

Product Summary

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

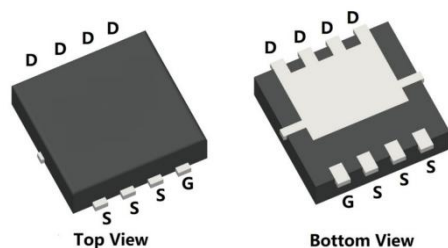
Feature

- High power and current handling capability
- Surface mount package
- Suffix “-Q1” for AEC-Q101

Application

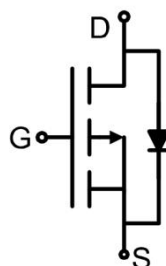
- Power management
- Load switch

Package

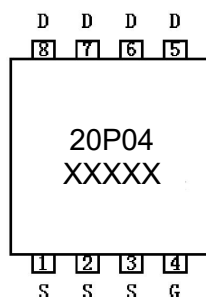


PDFN3.3*3.3-8L

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	$^{\circ}\text{C/W}$
Operating Junction Temperature	T_J	-55 ~ +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	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-40			V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=-40V, V_{GS}=0V$			-1	μA
Gate-body leakage current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Gate threshold voltage ³⁾	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.2	-1.8	-2.4	V
Drain-source on-resistance ³⁾	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-20A$		14	18	m Ω
		$V_{GS}=-4.5V, I_D=-20A$		21.5	28	
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	$t_{d(on)}$	$V_{DS}=-20V, V_{GS}=-10V$ $I_D=-20A, R_G=3\Omega$		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 Current	I_S				-20	A
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, $t \leq 10\text{sec}$.
- 3) Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
- 4) Guaranteed by design, not subject to production testing.

Typical Characteristics

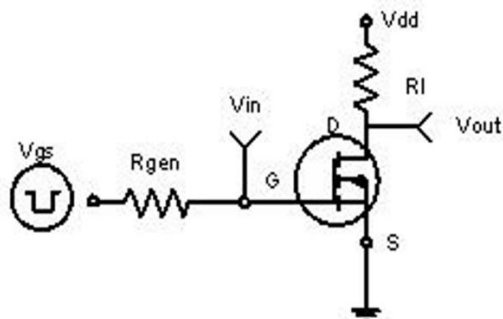


Figure 1 Switching Test Circuit

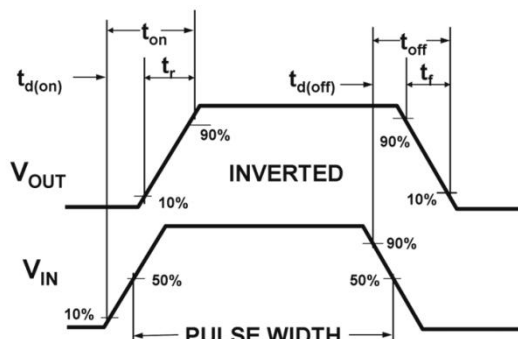


Figure 2 Switching Waveforms

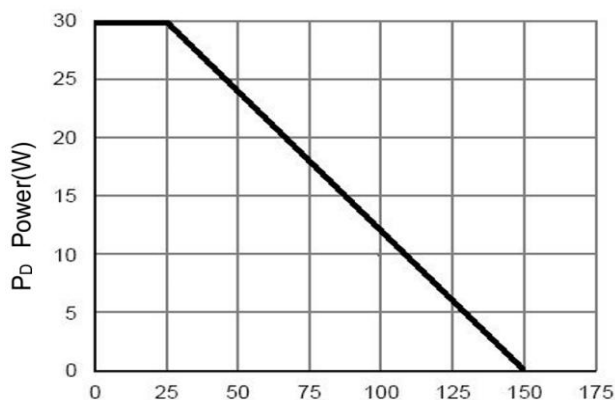


Figure 3 Power Dissipation

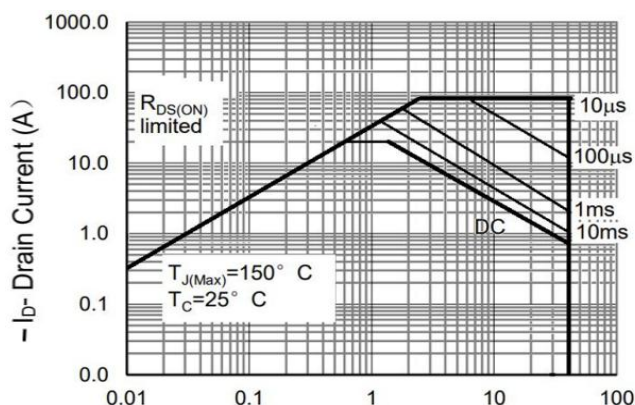


Figure 4 Safe Operation Area

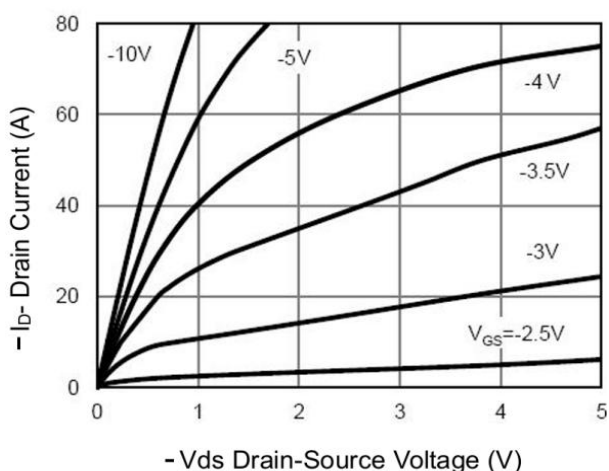


Figure 5 Output Characteristics

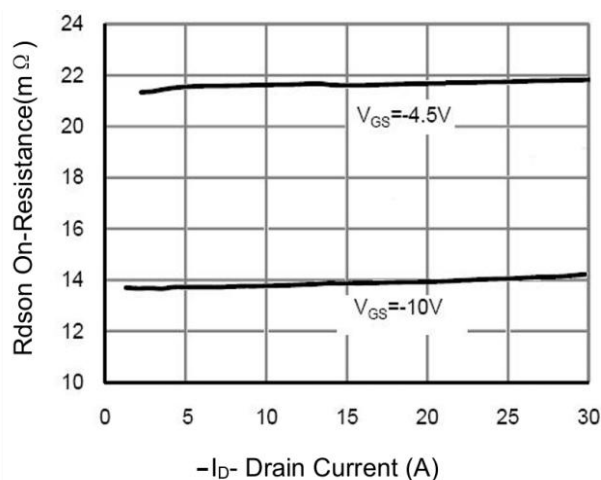


Figure 6 Drain-Source On-Resistance

Typical Characteristics

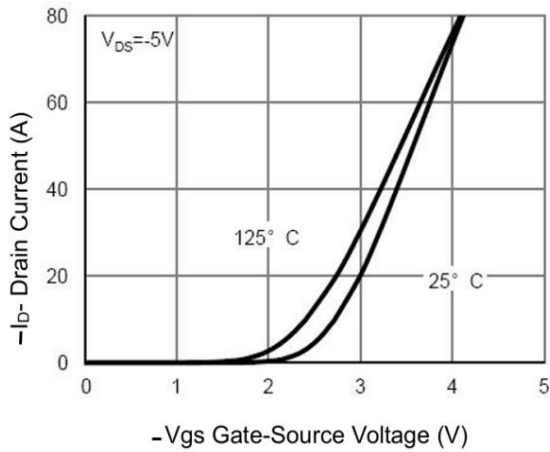


Figure 7 Transfer Characteristics

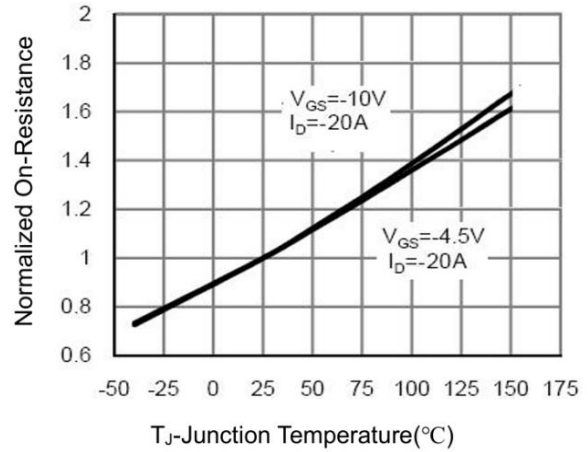


Figure 8 Drain-Source On-Resistance

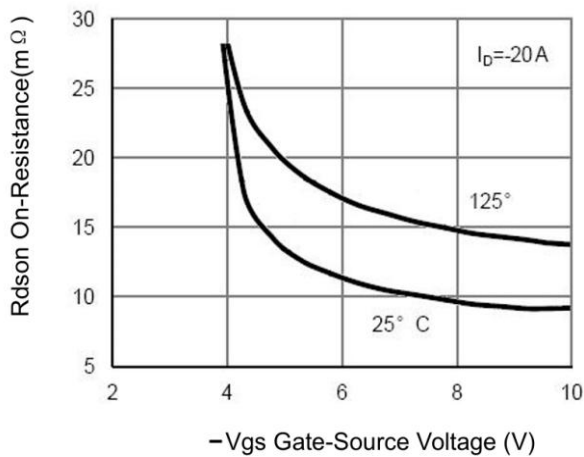


Figure 9 Rdson vs Vgs

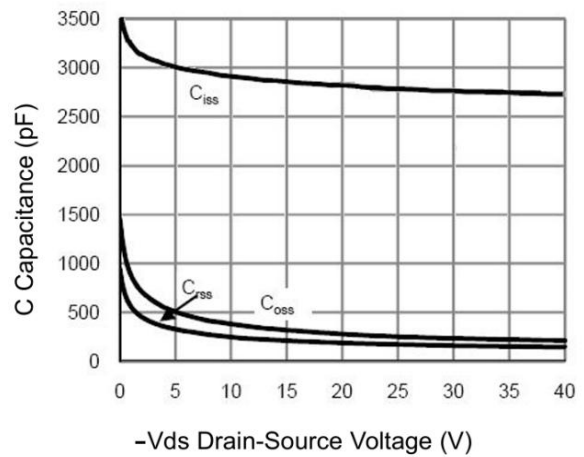


Figure 10 Capacitance vs Vds

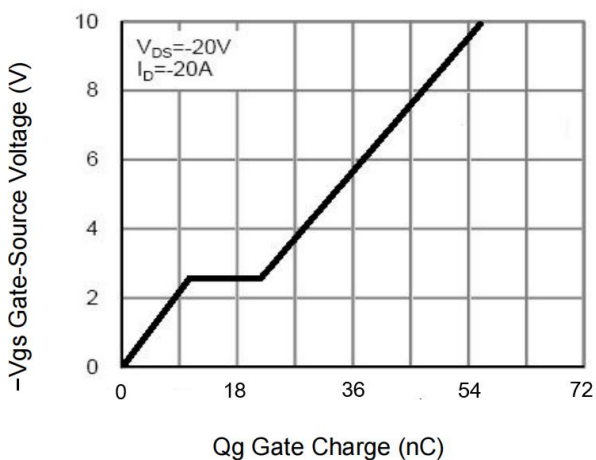


Figure 11 Gate Charge

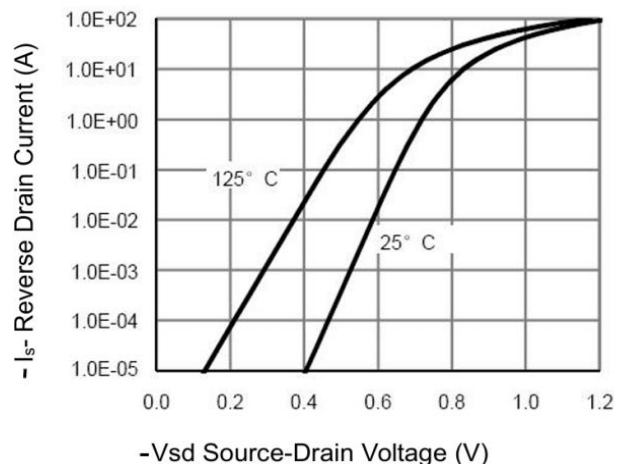


Figure 12 Source- Drain Diode Forward

Typical Characteristics

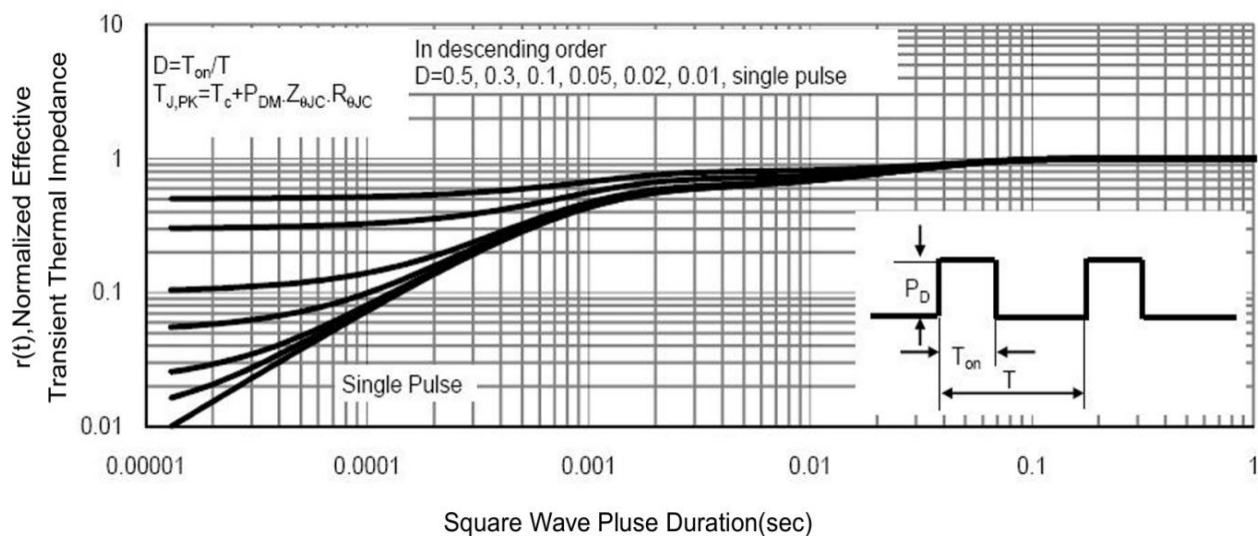
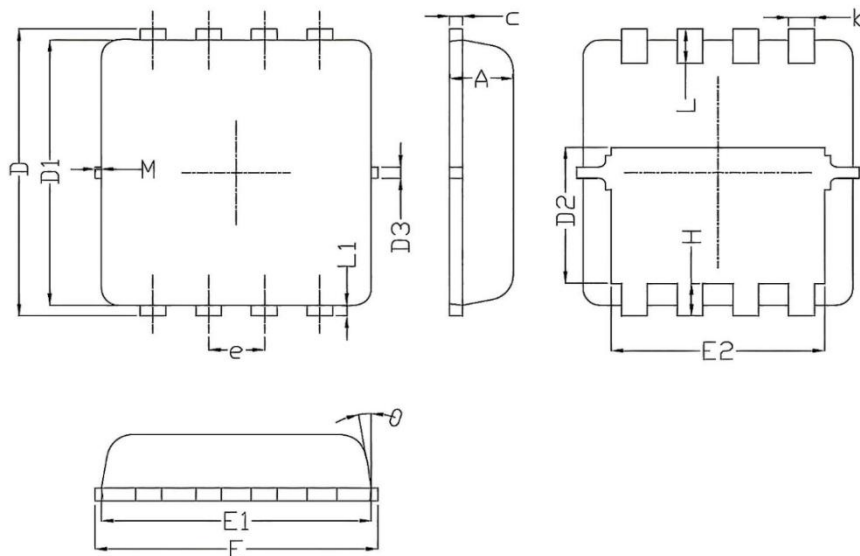


Figure 13 Normalized Maximum Transient Thermal Impedance

PDFN3.3*3.3-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.800	0.028	0.031
b	0.250	0.350	0.010	0.014
c	0.100	0.250	0.004	0.010
D	3.250	3.450	0.128	0.136
D1	3.000	3.200	0.118	0.126
D2	1.480	1.680	0.058	0.066
D3	0.130 RFE.		0.005 RFE.	
E	3.200	3.400	0.126	0.134
E1	3.000	3.200	0.118	0.126
E2	2.390	2.590	0.094	0.102
e	0.650 BSC.		0.026 BSC.	
H	0.300	0.500	0.012	0.020
L	0.300	0.500	0.012	0.020
L1	0.130 RFE.		0.005 RFE.	
M	-	0.150	-	0.006
θ	-	12°	-	12°