

### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
40V	2.8mΩ@10V	65A
	4.2mΩ@4.5V	

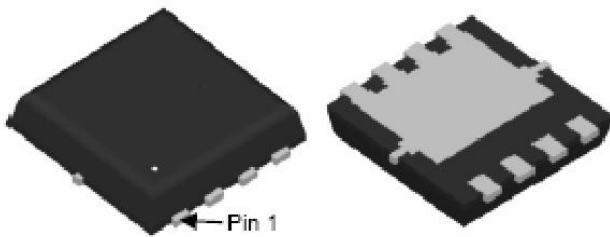
### Feature

- Excellent gate charge x RDS(on) product(FOM)
- Very low on-resistance RDS(on)
- Suffix "-Q1" for AEC-Q101

### Application

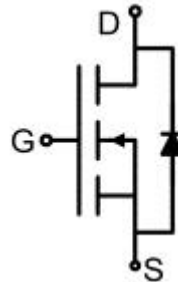
- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

### Package

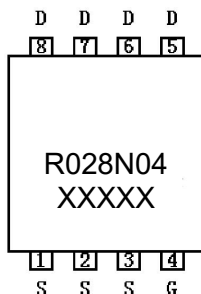


DFN3.3X3.3-8L

### Circuit diagram



### Marking



### Absolute maximum ratings (Tc=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DS</sub>	40	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current	I <sub>D</sub>	65	A
Continuous Drain Current(T <sub>C</sub> =100 °C )	I <sub>D</sub> (100 °C)	45.5	A
Pulsed Drain Current	I <sub>DM</sub>	260	A
Power Dissipation	P <sub>D</sub>	55	W
Thermal Resistance,Junction-to-Case	R <sub>θJC</sub>	2.3	°C/W
Single pulse avalanche energy	E <sub>AS</sub>	500	mJ
Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature	T <sub>STG</sub>	-55 ~ +150	°C

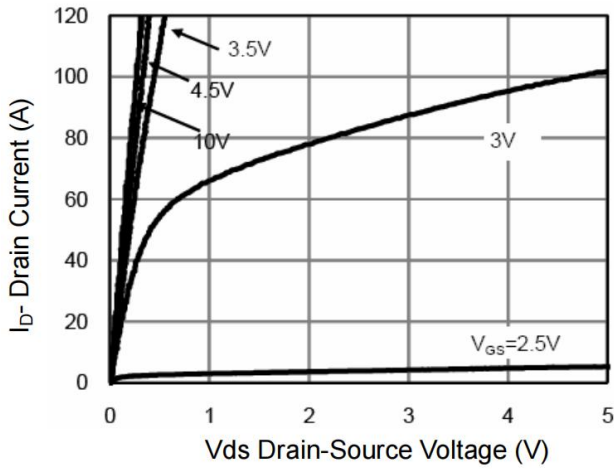
### Electrical characteristics (Tc=25 °C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	40			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =40V, V <sub>GS</sub> = 0V			1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> = 0V			±100	nA
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0	1.5	2.0	V
Drain-source on-resistance <sup>1)</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A		2.2	2.8	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A		3.3	4.2	
<b>Dynamic characteristics<sup>2)</sup></b>						
Input Capacitance	C <sub>iSS</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V, f =1MHz		2100		pF
Output Capacitance	C <sub>oss</sub>			773		
Reverse Transfer Capacitance	C <sub>rSS</sub>			15.5		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =10V, I <sub>D</sub> =20A		35		nC
Gate-Source Charge	Q <sub>gs</sub>			6.2		
Gate-Drain Charge	Q <sub>gd</sub>			5.1		
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> =20V, V <sub>GS</sub> =10V, I <sub>D</sub> =20A, R <sub>G</sub> =1.6Ω		7.5		nS
Turn-on rise time	t <sub>r</sub>			4.0		
Turn-off delay time	t <sub>d(off)</sub>			37		
Turn-off fall time	t <sub>f</sub>			7.5		
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current	I <sub>S</sub>				65	A
Diode Forward voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =20A			1.2	V
Reverse Recovery Time	t <sub>rr</sub>	T <sub>J</sub> = 25°C, I <sub>F</sub> = I <sub>S</sub> di/dt = 100A/μs <sup>1)</sup>		14		nS
Reverse Recovery Charge	Q <sub>rr</sub>				21	

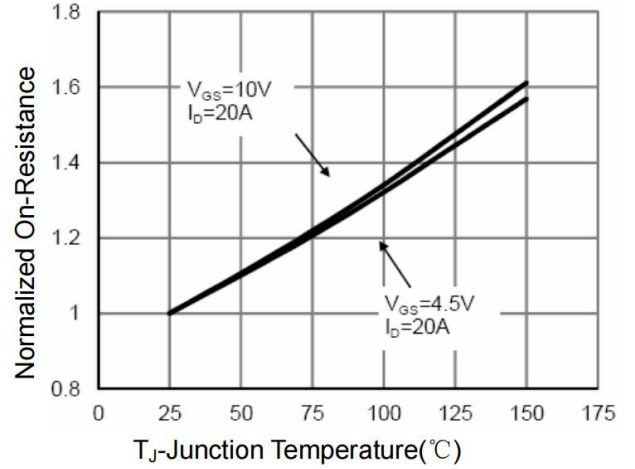
Notes:

- 1) Surface Mounted on FR4 Board, t ≤ 10 sec.
- 2) Guaranteed by design, not subject to production.
- 3) EAS condition : T<sub>J</sub>=25 ,V °C DD=20V, VG=10V, L=0.5mH, R<sub>G</sub>=25Ω.

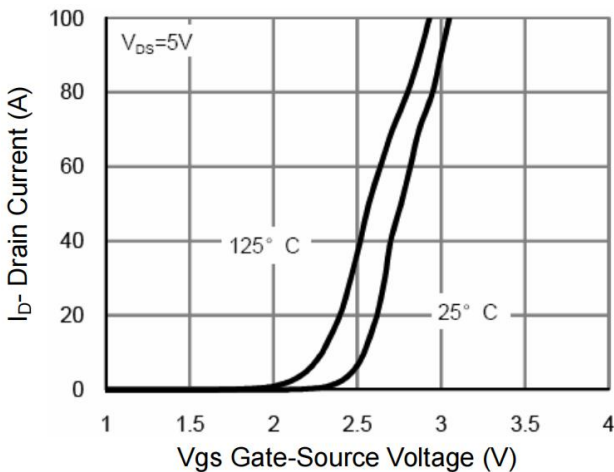
## Typical Characteristics



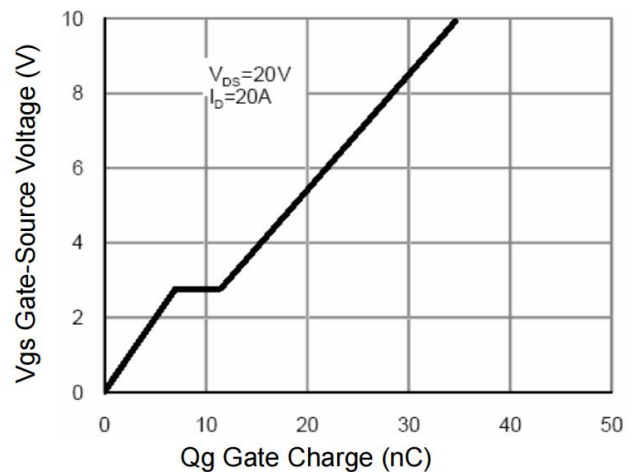
**Figure 1 Output Characteristics**



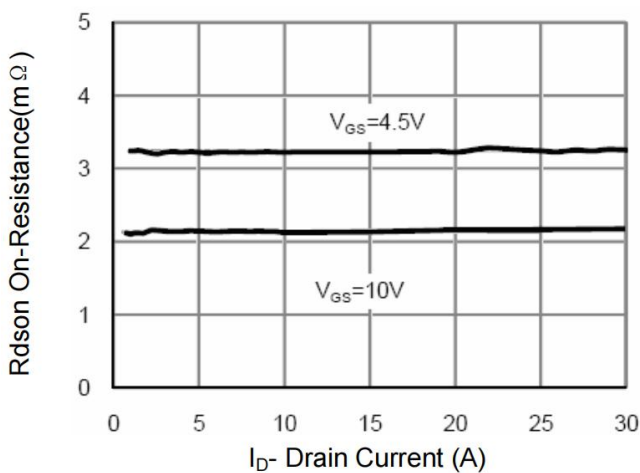
**Figure 2 Rdson-Junction Temperature**



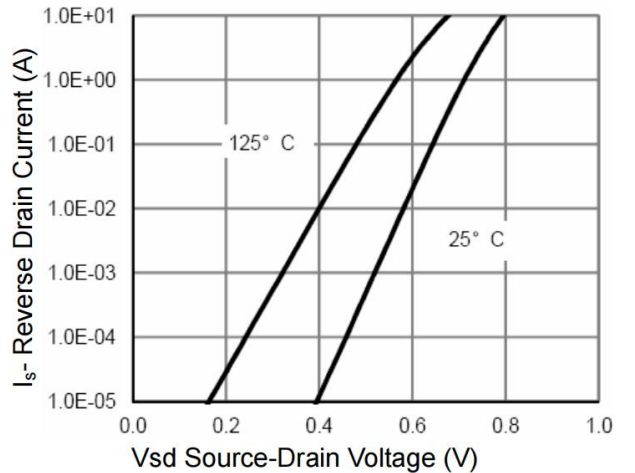
**Figure 3 Transfer Characteristics**



**Figure 4 Gate Charge**

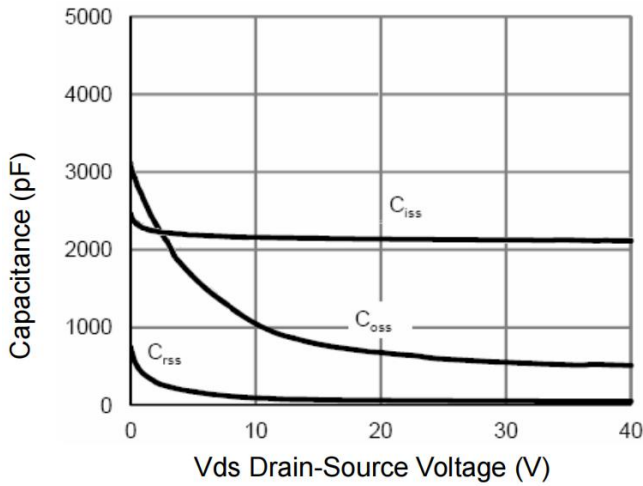


**Figure 5 Rdson- Drain Current**

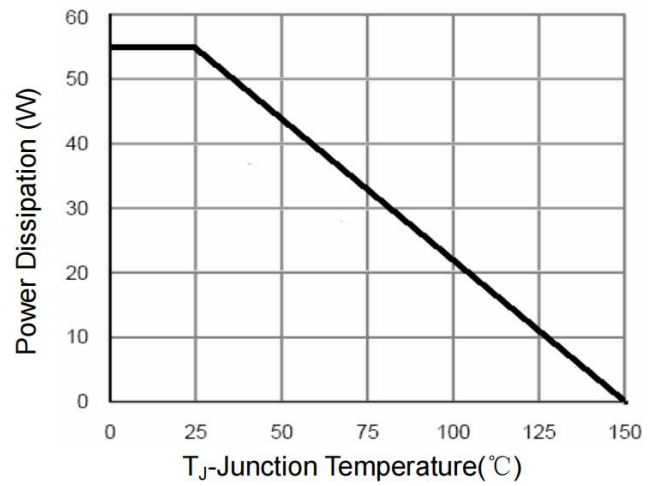


**Figure 6 Source- Drain Diode Forward**

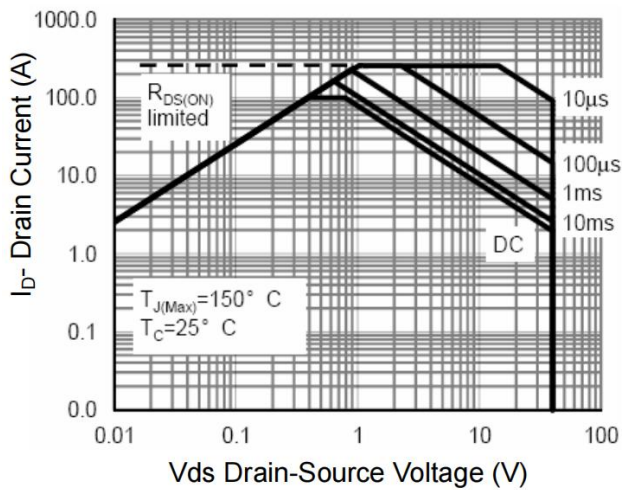
## Typical Characteristics



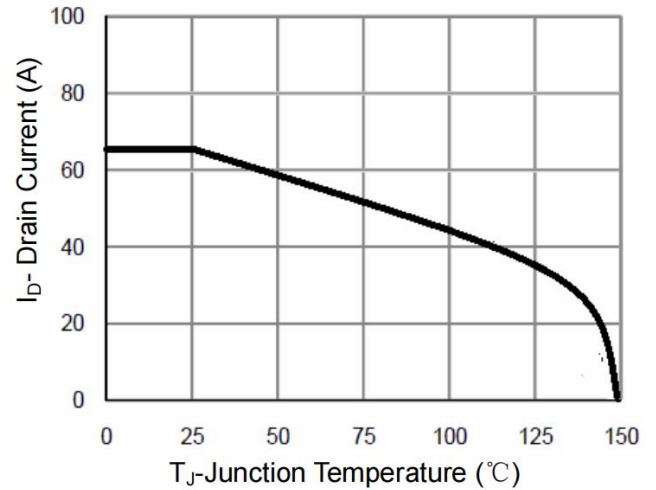
**Figure 7 Capacitance vs Vds**



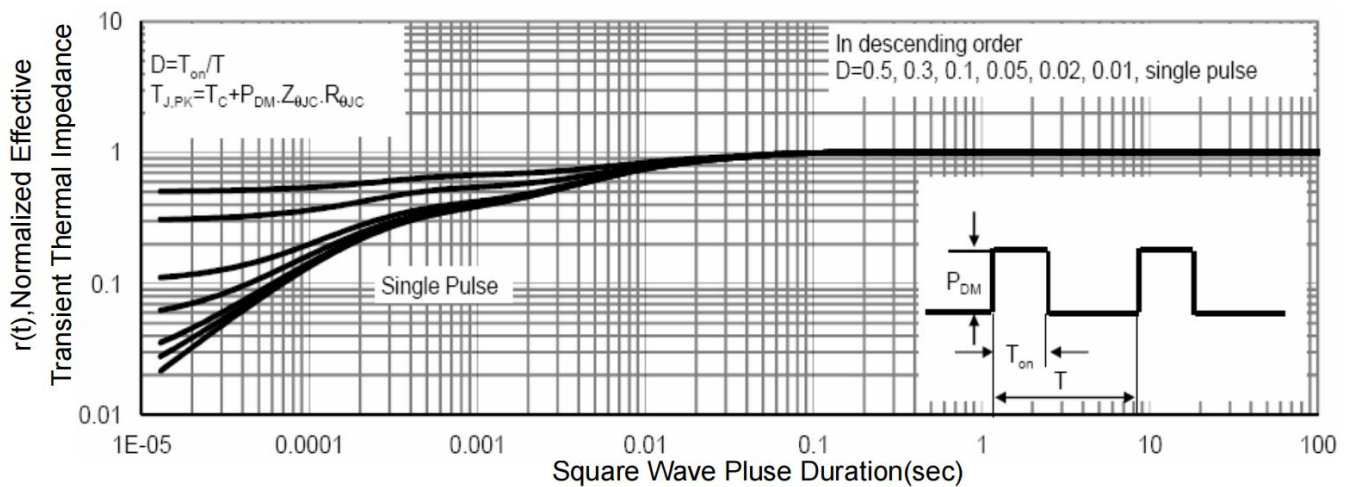
**Figure 8 Power De-rating**



**Figure 9 Safe Operation Area**

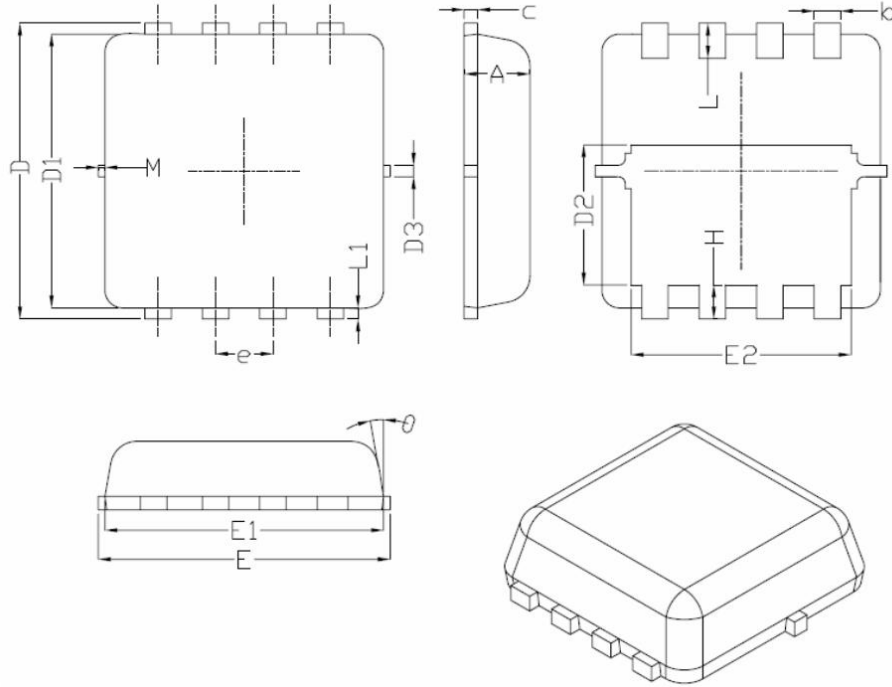


**Figure 10 Current De-rating**



**Figure 11 Normalized Maximum Transient Thermal Impedance**

### DFN3.3X3.3-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.650	0.850	0.025	0.034
b	0.200	0.400	0.007	0.016
c	0.100	0.250	0.003	0.010
D	3.250	3.450	0.127	0.136
D1	3.000	3.200	0.118	0.126
D2	1.480	1.680	0.058	0.067
D3	0.130 REF		0.051 REF	
E	3.200	3.400	0.125	0.134
E1	3.000	3.200	0.118	0.126
E2	2.390	2.590	0.094	0.102
H	0.300	0.500	0.011	0.020
L	0.300	0.500	0.011	0.020
L1	0.130 REF		0.051 REF	
M	0.000	0.150	0.000	0.006
e	0.650 REF		0.026 REF	
θ	8 °	12 °	8 °	12 °