

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
30V	240mΩ@4.5V	1.4A
	300mΩ@2.5V	
	500mΩ@1.8V	

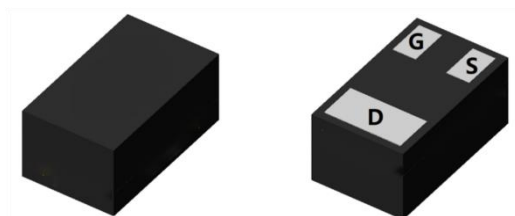
Feature

- Trench power MV MOSFET technology
- Voltage controlled small signal switch
- Low input capacitance
- Fast switching speed
- Suffix "-Q1" for AEC-Q101

Application

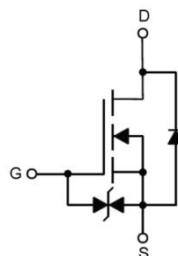
- Battery operated systems
- Solid-state relays
- Direct logic-level interface: TTL/CMOS

Package



DFN1006-3L

Circuit diagram



Marking



Absolute maximum ratings ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 10	V
Continuous Drain Current	I_D	1.4	A
Continuous Drain Current($T_A=100^{\circ}\text{C}$)	$I_D(100^{\circ}\text{C})$	0.9	A
Pulsed Drain Current ¹⁾	I_{DM}	5	A
Power Dissipation ²⁾	P_D	0.8	W
Thermal Resistance Junction to Ambient ³⁾	$R_{\theta JA}$	150	$^{\circ}\text{C}/\text{W}$
Operating Junction Temperature	T_J	$-55 \sim +150$	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	$-55 \sim +150$	$^{\circ}\text{C}$

Electrical characteristics ($T_J=25^{\circ}\text{C}$ 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	30			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =30V, V _{GS} =0V			1	μA
Gate-body leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±10V			±10	μA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.45	0.75	1	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =4.5V, I _D =1.4A		180	240	mΩ
		V _{GS} =2.5V, I _D =1.2A		225	300	
		V _{GS} =1.8V, I _D =1A		330	500	
Dynamic characteristics ⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, f =1MHz		60		pF
Output Capacitance	C _{oss}			11		
Reverse Transfer Capacitance	C _{rss}			4		
Total Gate Charge	Q _g	V _{DS} =15V, V _{GS} =10V, I _D =1.4A		2.4		nC
Gate-Source Charge	Q _{gs}			0.6		
Gate-Drain Charge	Q _{gd}			0.4		
Turn-on delay time	t _{d(on)}	V _{DS} =15V, V _{GS} =10V, I _D =1.4A R _G =3Ω		3		nS
Turn-on rise time	t _r			22		
Turn-off delay time	t _{d(off)}			4		
Turn-off fall time	t _f			21		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				1.4	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =1.4A			1.2	V
Reverse Recovery Charge	T _{rr}	I _F =1.4A, di/dt =50A/us			8.6	nS
Reverse Recovery Charge	Q _{rr}				0.6	nC

Notes:

- 1) Repetitive rating; pulse width limited by max. junction temperature.
- 2) P_D is based on max. junction temperature, using junction-case thermal resistance.
- 3) The value of $R_{\theta JA}$ is measured with the device mounted on 1 in² FR-4 board with 2oz. Copper, in the still air environment with $T_A=25^{\circ}\text{C}$. The maximum allowed junction temperature of 150°C . The value in any given application depends on the user's specific board design.
- 4) Guaranteed by design, not subject to production testing.

Typical Characteristics

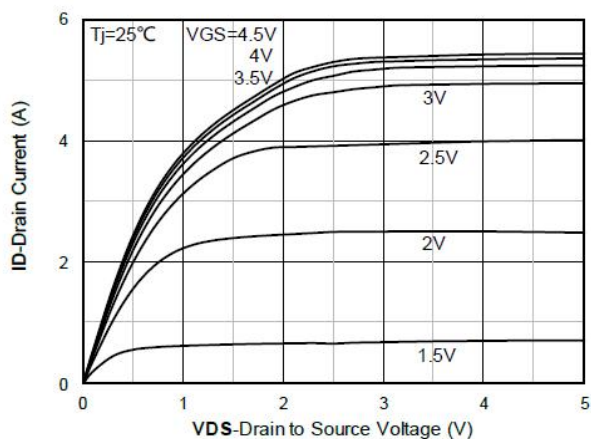


Figure 1. Output Characteristics

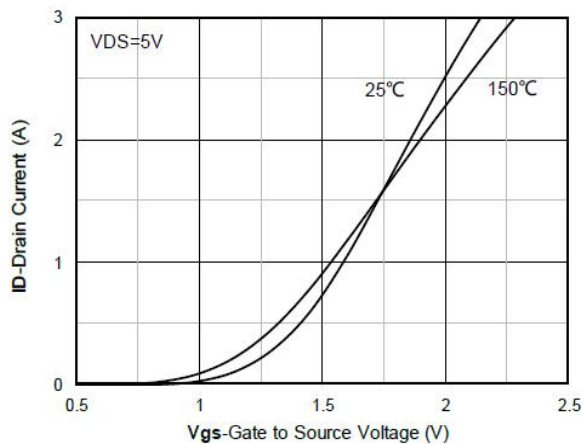


Figure 2. Transfer Characteristics

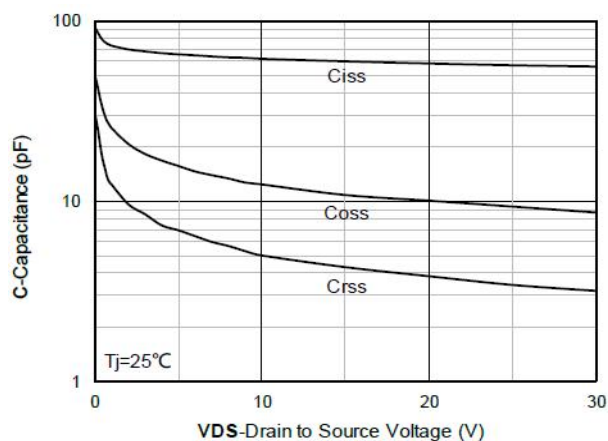


Figure 3. Capacitance Characteristics

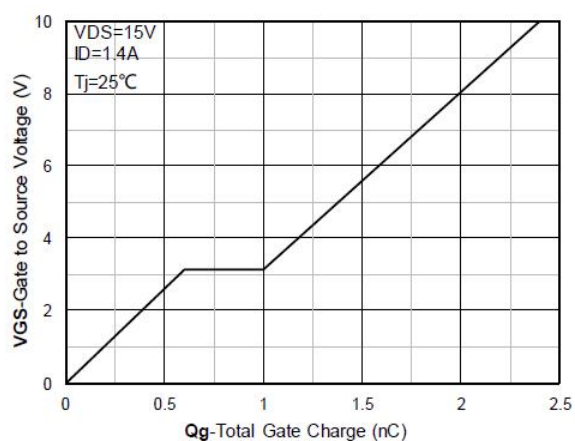


Figure 4. Gate Charge

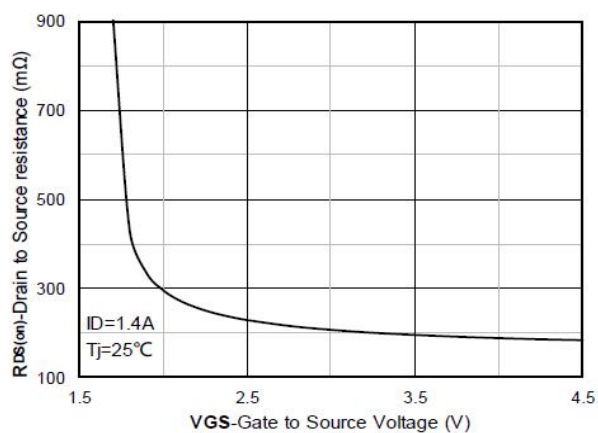


Figure 5. On-Resistance vs Gate to Source Voltage

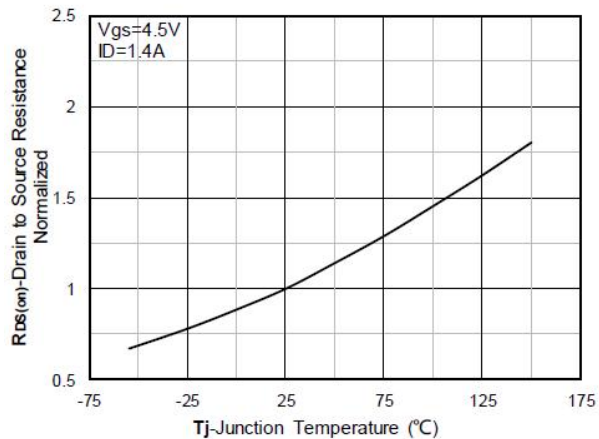


Figure 6. Normalized On-Resistance

Typical Characteristics

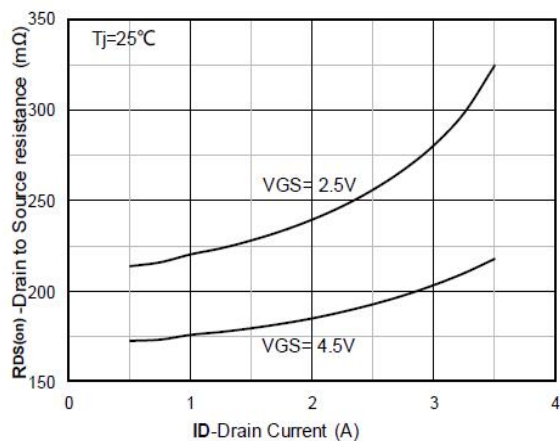


Figure 7. $R_{DS(on)}$ VS Drain Current

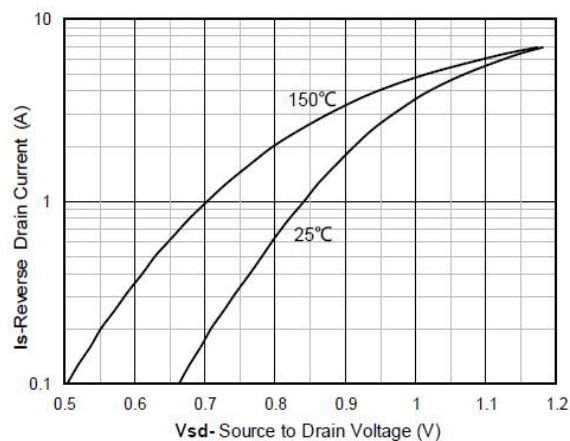


Figure 8. Forward characteristics of reverse diode

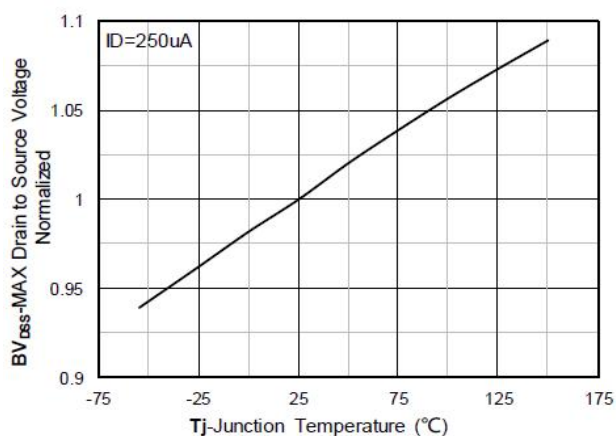


Figure 9. Normalized breakdown voltage

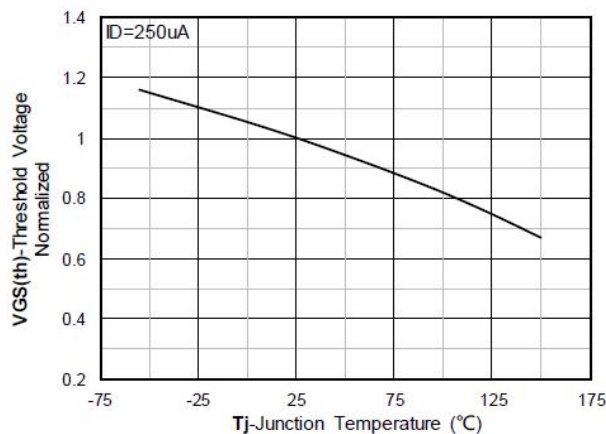


Figure 10. Normalized Threshold voltage

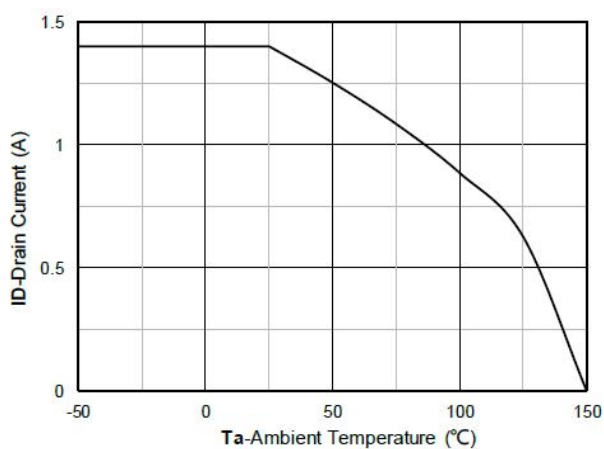


Figure 11. Current dissipation

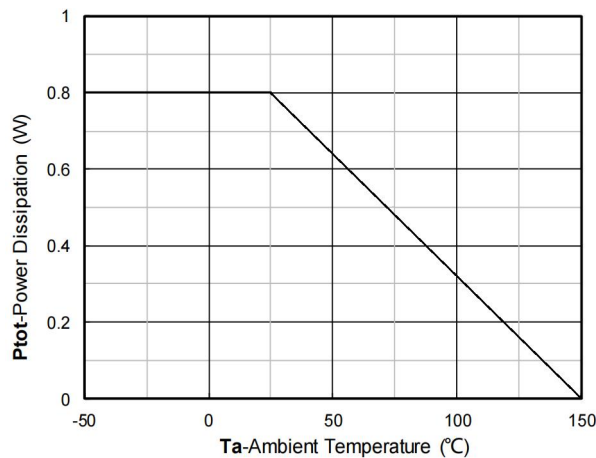


Figure 12. Power dissipation

Typical Characteristics

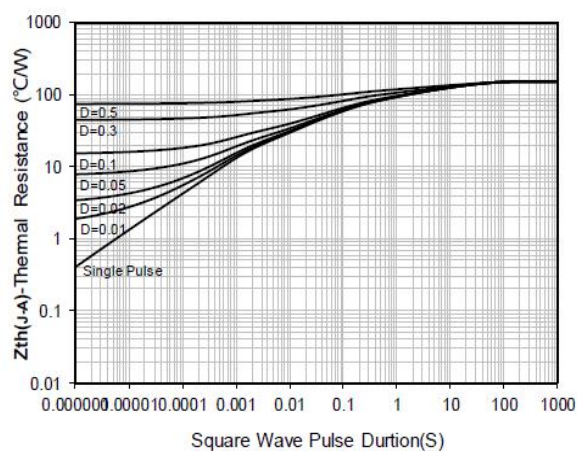


Figure 13. Maximum Transient Thermal Impedance

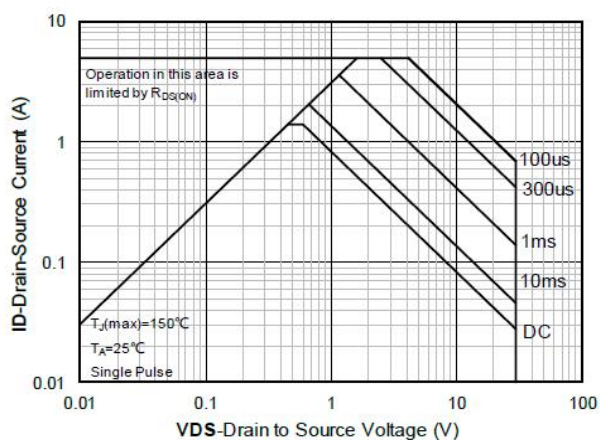
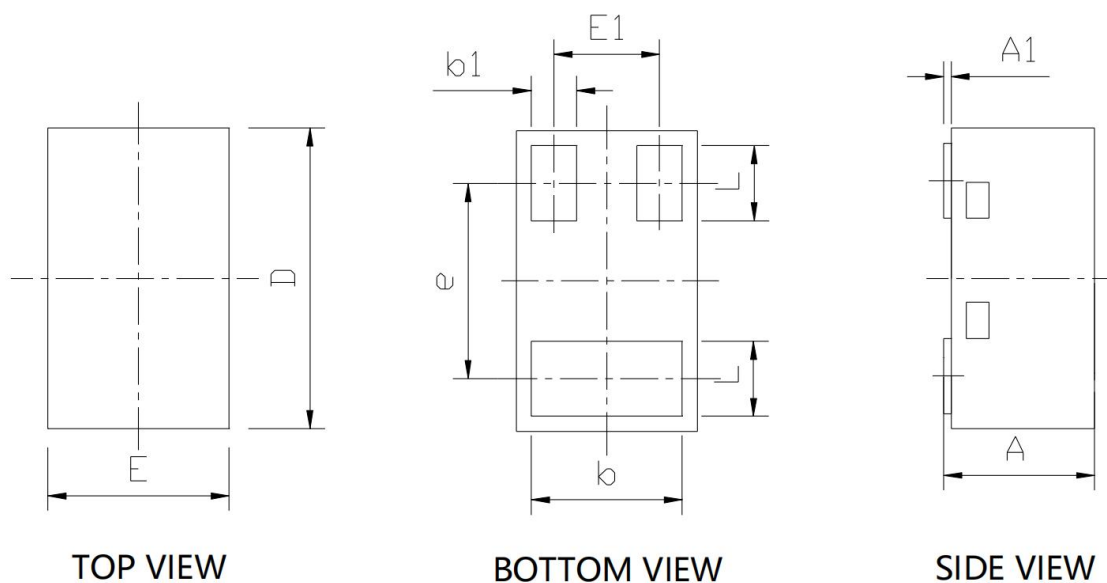


Figure 14. Safe Operation Area

DFN1006-3L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.420	0.550	0.017	0.022
A1	0.025 REF.		0.001 REF.	
b	0.450	0.550	0.018	0.022
b1	0.100	0.200	0.004	0.008
D	0.950	1.050	0.037	0.041
E	0.550	0.650	0.022	0.026
E1	0.350 BSC.		0.014 BSC.	
e	0.650 BSC.		0.026 BSC.	
L	0.200	0.300	0.008	0.012