V	-20			A
Forward Transconductance	g _{FS}	V _{DS} =-15V,I _D =-5.3A	4	8.3		s
DYNAMIC CHARACTERISTICS ^c						
Input Capacitance	C _{ISS}	V _{DS} =-15V,V _{GS} =0V F=1.0MHz		860	1120	pF
Output Capacitance	C _{ISS}			458	600	pF
Reverse Transfer Capacitance	C _{ISS}			140	190	pF
SWITCHINGCHARACTERISTICS ^c						
Turn-OnDelay Time	t _{D(ON)}	=-15V, I _D =-1A, V _{GEN} =-10V, R _{GEN} =6Ω		9	30	ns
Rise Time	t _r			16	60	ns
Turn-Off Delay Time	t _{D(OFF)}			75	120	ns
Fall Time	t _f			40	100	ns
Total Gate Charge	Q _g	V _{DS} =-15V.I _D =-5.3A, V _{GS} =-10V		29	40	nC
Gate-Source Charge	Q _{gs}			3		nC
Gate-Drain Charge	Q _{gd}			9		nC

ELECTROCAL CHARACTERISTICS($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
DRAIN-SOURCE DIODE CHARAC TERISCS ^b						
Diode Forward Voltage	VSD	VGS=0V,IS=-5.3A		-0.84	-1.3	V

Notes:

- Surface Mounted on FR4 Board, $t \leq 10\text{sec}$.
- Pulse Test:Pulse Width $\leq 300\mu\text{s}$.Duty Cycle $\leq 2\%$.
- Guaranteed by design,not subject to production testing.


Figure1.Output Characteristics

Figure2.Transfer Characteristics

Figure3. Capacitance

Figure4.On-Resistance Variation with Drain Current and Temperature

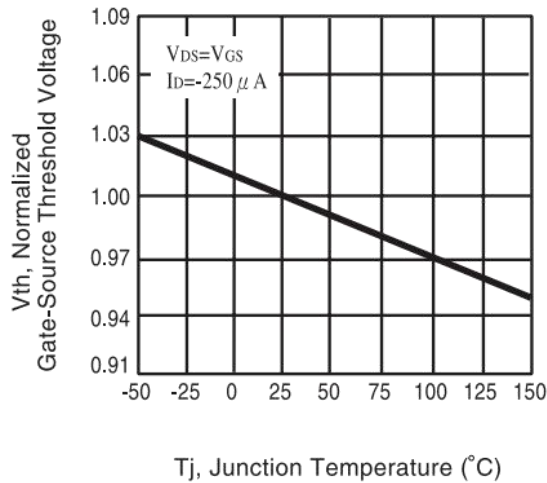


Figure 5. Gate Threshold Variation with Temperature

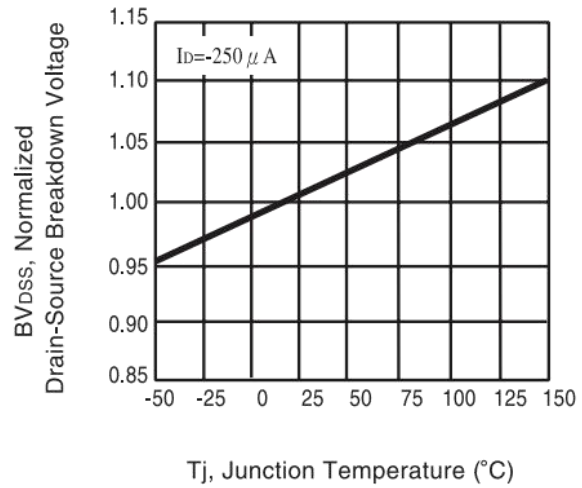


Figure 6. Breakdown Voltage Variation with Temperature

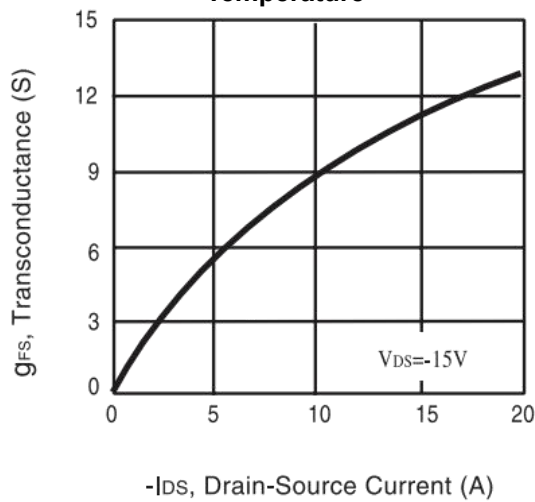


Figure 7. Transconductance Variation with Drain Current

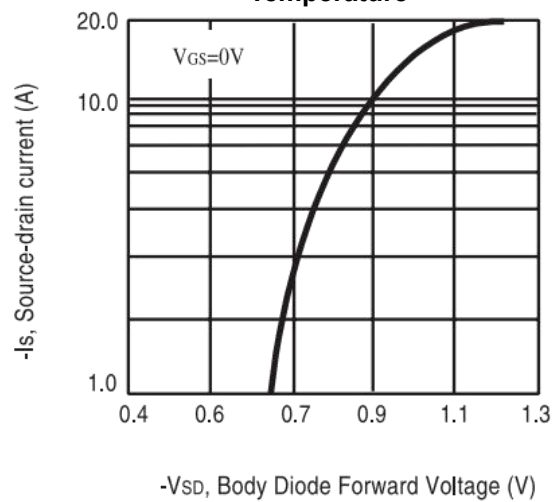


Figure 8. Body Diode Forward Voltage Variation with Source Current

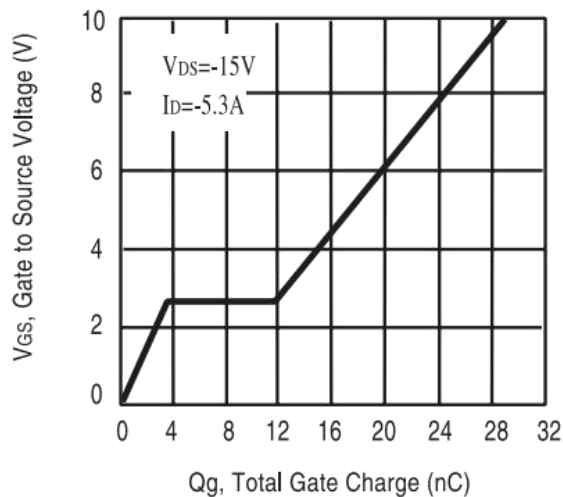


Figure 9. Gate Charge

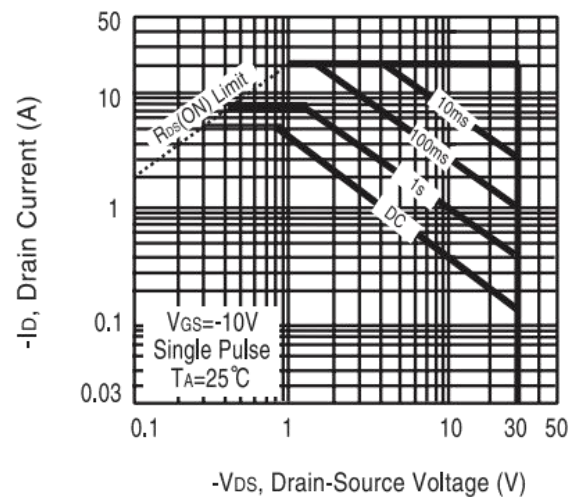


Figure 10. Maximum Safe Operating Area

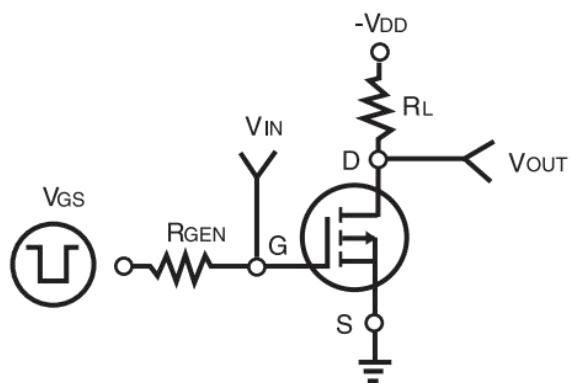


Figure11.Switching Test Circuit

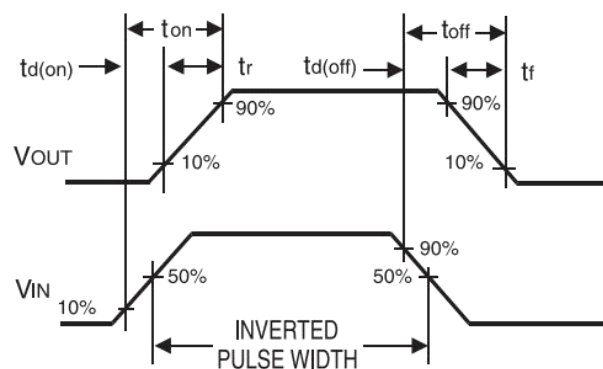


Figure12.Switching Waveforms

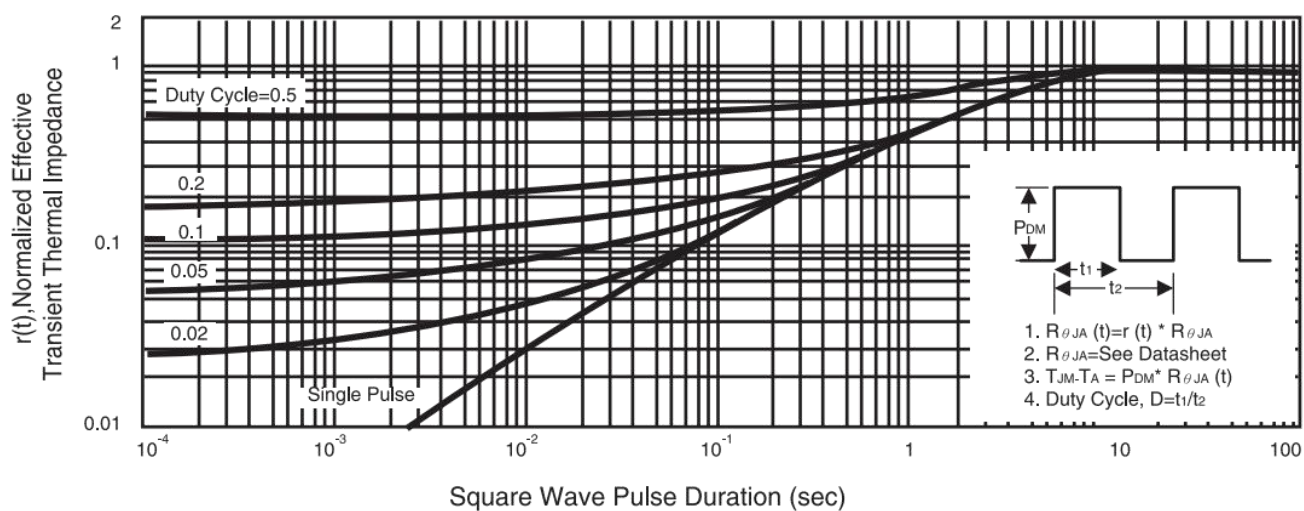
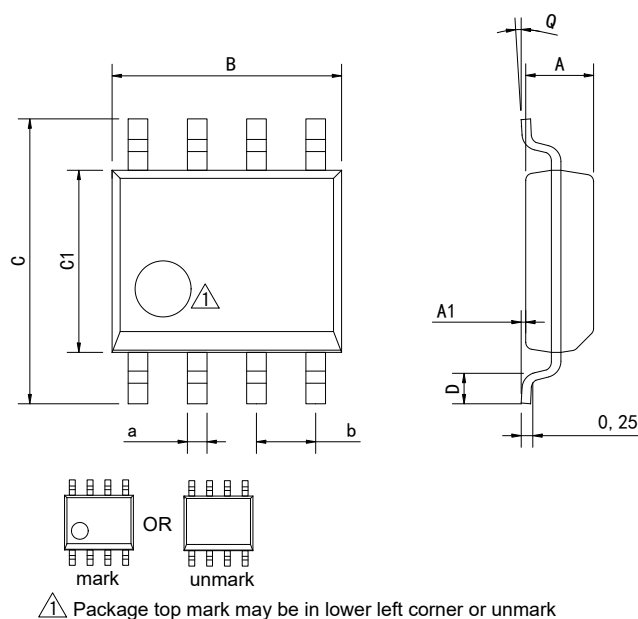


Figure13.Normalized Thermal Transient Impedance Curve

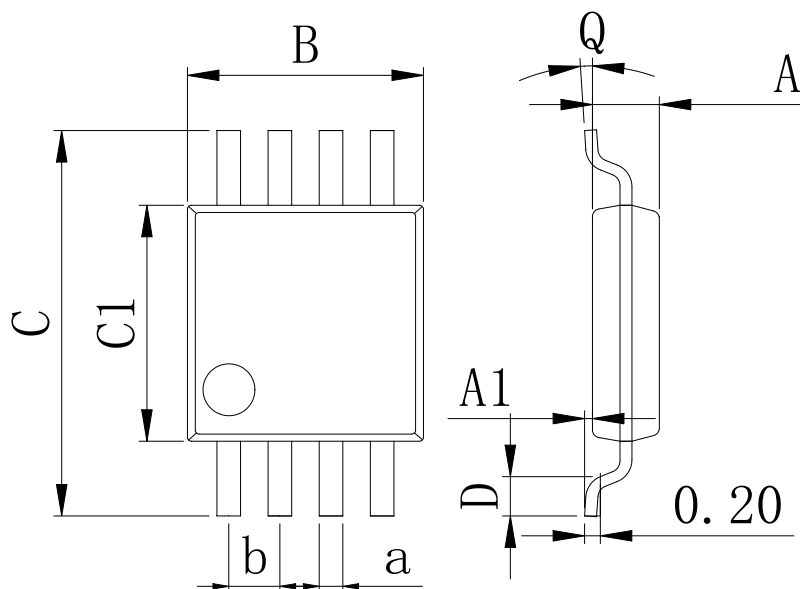
Physical Dimensions

SOP-8



Dimensions In Millimeters(SOP-8)									
Symbol:	A	A1	B	C	C1	D	Q	a	b
Min:	1.35	0.05	4.90	5.80	3.80	0.40	0°	0.35	1.27 BSC
Max:	1.55	0.20	5.10	6.20	4.00	0.80	8°	0.45	

MSOP-8



Dimensions In Millimeters(MSOP-8)									
Symbol:	A	A1	B	C	C1	D	Q	a	b
Min:	0.80	0.05	2.90	4.75	2.90	0.35	0°	0.25	0.65 BSC
Max:	0.90	0.20	3.10	5.05	3.10	0.75	8°	0.35	

Revision History

REVISION NUMBER	DATE	REVISION	PAGE
V1.0	2016-3	New	1-8
V1.1	2019-9	Update encapsulation type、Add annotation for Maximum Ratings.	1、 2
V1.2	2024-11	Update Lead Temperature	2
V1.3	2025-12	Update important statements、 Update SOP-8 Dimension drawing	6、 8

IMPORTANT STATEMENT:

Huaguan Semiconductor reserves the right to change products and services offered without prior notice. Customers should obtain the latest relevant information before placing orders and verify that such information is current and complete. Huaguan Semiconductor assumes no responsibility or liability for altered documents.

Customers are responsible for complying with safety standards and implementing safety measures when using Huaguan Semiconductor products in system design and end-product manufacturing. You assume full responsibility for: selecting the appropriate Huaguan Semiconductor products for your application; designing, validating, and testing your application; and ensuring that your application complies with applicable standards and all other safety, security, or other requirements. This is to prevent potential risks that may lead to personal injury or property damage.

Huaguan Semiconductor products are not approved for use in life support, military, aerospace, or other high-risk applications. Huaguan products are neither intended nor warranted for use in such systems or equipment. Any failure or malfunction may lead to personal injury or severe property damage. Such applications are deemed "Unsafe Use." Unsafe Use includes, but is not limited to: surgical and medical equipment, nuclear energy control equipment, aircraft or spacecraft instruments, control or operation of vehicle power, braking, or safety systems, traffic signal instruments, all types of safety devices, and any other applications intended to support or sustain life. Huaguan Semiconductor shall not be liable for consequences resulting from Unsafe Use in these fields. Users must independently evaluate and assume all risks. Any issues, liabilities, or losses arising from the use of products beyond their approved applications shall be solely borne by the user. Users may not claim any compensation from Huaguan Semiconductor based on these terms. If any third party claims against Huaguan Semiconductor due to such Unsafe Use, the user shall compensate Huaguan Semiconductor for all resulting damages and liabilities.

Huaguan Semiconductor provides technical and reliability data (including datasheets), design resources (including reference designs), application or other design advice, web tools, safety information, and other resources for its semiconductor products. However, no guarantee is made that these resources are free from defects, and no express or implied warranties are provided. The use of testing and other quality control techniques is limited to Huaguan Semiconductor's quality assurance scope. Not all parameters of each device are tested.

Huaguan Semiconductor's documentation authorizes you to use these resources only for developing applications related to the products described herein. You are not granted rights to any other intellectual property of Huaguan Semiconductor or any third party. Any other reproduction or display of these resources is strictly prohibited. You shall fully indemnify Huaguan Semiconductor and its agents against any claims, damages, costs, losses, and liabilities arising from your use of these resources. Huaguan Semiconductor shall not be held responsible.