

Product Summary

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

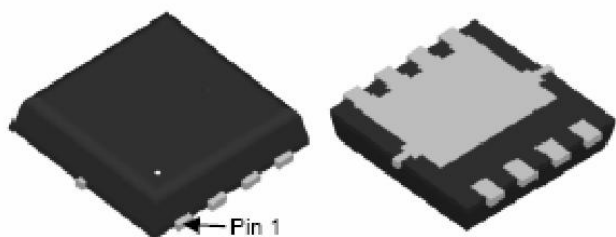
Feature

- High power and current handing capability
- Lead free product is acquired
- Surface mount package
- Suffix "-Q1" for AEC-Q101

Application

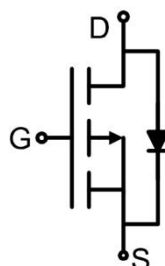
- Power management
- Load switch

Package

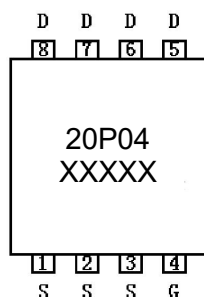


DFN3.3X3.3-8L

Circuit diagram



Marking



Absolute maximum ratings ($T_A=25^{\circ}\text{C}$ 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	$^{\circ}\text{C/W}$
Junction Temperature	T_J	150	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-55 ~ +150	$^{\circ}\text{C}$

Electrical characteristics ($T_A=25^{\circ}\text{C}$ 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, $t \leq 10$ sec.
- 3) Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
- 4) Guaranteed by design, not subject to production.

Typical Characteristics

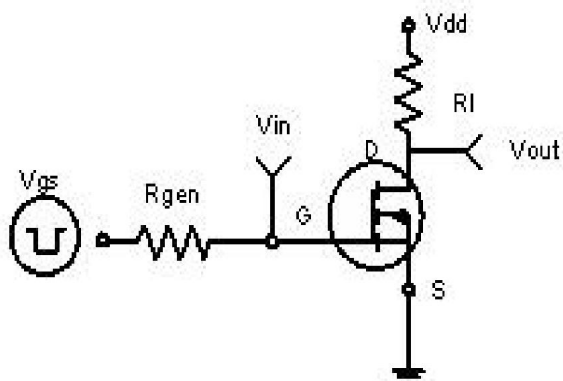


Figure 1 Switching Test Circuit

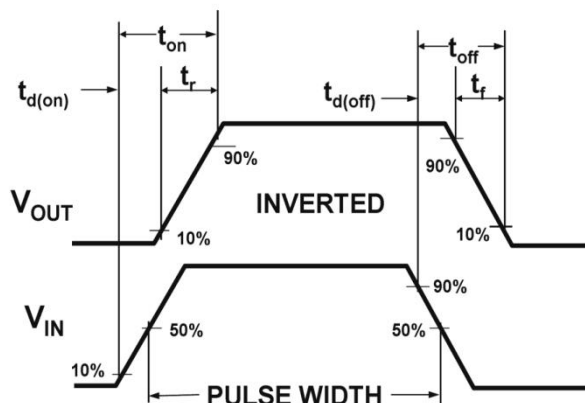


Figure 2 Switching Waveforms

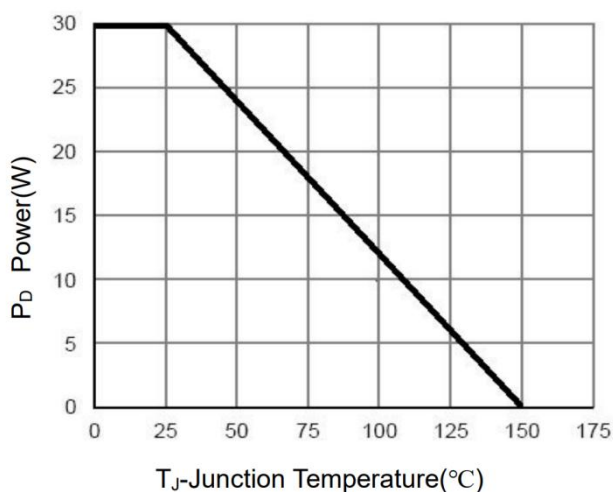


Figure 3 Power Dissipation

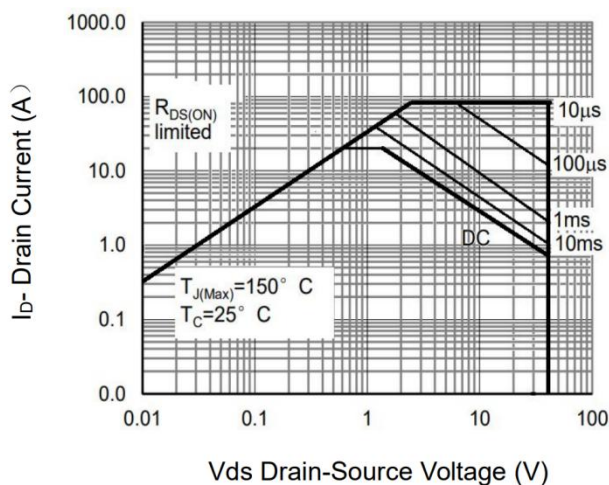


Figure 4 Safe Operation Area

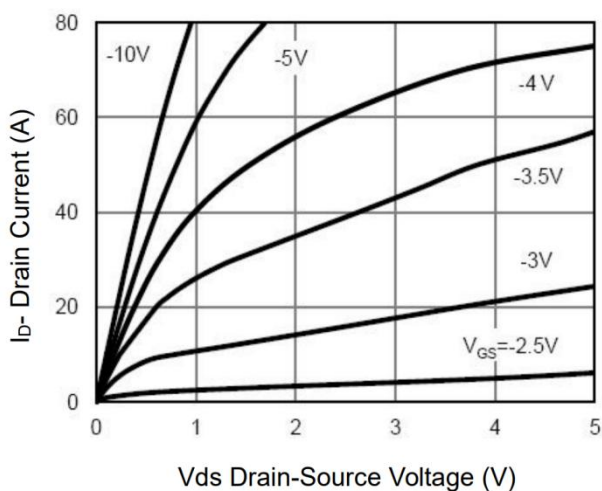


Figure 5 Output Characteristics

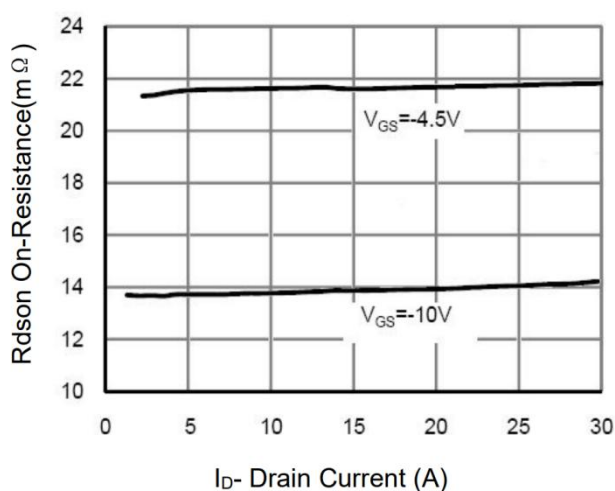


Figure 6 Drain-Source On-Resistance

Typical Characteristics

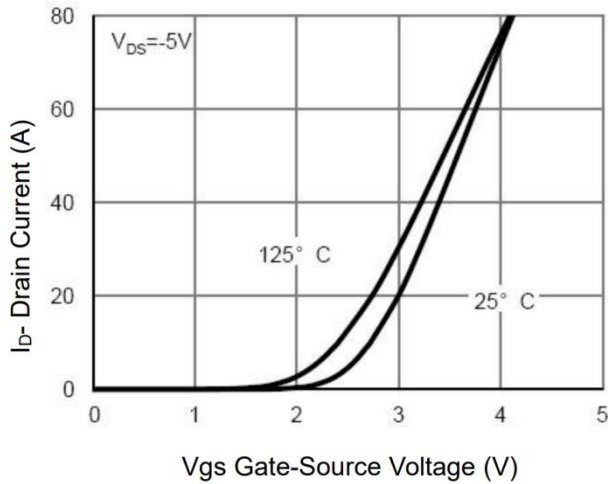


Figure 7 Transfer Characteristics

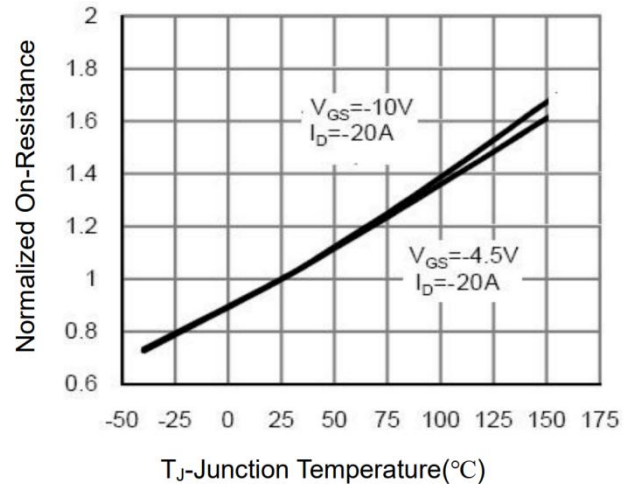


Figure 8 Drain-Source On-Resistance

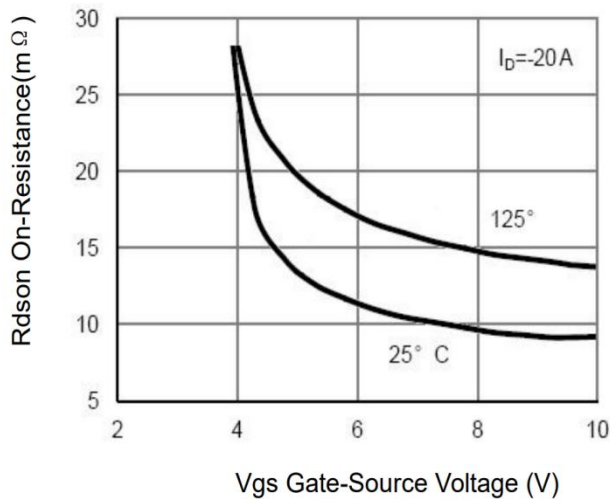


Figure 9 Rdson vs Vgs

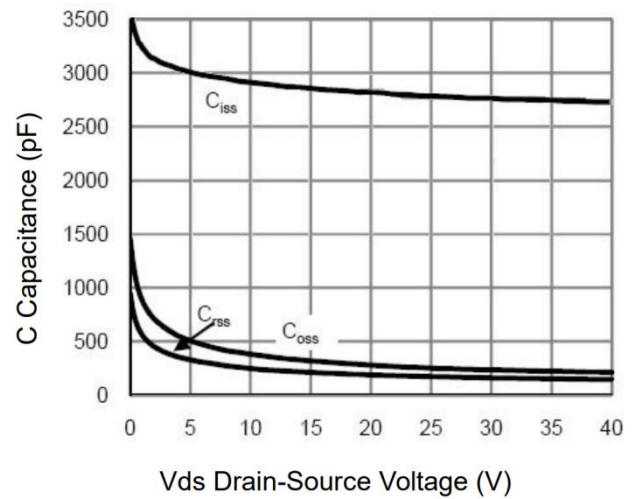


Figure 10 Capacitance vs Vds

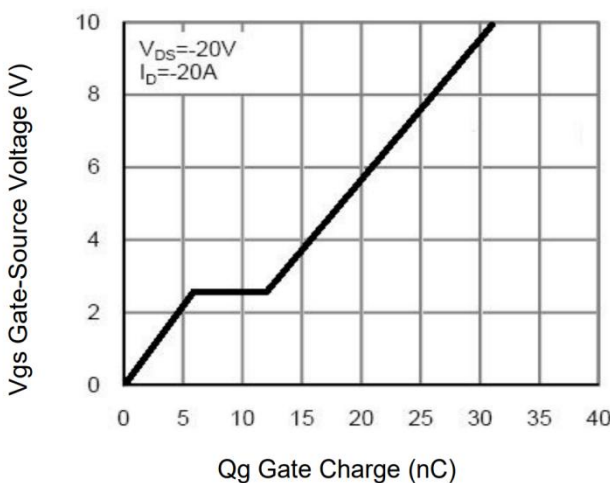


Figure 11 Gate Charge

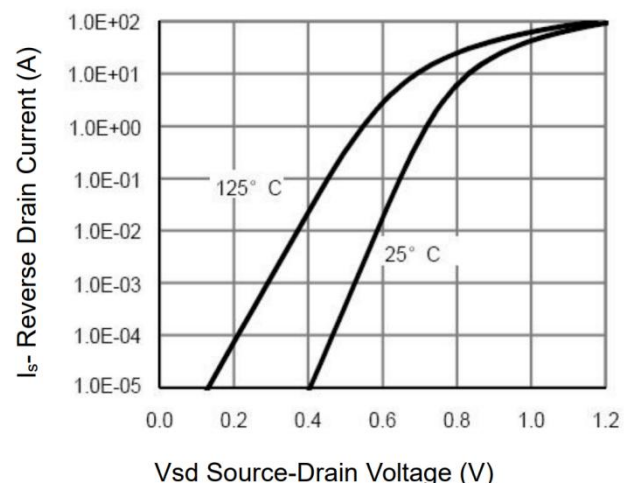


Figure 12 Source- Drain Diode Forward

Typical Characteristics

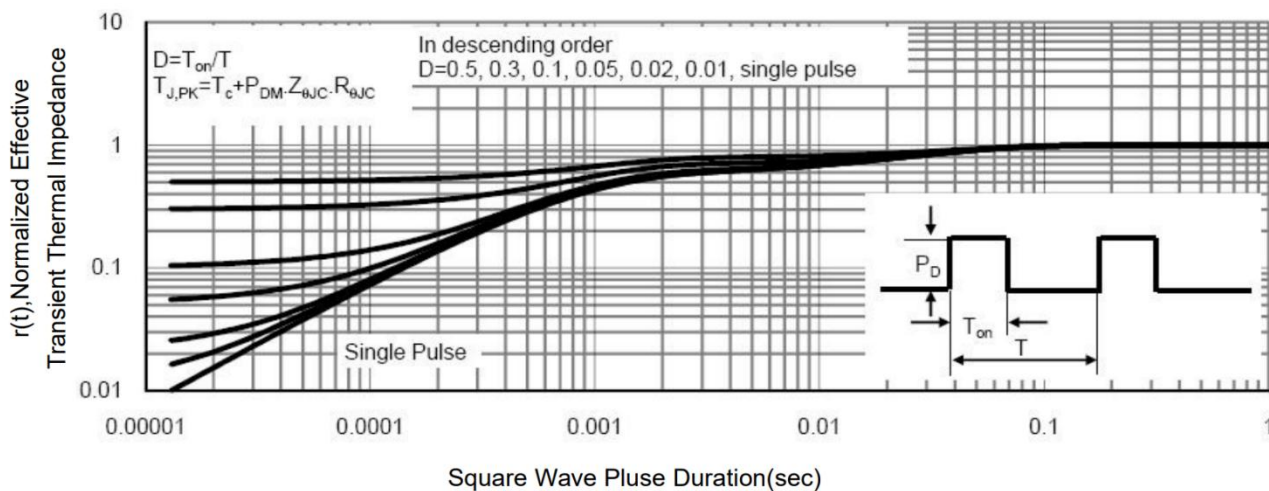
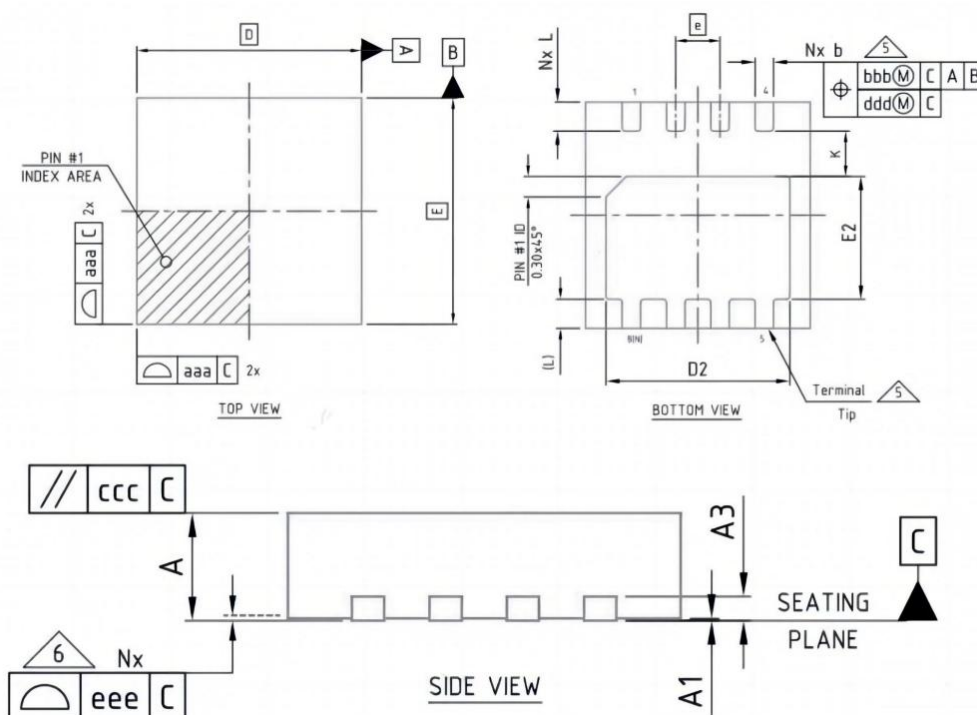


Figure 13 Normalized Maximum Transient Thermal Impedance

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