

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-40V	33mΩ@-10V	-6A
	45mΩ@-4.5V	

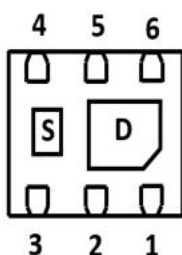
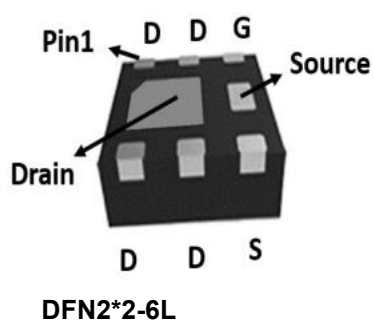
Feature

- Advanced trench MOSFET process technology
- Ultra low on-resistance with low gate charge
- Suffix "-Q1" for AEC-Q101

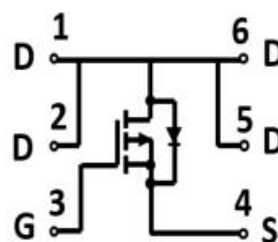
Application

- PWM applications
- Load switch
- Battery charge in cellular handset

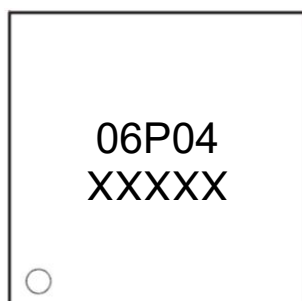
Package



Circuit diagram



Marking



Absolute maximum ratings (T_A=25°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	-6	A
Pulsed Drain Current ¹⁾	I _{DM}	-38	A
Power Dissipation	P _D	2.1	W
Thermal Resistance Junction to Ambient ²⁾	R _{θJA}	59.5	°C/W
Operating Junction Temperature	T _J	-55 ~ +150	°C
Storage Temperature	T _{STG}	-55 ~ +150	°C

Electrical characteristics (T_A=25°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 _{DS} =0V, V _{GS} =±20V			±100	nA
Gate threshold voltage ³⁾	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-1.1	-1.7	-2.1	V
Drain-source on-resistance ³⁾	R _{DS(on)}	V _{GS} =-10V, I _D =-6A		26	33	mΩ
		V _{GS} =-4.5V, I _D =-5A		34	45	
Dynamic characteristics ⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =-20V, V _{GS} =0V, f =1MHz		964		pF
Output Capacitance	C _{oss}			109		
Reverse Transfer Capacitance	C _{rss}			96		
Total Gate Charge	Q _g	V _{DS} =-20V, V _{GS} =-10V I _D =-6A		22.9		nC
Gate-Source Charge	Q _{gs}			3.5		
Gate-Drain Charge	Q _{gd}			5.3		
Turn-on delay time	t _{d(on)}	V _{DS} =-20V, V _{GS} =-10V I _D =-6A, R _G =10Ω		5.5		nS
Turn-on rise time	t _r			14		
Turn-off delay time	t _{d(off)}			24		
Turn-off fall time	t _f			12		
Source-Drain Diode characteristics						
Diode Forward Current ²⁾	I _S				-6	A
Diode Forward voltage ³⁾	V _{SD}	V _{GS} =0V, I _S =-6A			-1.2	V

Notes:

- 1) Repetitive Rating: Pulse width limited by maximum junction temperature.
- 2) Device mounted on FR-4 substrate PC board, 2oz copper, with thermal vias to bottom layer 1inch square copper plate.
- 3) Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
- 4) Guaranteed by design, not subject to production.

Typical Characteristics

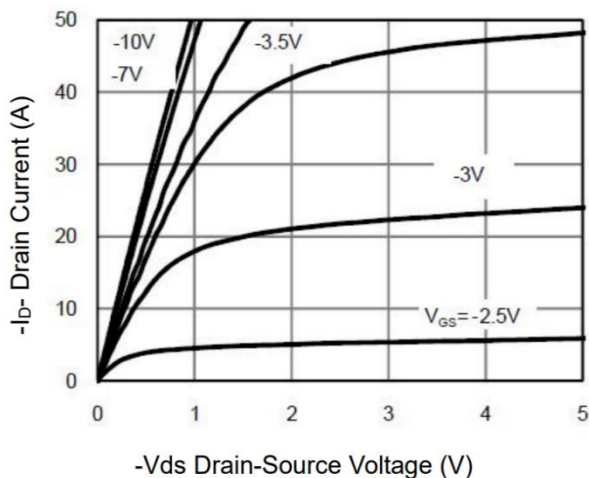


Figure 1 Output Characteristics

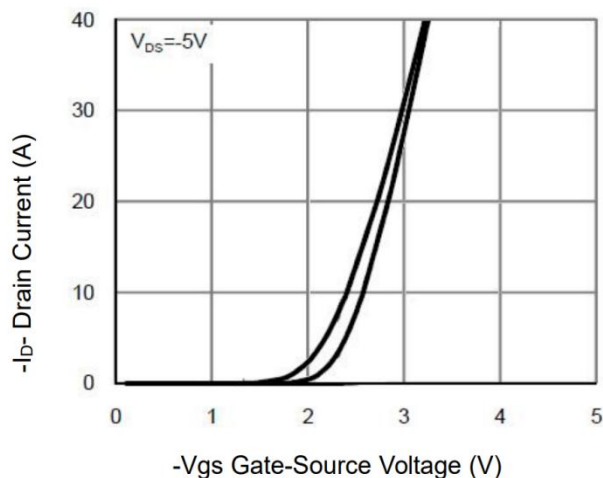


Figure 2 Transfer Characteristics

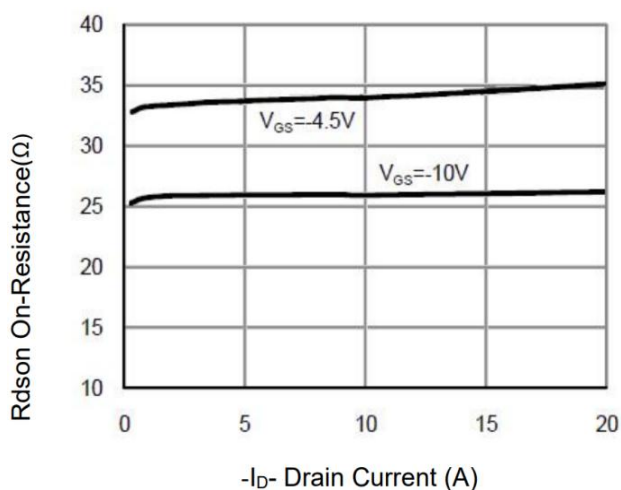


Figure 3 Rdson- Drain Current

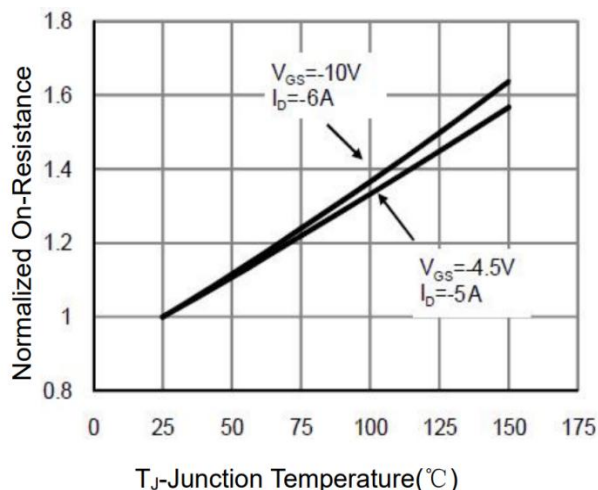


Figure 4 Rdson-Junction Temperature

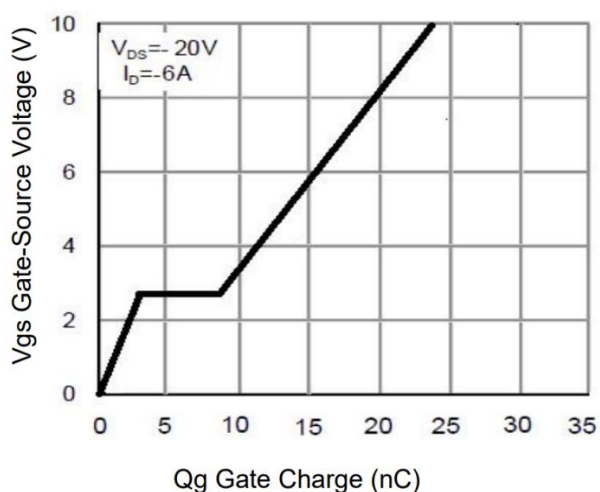


Figure 5 Gate Charge

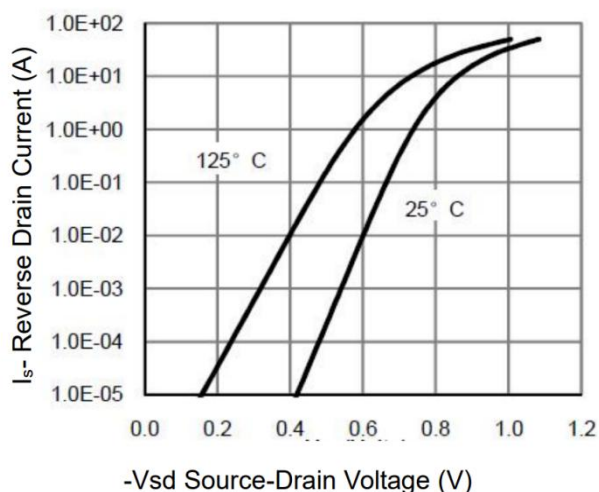


Figure 6 Source- Drain Diode Forward

Typical Characteristics

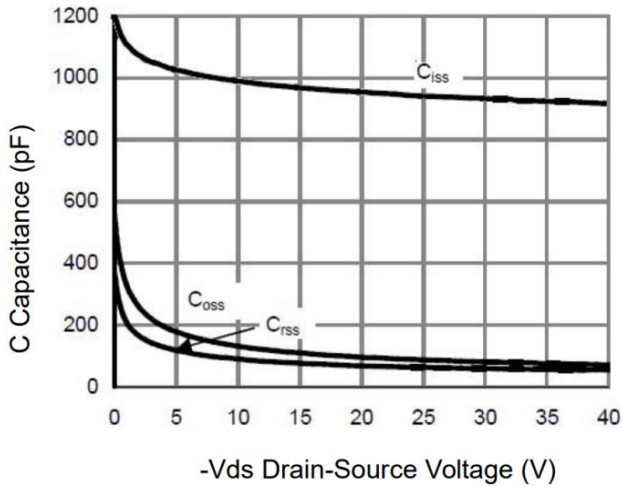


Figure 7 Capacitance vs Vds

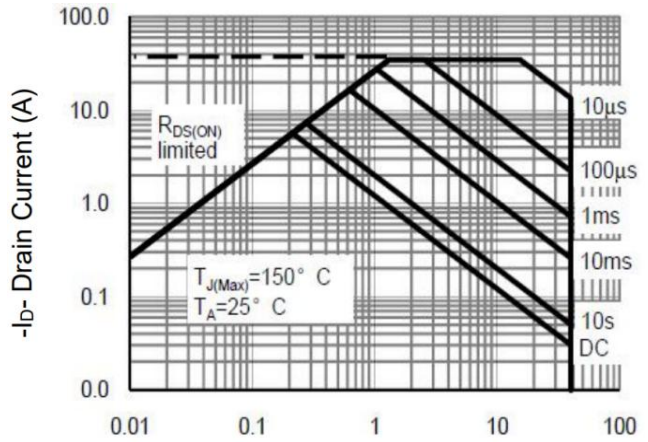


Figure 8 Safe Operation Area

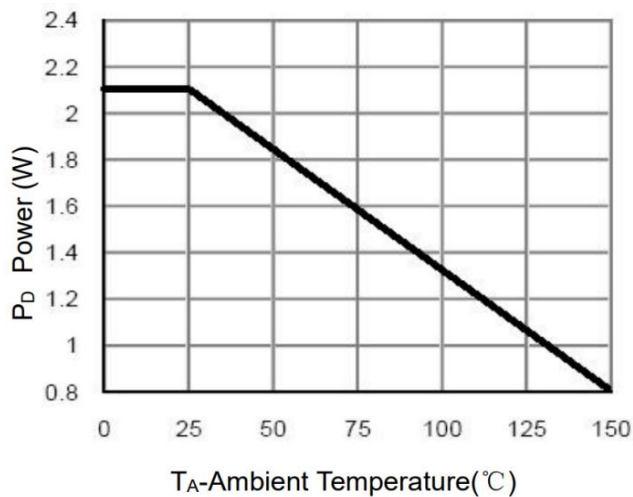


Figure 9 Power Dissipation

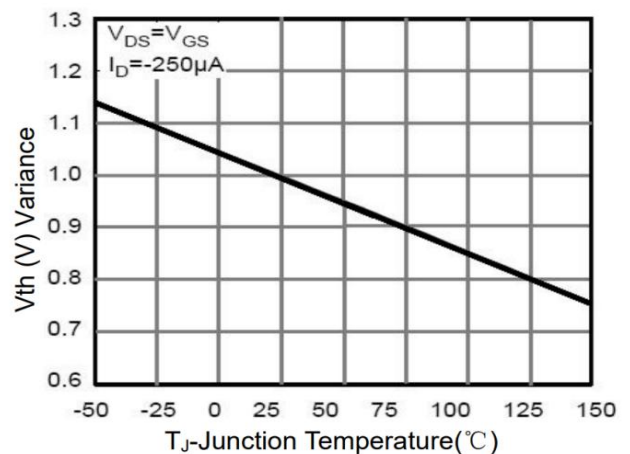


Figure 10 VGS(th) vs Junction Temperature

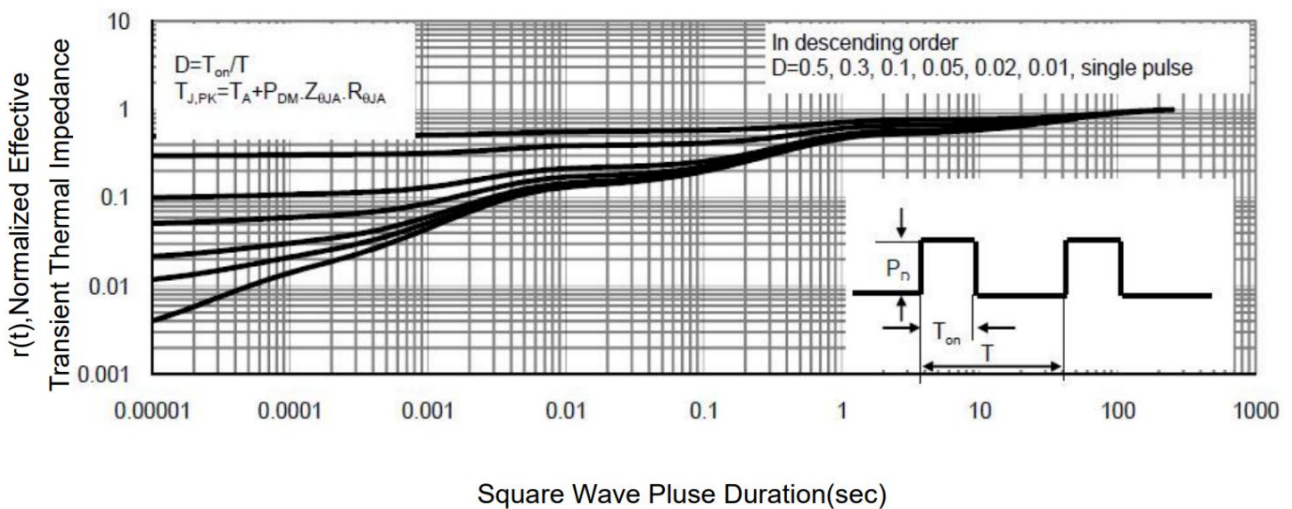
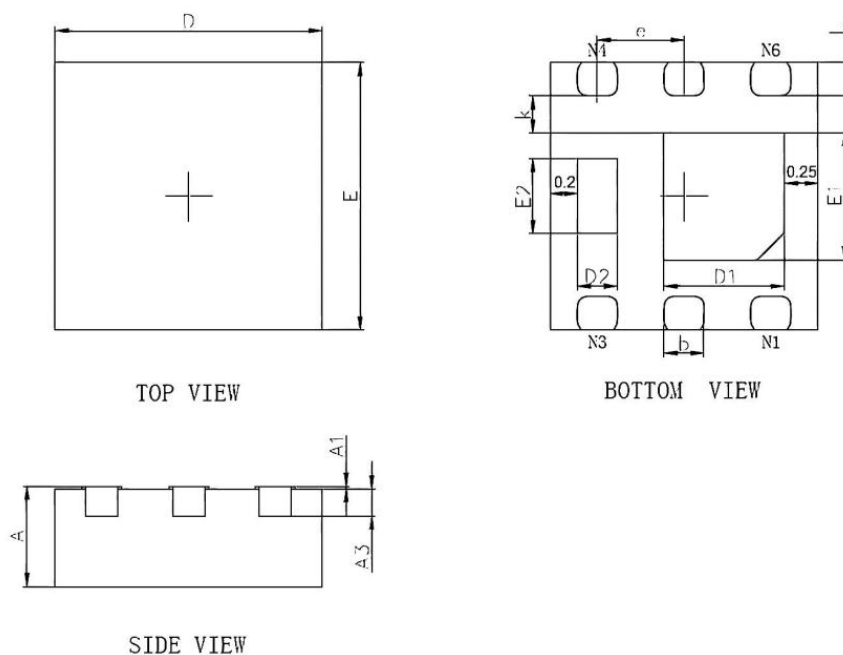


Figure 11 Normalized Maximum Transient Thermal Impedance

DFN2*2-6L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.000	0.050	0.000	0.002
A3	0.203 REF.		0.008 REF.	
D	1.924	2.076	0.076	0.082
E	1.924	2.076	0.076	0.082
D1	0.800	1.000	0.031	0.039
E1	0.850	1.050	0.033	0.041
D2	0.200	0.400	0.008	0.016
E2	0.460	0.660	0.018	0.026
k	0.200	-	0.008	-
b	0.250	0.350	0.010	0.014
e	0.650 TYP.		0.026 TYP.	
L	0.174	0.326	0.007	0.013