AC20P04S

P-Channel Enhancement Mode Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-40V	18mΩ@-10V	-20A
	28mΩ@-4.5V	

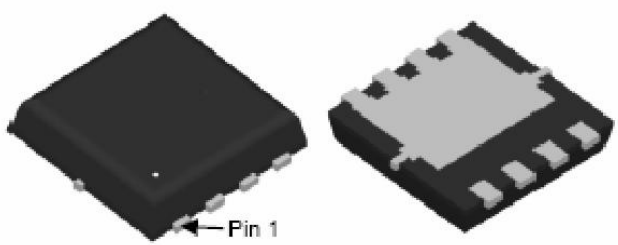
Feature

- High power and current handing capability
- Lead free product is acquired
- Surface mount package

Application

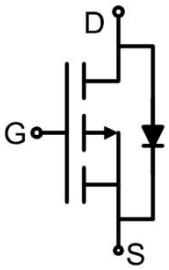
- Power management
- Load switch

Package

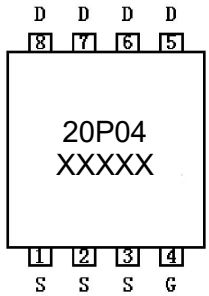


DFN3.3X3.3-8L

Circuit diagram



Marking



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P-Channel Enhancement Mode Power MOSFET

Absolute maximum ratings (T_A=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-40	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	-20	A
Pulsed Drain Current[1]	I_{DM}	-80	A
Power Dissipation	P_D	30	W
Thermal Resistance,Junction-to-Case[2]	$R_{\theta JC}$	4.17	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_A=25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}= 0V, I_D =-250μA	-40			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =-40V,V_{GS} = 0V			-1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V			±100	nA
Gate threshold voltage[3]	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =-250μA	-1.2	-1.8	-2.4	V
Drain-source on-resistance[3]	$R_{DS(on)}$	V_{GS} =-10V, I_D =-20A		14	18	mΩ
		V_{GS} =-4.5V, I_D =-20A		21.5	28	
Forward Transconductance[3]	g_{FS}	V_{DS} =-10V,I_D =-20A		25		S
Dynamic characteristics[4]						
Input Capacitance	C_{iss}	V_{DS} =-20V,V_{GS} =0V,f =1MHz		2800		pF
Output Capacitance	C_{oss}			300		
Reverse Transfer Capacitance	C_{rss}			275		
Total Gate Charge	Q_g	V_{DS} =-20V,V_{GS} =-10V, I_D =-20A		54		nC
Gate-Source Charge	Q_{gs}			8		
Gate-Drain Charge	Q_{gd}			11		
Turn-on delay time	$t_{d(on)}$	V_{DD}=-20V,V_{GS}=-10V, I_D =-20A,R_{GEN}=3Ω		11		nS
Turn-on rise time	t_r			9.4		
Turn-off delay time	$t_{d(off)}$			24		
Turn-off fall time	t_f			12		
Source-Drain Diode characteristics						
Diode Forward voltage[3]	V_{SD}	V_{GS} =0V, I_S=-20A			-1.2	V

Notes:

1) Repetitive Rating: Pulse width limited by maximum junction temperature.
2) Surface Mounted on FR4 Board, t ≤ 10 sec.
3) Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4) Guaranteed by design, not subject to production.

Typical Characteristics

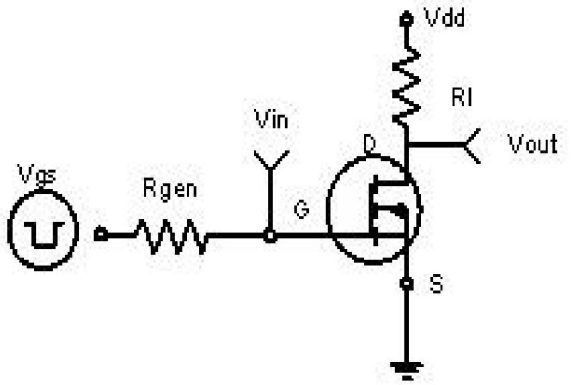


Figure 1 Switching Test Circuit

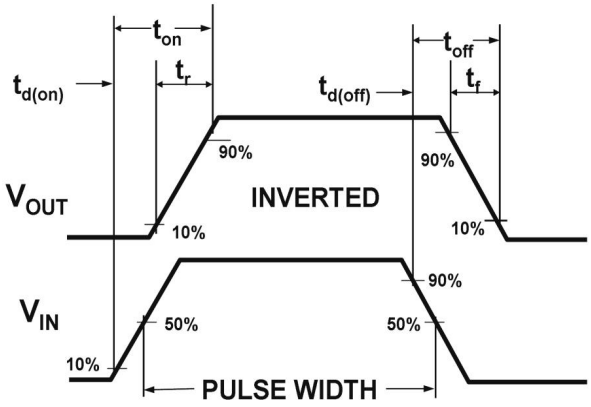
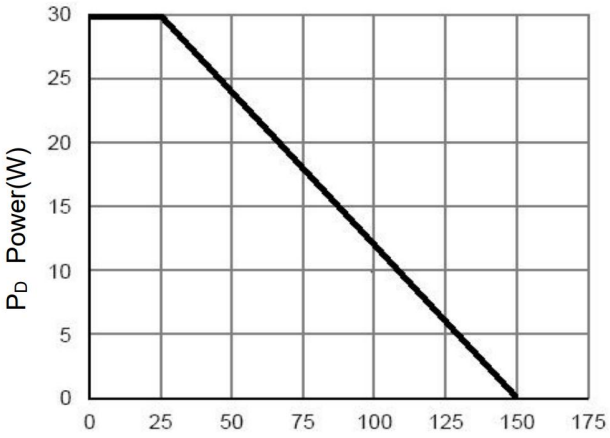
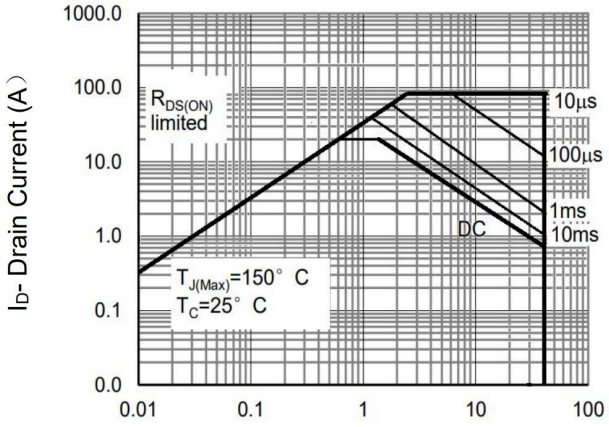


Figure 2 Switching Waveforms



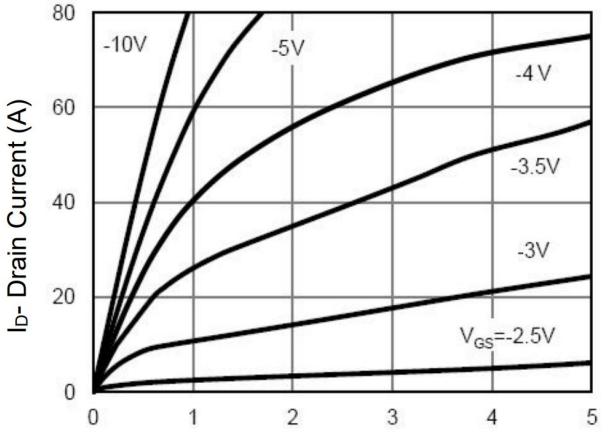
T_J-Junction Temperature(℃)

Figure 3 Power Dissipation



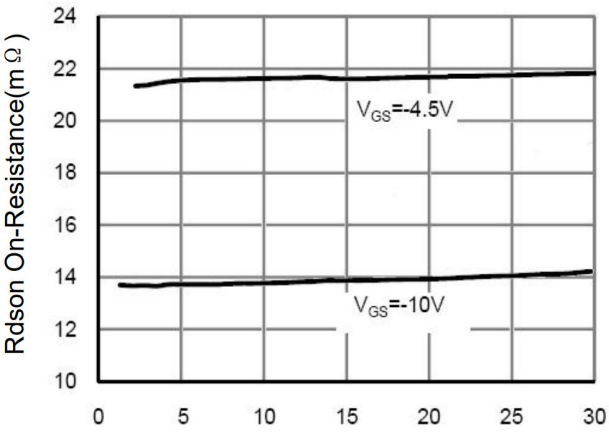
Vds Drain-Source Voltage (V)

Figure 4 Safe Operation Area



Vds Drain-Source Voltage (V)

Figure 5 Output Characteristics



I_D- Drain Current (A)

Figure 6 Drain-Source On-Resistance

Typical Characteristics

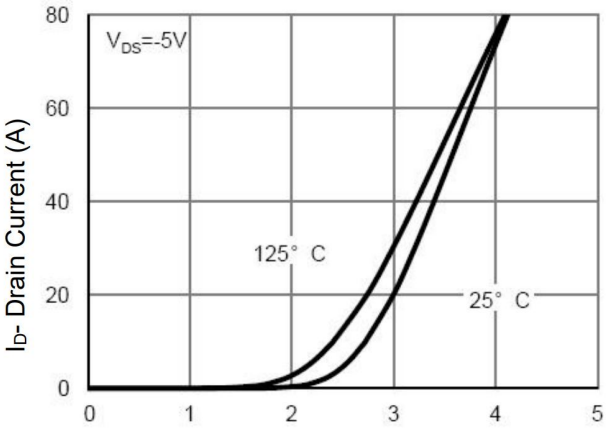


Figure 7 Transfer Characteristics

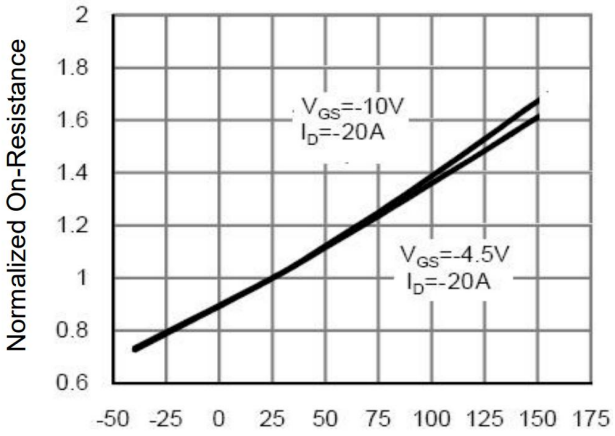


Figure 8 Drain-Source On-Resistance

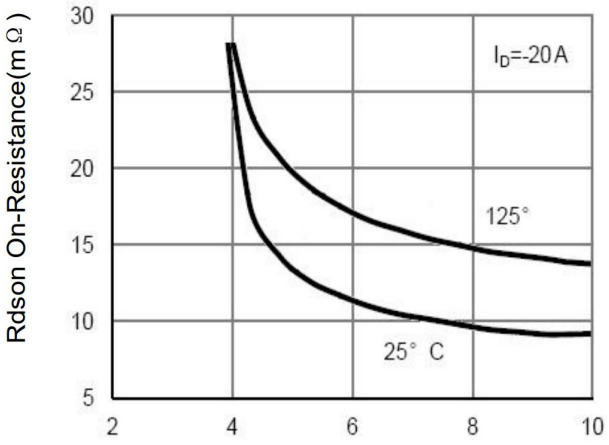


Figure 9 Rdson vs Vgs

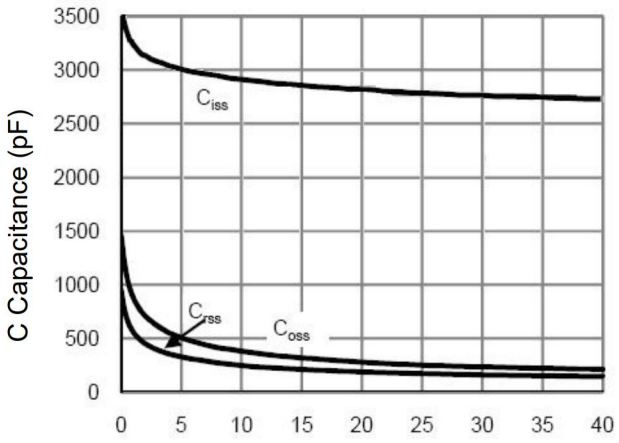


Figure 10 Capacitance vs Vds

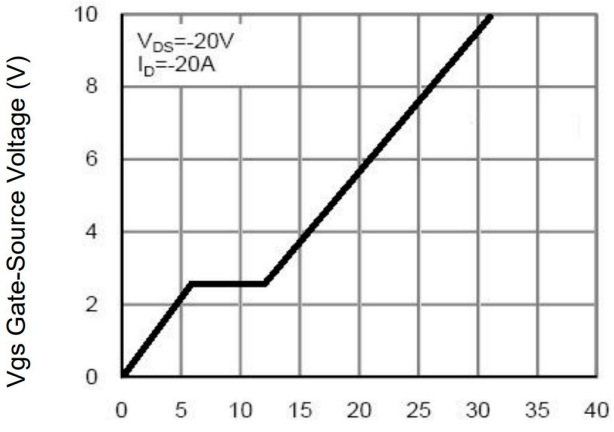


Figure 11 Gate Charge

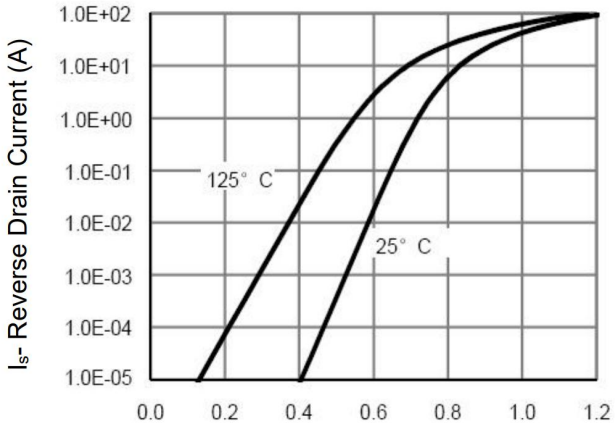


Figure 12 Source- Drain Diode Forward

Typical Characteristics

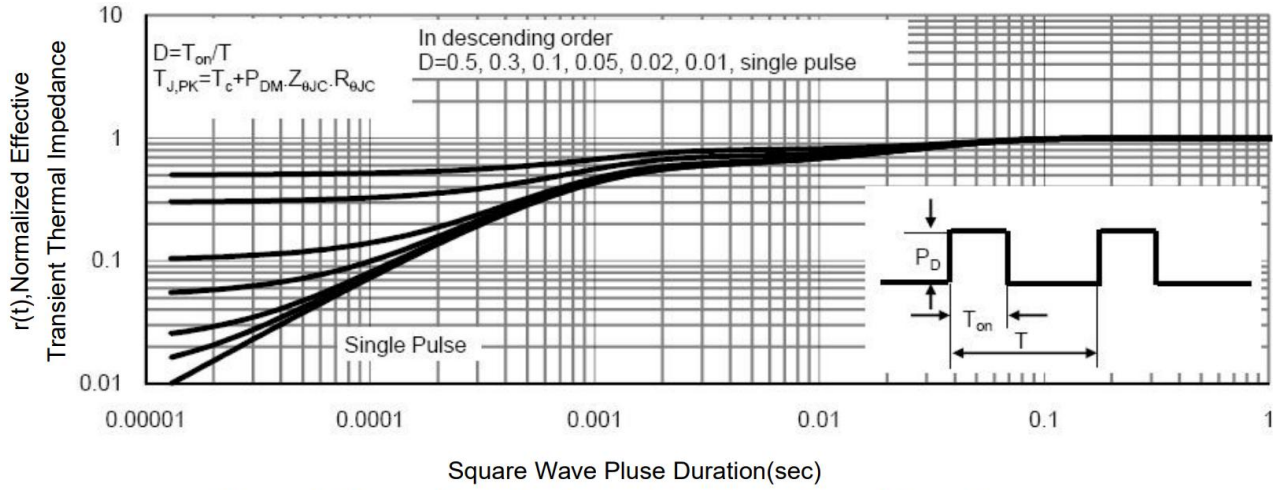
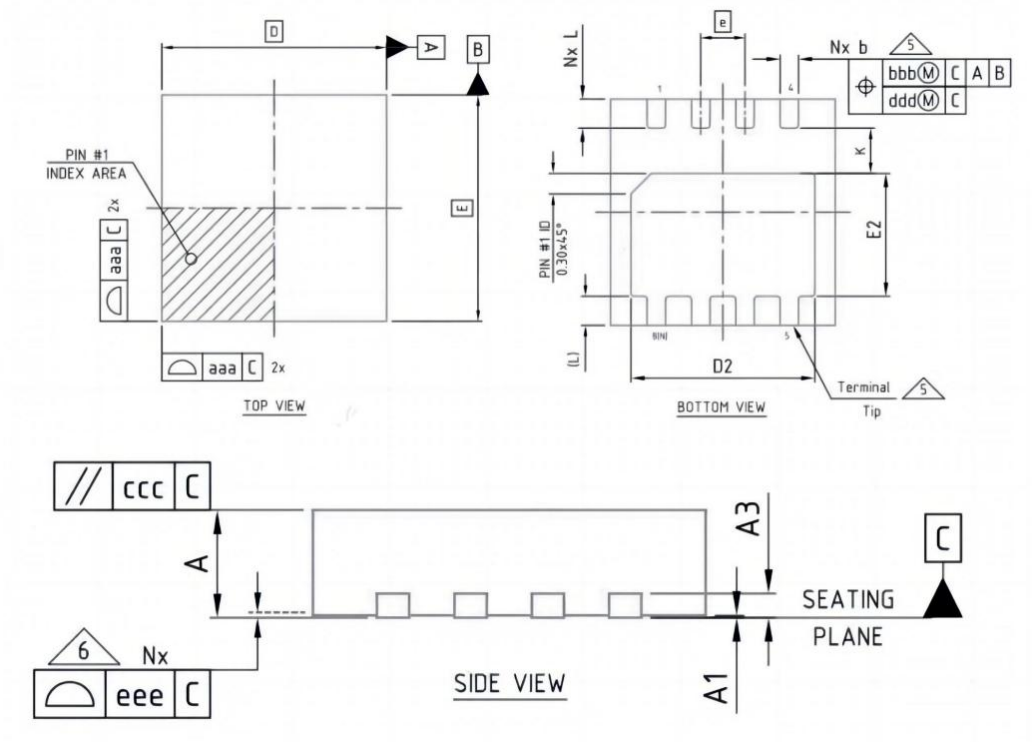


Figure 13 Normalized Maximum Transient Thermal Impedance

DFN3.3X3.3-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A3	0.200 REF.		0.008 REF.	
b	0.250	0.350	0.010	0.014
D	3.300 BSC.		0.130 BSC.	
E	3.300 BSC.		0.130 BSC.	
e	0.650 BSC.		0.026 BSC.	
D2	2.550	2.800	0.100	0.110
E2	1.640	1.890	0.065	0.074
K	0.500	-	0.020	-
L	0.325	0.525	0.013	0.021