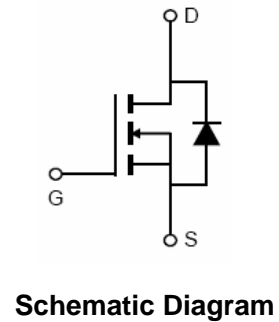
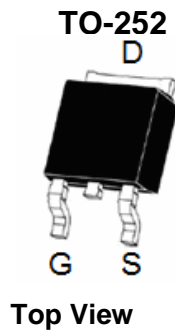


QIAOXIN N-Channel Super Trench II Power MOSFET

<p>Description</p> <p>The series of devices uses Super Trench II technology that is uniquely optimized to provide the most efficient high frequency switching performance. Both conduction and switching power losses are minimized due to an extremely low combination of $R_{DS(ON)}$ and Q_g. This device is ideal for high-frequency switching and synchronous rectification.</p> <p>Application</p> <ul style="list-style-type: none"> ● DC/DC Converter ● Ideal for high-frequency switching and synchronous rectification 	<p>General Features</p> <ul style="list-style-type: none"> ● $V_{DS} = 85V, I_D = 75A$ $R_{DS(ON)} = 8.2m\Omega$, typical @ $V_{GS} = 10V$ ● Excellent gate charge x $R_{DS(on)}$ product(FOM) ● Very low on-resistance $R_{DS(on)}$ ● 175 °C operating temperature ● Pb-free lead plating
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Package Marking and Ordering Information

Device Marking	Device	Device Package
VCRR080N85K		TO-252-2L

Absolute Maximum Ratings ($T_C = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	85	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	75	A
Drain Current-Continuous($T_C = 100^\circ C$)	$I_D(100^\circ C)$	55	A
Pulsed Drain Current	I_{DM}	300	A
Maximum Power Dissipation	P_D	90	W
Derating factor		0.6	W/ $^\circ C$
Single pulse avalanche energy ^(Note 4)	E_{AS}	352	mJ
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 175	$^\circ C$

Thermal Characteristic

Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.67	$^\circ C/W$
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Electrical Characteristics ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	85		-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=85V, V_{GS}=0V$	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	3.0	4.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=37.5A$	-	8.2	8.6	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=37.5A$		50	-	S
Dynamic Characteristics (Note 3)						
Input Capacitance	C_{iss}	$V_{DS}=40V, V_{GS}=0V,$ $F=1.0\text{MHz}$	-	2059	-	pF
Output Capacitance	C_{oss}		-	393	-	pF
Reverse Transfer Capacitance	C_{rss}		-	25.4	-	pF
Switching Characteristics (Note 3)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=40V, I_D=37.5A$ $V_{GS}=10V, R_G=1.6\Omega$	-	12	-	nS
Turn-on Rise Time	t_r		-	9	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	29	-	nS
Turn-Off Fall Time	t_f		-	7	-	nS
Total Gate Charge	Q_g	$V_{DS}=40V, I_D=37.5A,$ $V_{GS}=10V$	-	41.4	-	nC
Gate-Source Charge	Q_{gs}		-	14.9	-	nC
Gate-Drain Charge	Q_{gd}		-	12.5	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 2)	V_{SD}	$V_{GS}=0V, I_S=37.5A$	-	-	1.2	V
Diode Forward Current	I_S		-	-	75	A
Reverse Recovery Time	t_{rr}	$T_J = 25^{\circ}\text{C}, I_F = 37.5A$ $di/dt = 100A/\mu s$ (Note 3)	-	55	-	nS
Reverse Recovery Charge	Q_{rr}		-	98	-	nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
3. Guaranteed by design, not subject to production
4. EAS condition : $T_J=25^{\circ}\text{C}, V_{DD}=50V, V_G=10V, L=0.25\text{mH}, R_g=25\Omega$

Typical Electrical and Thermal Characteristics

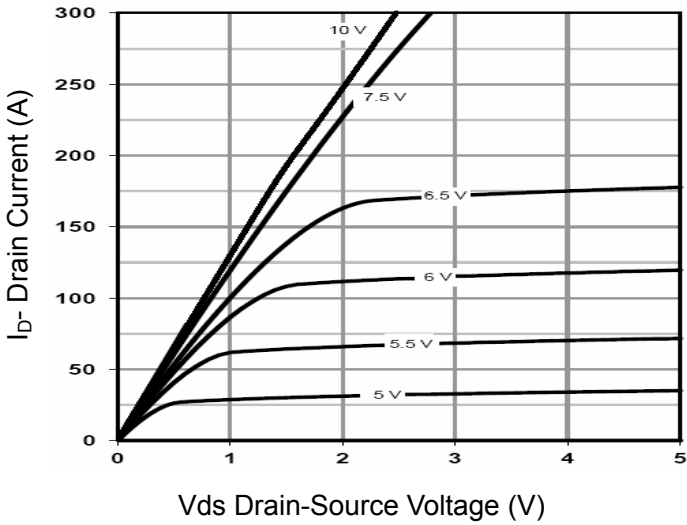


Figure 1 Output Characteristics

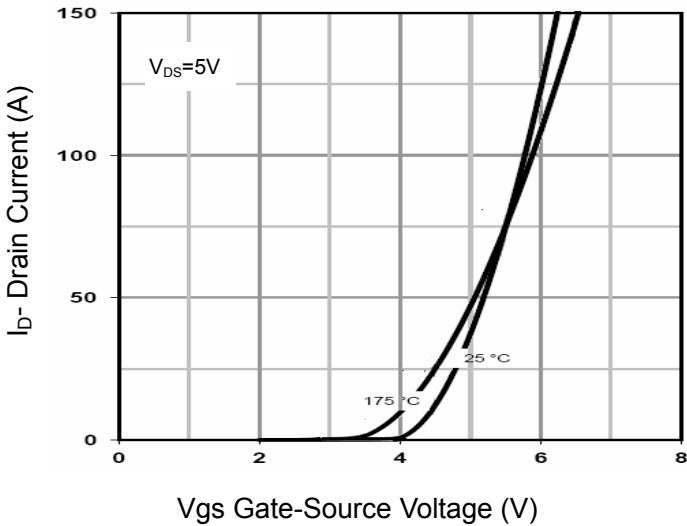


Figure 2 Transfer Characteristics

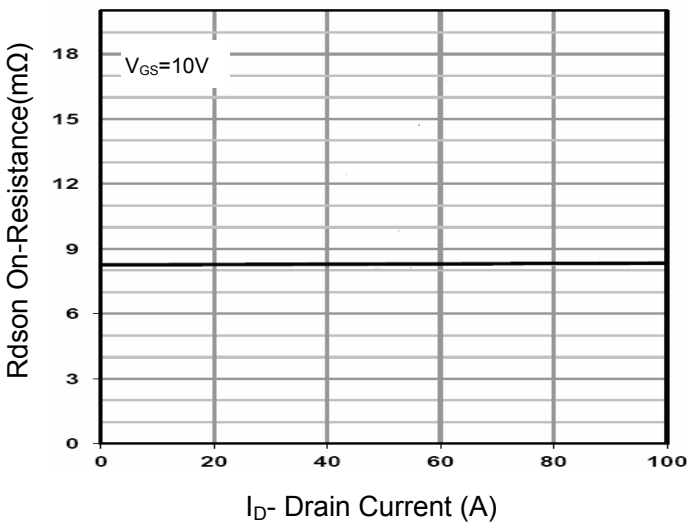


Figure 3 Rdson- Drain Current

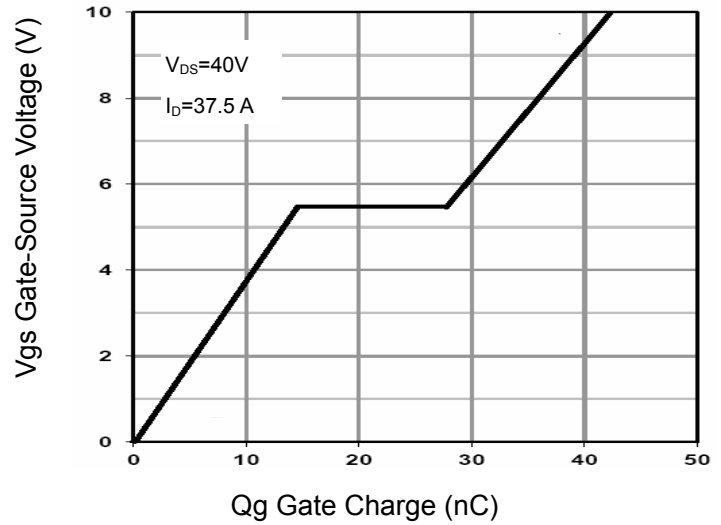


Figure 4 Gate Charge

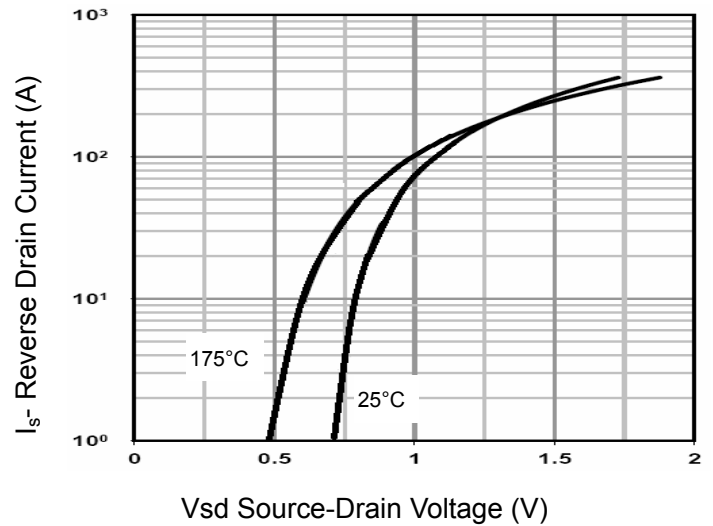


Figure 5 Source- Drain Diode Forward

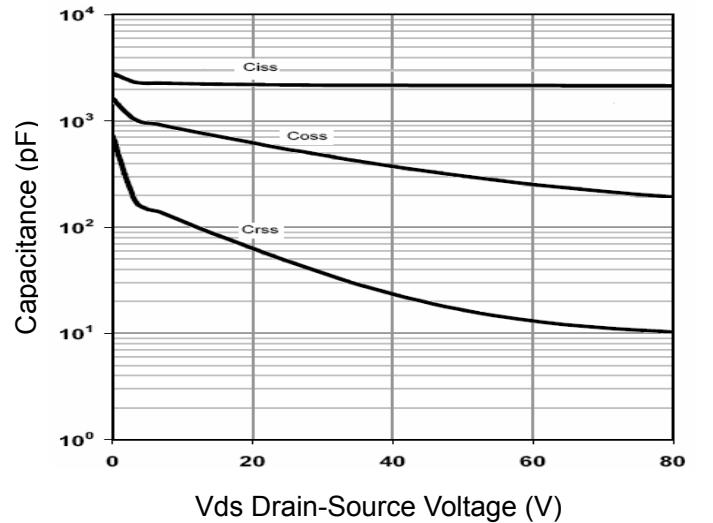
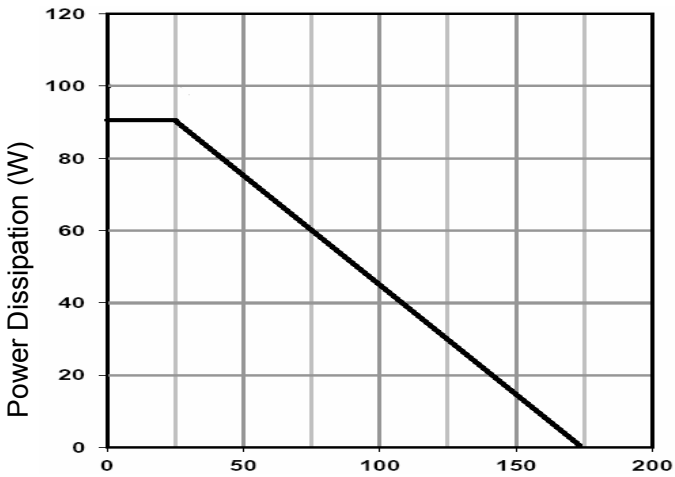
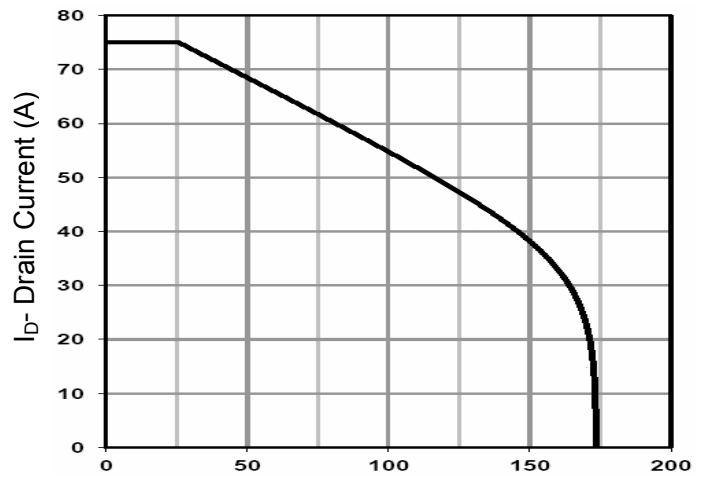


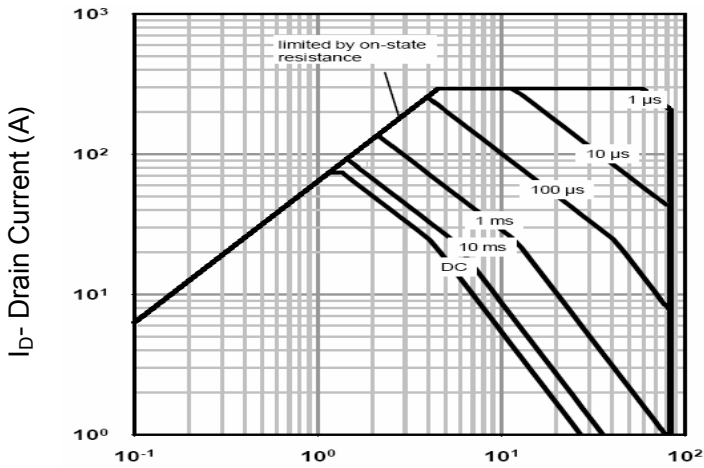
Figure 6 Capacitance vs Vds



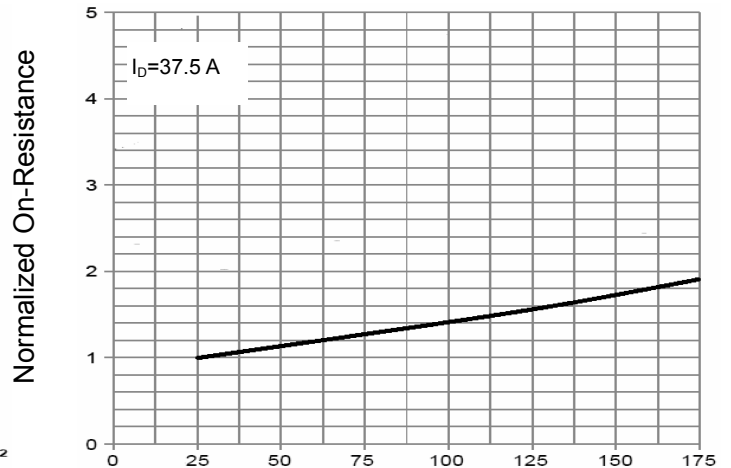
T_J-Junction Temperature(°C)
Figure 7 Power De-rating



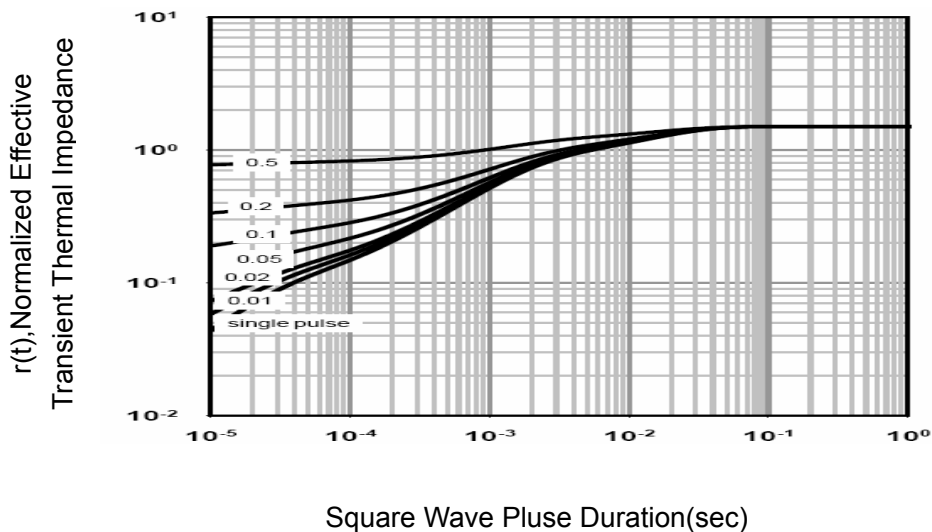
T_J-Junction Temperature (°C)
Figure 9 Current De-rating



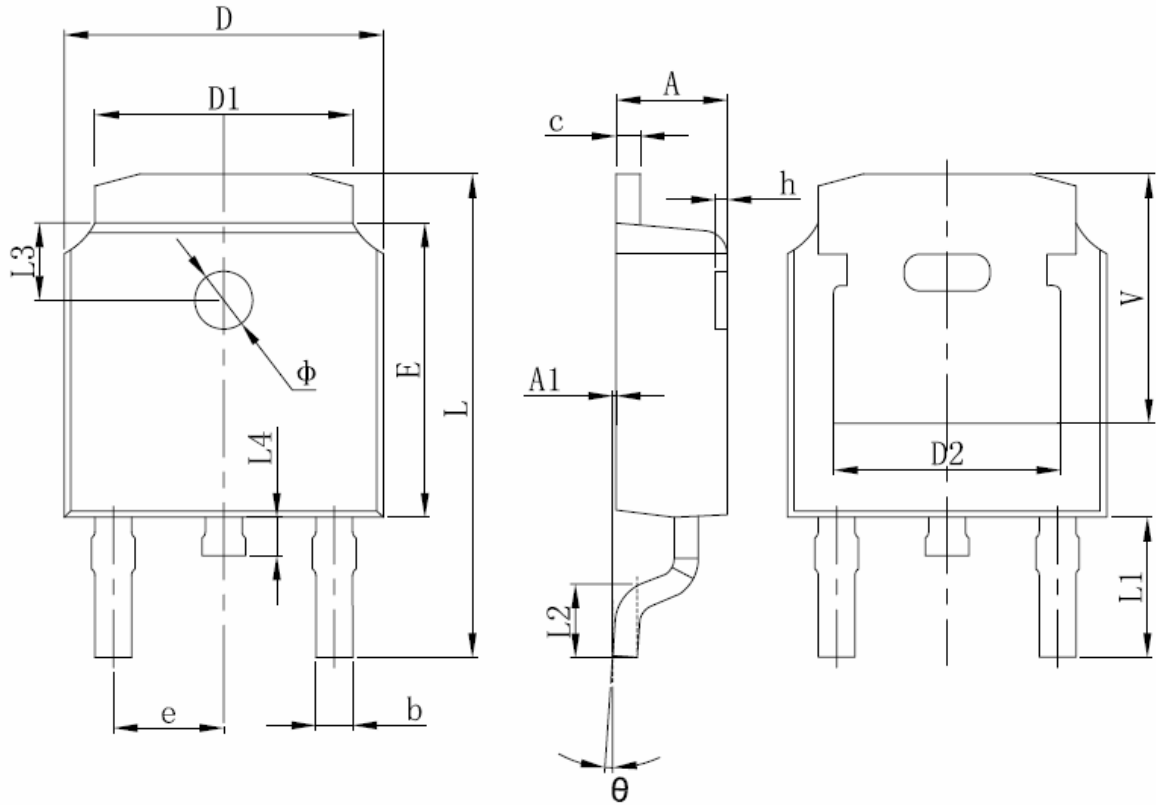
V_{ds} Drain-Source Voltage (V)
Figure 8 Safe Operation Area



T_J-Junction Temperature(°C)
Figure 10 Rdson-Junction Temperature



TO-252-2L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.635	0.770	0.025	0.030
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.712	10.312	0.382	0.406
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.250 REF.		0.207 REF.	

Attention

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