VFTT020R340NA

Datasheet

General Description

$V_{(BR)DSS}$	$R_{DS(ON)\_max}$	I_D
200V	34mΩ@10V	36A
	57mΩ@4.5V	

Symbol

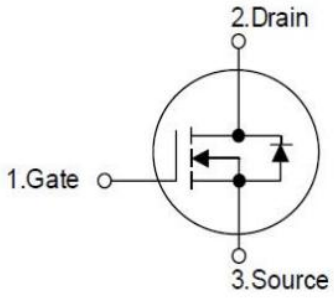


Figure 1 Symbol of VFTT020R340NA

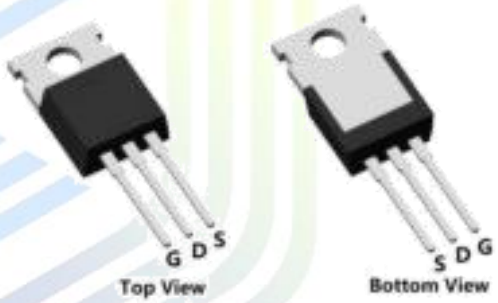
Features

- High Speed Power Switching
- Low Gate Charge
- Enhanced Avalanche Ruggedness
- Enhanced Body diode dv/dt capability

Application

- Switched mode power supply
- Solar inverter
- UPS and energy inverter
- Power Tools
- Motor Control

Package Type



TO-220

Figure 2 Package Type of VFTT020R340NA

Ordering Information

Product Name	Package
VFTT020R340NA	TO-220

Absolute Maximum Ratings (T_J= 25 ºC, unless otherwise specified)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	200	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current[Note 1] T_C=25ºC	I_D	36	A
Pulsed Drain Current[Note 2]	I_{DM}	110	A
Max Power Dissipation [Note 3] T_C=25ºC	P_D	89.4	W
Avalanche Current, Single Pulse [Note 4]	I_{AS}	40	A
Avalanche Energy, Single Pulse [Note 4]	E_{AS}	183	mJ
Operation Junction temperature	T_J	-55 to 150	ºC

Thermal Resistance

Parameter	Symbol	Min	Typ	Max	Unit
Thermal Resistance, Junction-to-Ambient[Note 5]	$R_{\theta JA}$		60		ºC/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$		1.4		

Notes:

1) Calculated continuous current based on maximum allowable junction temperature $T_{J(MAX)}$ =150°C.

2) Repetitive rating; pulse width limited by max. junction temperature.

3) P_D is based on max. junction temperature, using junction-case thermal resistance.

4) EAS test condition: V_{DS}=25V,V_{GS}=10V,L=0.4mH, Rg=25Ω, starting T_J=25 °C.

5)Device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with TA =25°C.

6)Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.

Electrical Characteristics(T_J= 25 ºC, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Statistic Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250uA	200			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=160V, V_{GS}=0V			1	uA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V			±100	nA
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250uA	2	3.2	4	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=8A		26.7	34	mΩ
		V_{GS}=4.5V, I_D=2A		45.3	57	mΩ
Dynamic Characteristics						
Input Capacitance	C_{ISS}	V_{GS}=0V, V_{DS}=100V, f=1MHz		1792		pF
Output Capacitance	C_{OSS}			139		pF
Reverse Transfer Capacitance	C_{RSS}			7.6		pF
Gate Resistance	R_G	f=1MHz, Open Drain		2.6		Ω
Total Gate Charge (@V_{GS}=10V)	Q_g	V_{GS}=0-10V, V_{DS}=100V, I_D=10A		22.1		nC
Total Gate Charge (@V_{GS}=4.5V)	Q_g			10.3		
Gate to Source Charge	Q_{gs}			7.0		
Gate to Drain Charge	Q_{gd}			2.3		
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=100V, I_D=10A, V_{GS}=10V, R_G=10Ω		13.8		ns
Rise Time	t_r			24.7		
Turn-off Delay Time	$t_{d(off)}$			38.5		
Fall Time	t_f			20.5		
Reverse Diode Characteristics						
Drain-Source Diode Forward Voltage[Note 6]	V_{SD}	V_{GS}=0V, I_{SD}=1A		0.7	1.2	V
Body DiodeReverse Recovery Time	t_{rr}	V_R=100V, I_F=10A, di/dt=100A/us		91.4		ns
Body DiodeReverse Recovery Charge	Q_{rr}			333.8		nC
Continuous Source Current, T_C =25°C	I_S	--		36.8		A

Typical Performance Characteristics

Figure 3: Typ. Output Characteristics

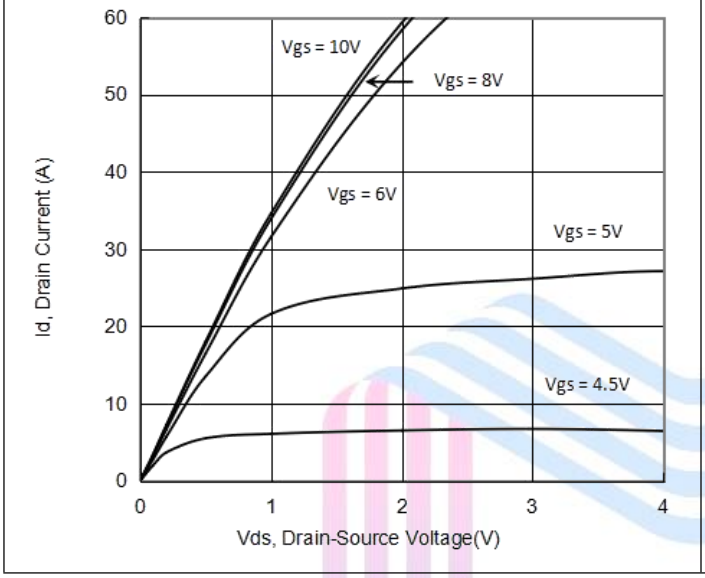


Figure 4: Typ. Transfer Characteristics

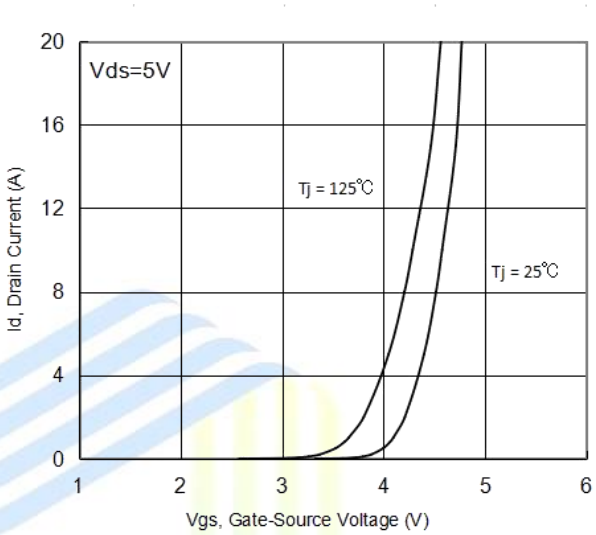


Figure 5: Forward Characteristics of Body Diode

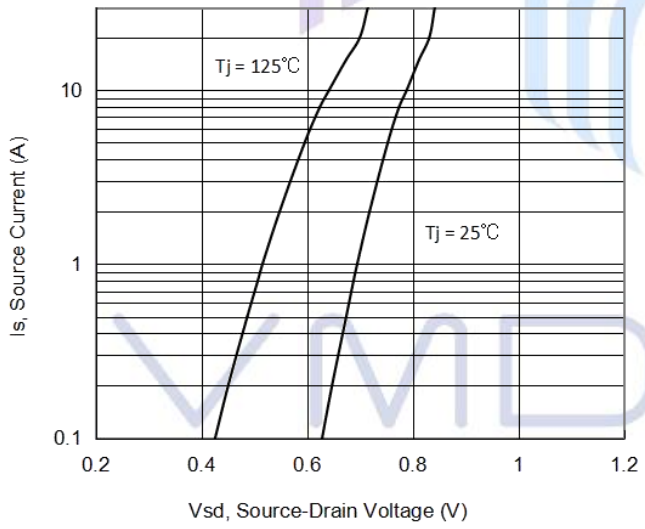


Figure 6: On-Resistance vs.Gate-source voltage

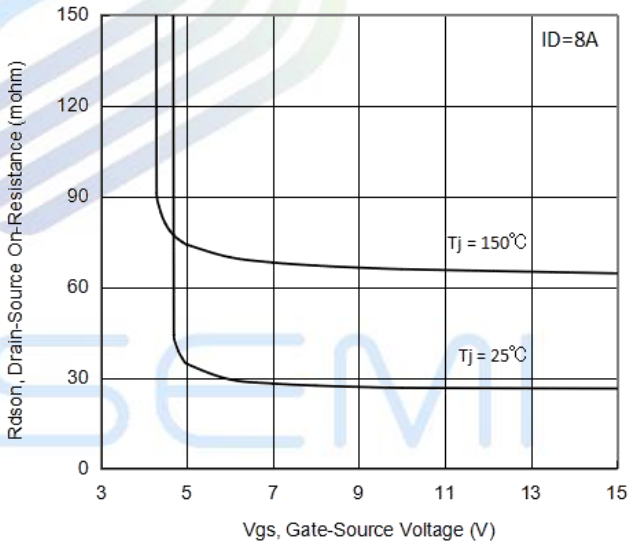


Figure 7: Drain-Source Current On-State Resistance

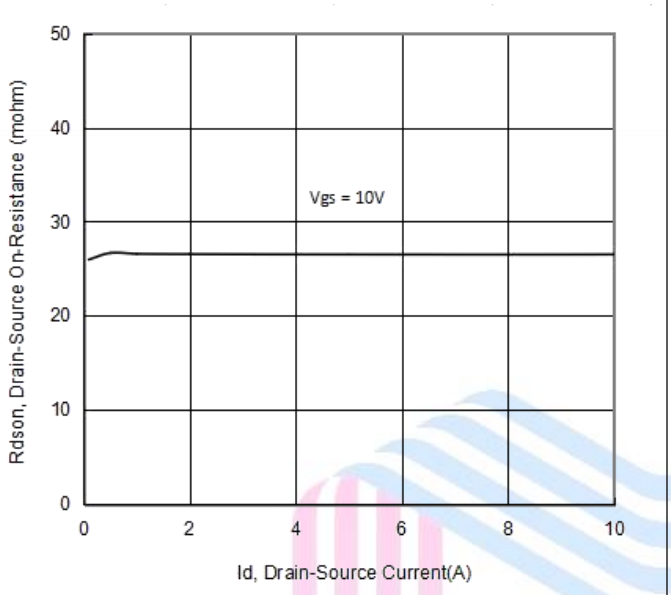


Figure 8: Normalized Rdson vs Temperature

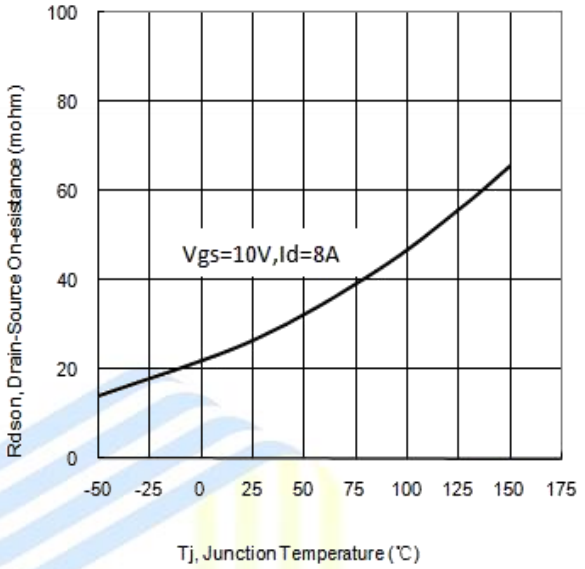


Figure 9: Typ. Capacitance

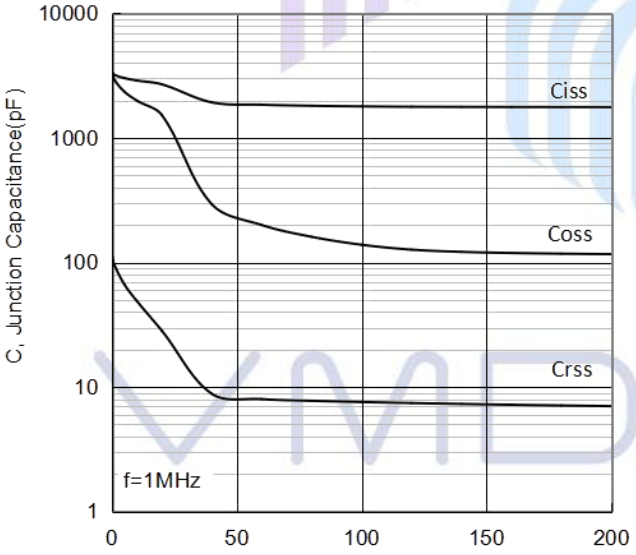


Figure: Typical Junction Capacitance

Figure 10: Gate Charge Characteristics

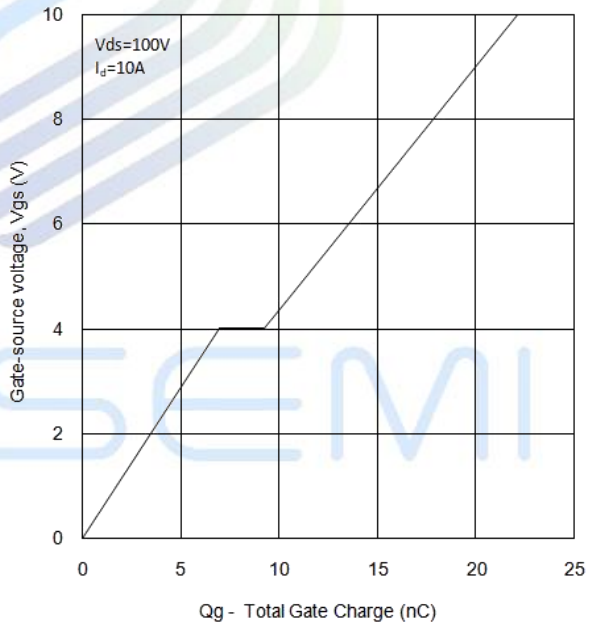


Figure11: Power Dissipation

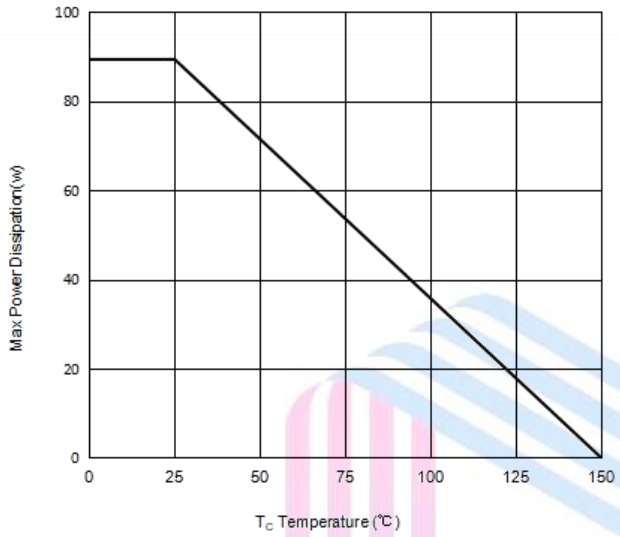


Figure12: Safe Operating Area

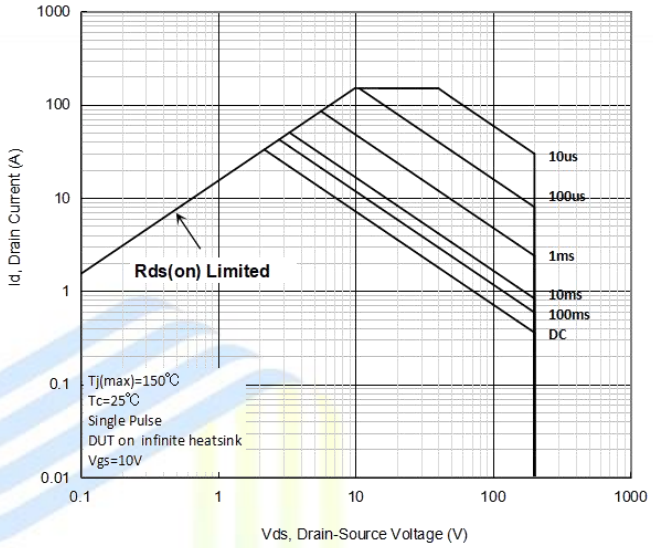


Figure 13: Single Pulse Maximum Power Dissipation

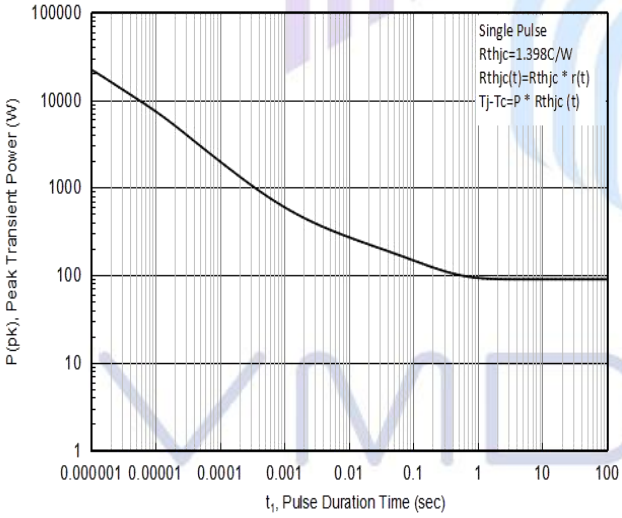
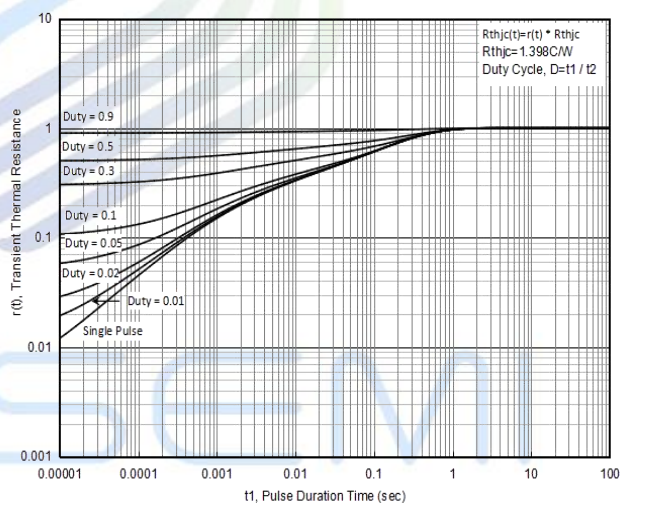
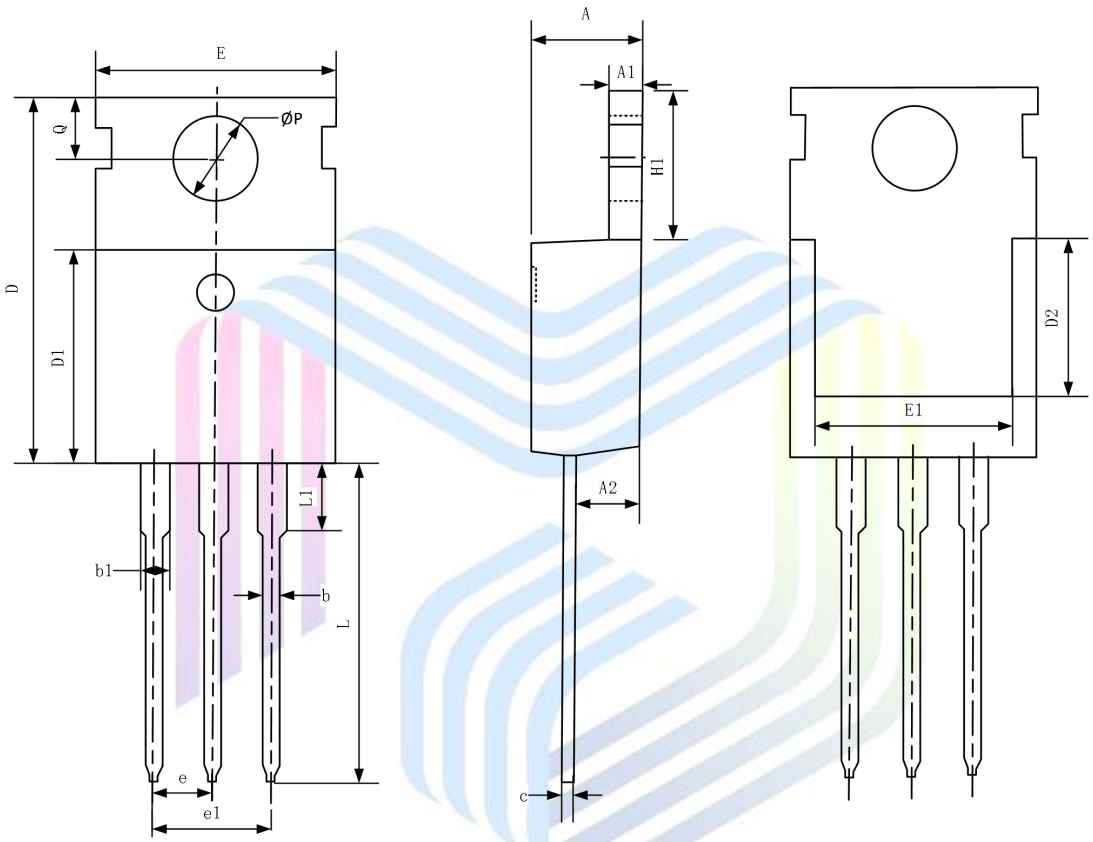


Figure 14: Transient Thermal Resistance



Mechanical Dimensions

TO-220 Package Information



SYMBOL	MILLIMETER	
	MIN	MAX
A	4. 37	4. 70
Al	1. 25	1.40
A2	2. 20	2.60
b	0. 70	0.95
b1	1. 17	1.47
c	0.45	0. 60
D	15. 10	16. 10
D1	8. 80	9.40
D2	5. 50	-
E	9. 70	10. 30
E1	7.00	-
e	2. 54 BSC	
e1	5.08 BSC	
Hl	6.25	*6.* 85
L	12. 75	13. 80
L1	-	3.40
Ø P	3. 40	3.80
Q	2. 60	3.00

NOTICE

Hangzhou VMD Semiconductor Co., Ltd (VMD) reserves the right to make changes without notice in order to improve reliability, function or design and to discontinue any product or service without notice. Customers should obtain the latest relevant information before orders and should verify that such information is current and complete. All products are sold subject to VMD's terms and conditions supplied at the time of order acknowledgement.

VMD, its affiliates, agents, and employees, and all persons acting on its or their behalf, disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

VMD disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify VMD's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

VMD warrants performance of its hardware products to the specifications at the time of sale, testing, reliability and quality control are used to the extent VMD deems necessary to support this warrantee. Except where agreed upon by contractual agreement, testing of all parameters of each product is not necessarily performed.

VMD does not assume any liability arising from the use of any product or circuit designs described herein. Customers are responsible for their products and applications using VMD's components. To minimize risk, customers must provide adequate design and operating safeguards.

VMD does not warrant or convey any license to any intellectual property rights either expressed or implied under its patent rights, nor the rights of others. Reproduction of information in VMD's data sheets or data books is permissible only if reproduction is without modification or alteration. Reproduction of this information with any alteration is an unfair and deceptive business practice.

VMD is not responsible or liable for such altered documentation. Resale of VMD's products with statements different from or beyond the parameters stated by VMD for that product or service voids all express or implied warrantees for the associated VMD product or service and is an unfair and deceptive business practice.

Via-Media Semiconductor Limited Company

http://www.vmdsemi.com

Main Sites:

- **Headquarters**

Hangzhou Via-Media Semiconductor Co., LTD.
1305-1306, Building 71, No. 90, Wensan Road, Xihu District, Hangzhou, Zhejiang Province, P.R. China
Tel: +86-0571-8515 0563

- **Chengdu Office**

Chengdu Winhi Semiconductor Co., LTD.
Floor 15, Building 5, No. 171, Hele 2nd Street, Chengdu, Sichuan Province, P.R. China
Tel: +86-028-8505 0771

- **Shanghai**

Shanghai R&D Center.
1506~1508, Xinyin Building, 888 Yishan Road, Shanghai, P.R of China
Tel: +86-021-54201999

- **Shenzhen**

Shenzhen Sales Center.
17B, No.1 Phoenix Building, 2008 Shennan Road, Shenzhen, P.R of China
Tel: +86-0755-82570682

- **Xi'an**

Xi'an R&D Center
1703B, Building A, Greenland Center, Jinye Road, High-Tech Zone, Xi'an, Shaanxi, P.R of China