

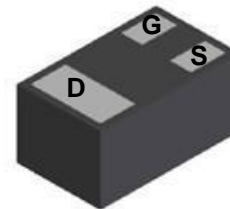
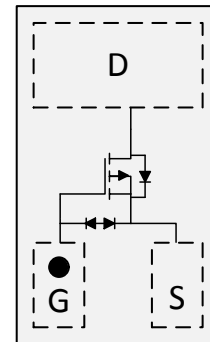
»Features

$V_{DS} = -20V$
 $I_D = -0.74A$
 $R_{DS(ON)} @V_{GS} = -4.5V, TYP = 230m\Omega$
 $R_{DS(ON)} @V_{GS} = -2.8V, TYP = 320m\Omega$
 $R_{DS(ON)} @V_{GS} = -2.5V, TYP = 355m\Omega$
 $R_{DS(ON)} @V_{GS} = -1.8V, TYP = 650m\Omega$

»General Description

- Advanced trench process technology
- High Density Cell Design For Ultra Low On-Resistance
- DFN1006-3L for Surface Mount Package
- DC-DC converter circuit
- Power Switch

»Pin Configurations



DFN1006-3L

»Absolute Maximum Ratings

Parameter		Symbol	10 S	Steady State	Unit
Drain-Source Voltage		V_{DS}	-20		V
Gate-Source Voltage		V_{GS}	± 10		
Continuous Drain Current ^a	$T_A=25^\circ C$	I_D	-0.74	-0.69	A
	$T_A=70^\circ C$		-0.59	-0.55	
Maximum Power Dissipation ^a	$T_A=25^\circ C$	P_D	0.32	0.27	W
	$T_A=70^\circ C$		0.20	0.18	
Continuous Drain Current ^b	$T_A=25^\circ C$	I_D	-0.70	-0.65	A
	$T_A=70^\circ C$		-0.56	-0.52	
Maximum Power Dissipation ^b	$T_A=25^\circ C$	P_D	0.28	0.25	W
	$T_A=70^\circ C$		0.18	0.16	
Pulsed Drain Current ^c		I_{DM}	-1.5		A
Operating Junction Temperature		T_J	-55 to 150		$^\circ C$
Lead Temperature		T_L	260		$^\circ C$
Storage Temperature Range		T_{stg}	-55 to 150		$^\circ C$

» Thermal resistance ratings

Parameter	Symbol	Typical	Maximum	Unit	
Junction-to-Ambient Thermal Resistance ^a	t ≤ 10 s	340	395	°C/W	
	Steady State	390	455		
Junction-to-Ambient Thermal Resistance ^b	t ≤ 10 s	387	441		
	Steady State	445	505		
Junction-to-Case Thermal Resistance	Steady State	R _{θJC}	240		285

a Surface mounted on FR4 Board using 1 square inch pad size, 1oz copper

b Surface mounted on FR4 board using minimum pad size, 1oz copper

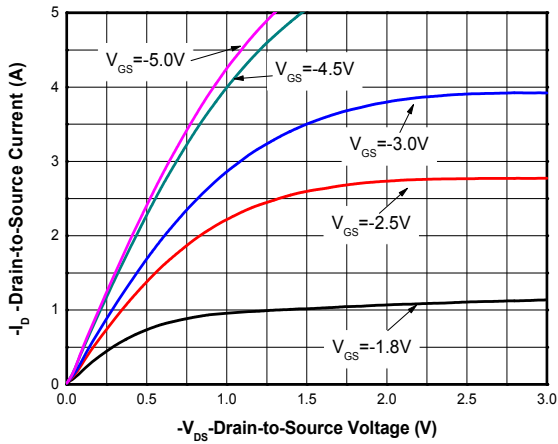
c Repetitive rating, pulse width limited by junction temperature, t_p=10μs, Duty Cycle=1%

d Repetitive rating, pulse width limited by junction temperature T_J=150°C.

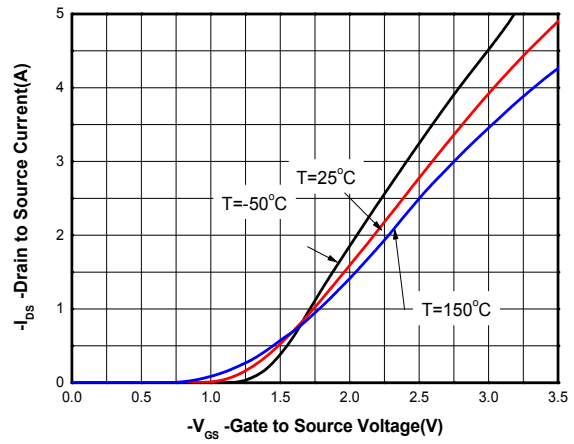
» Electrical Characteristics @T_A=25°C unless otherwise noted

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0 V, I _D = -250uA	-20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -16 V, V _{GS} = 0V			-1	uA
Gate-to-source Leakage Current	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±10V			±5	uA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} = V _{DS} , I _D = -250uA	-0.45	-0.7	-1.0	V
Drain-to-source On-resistance	R _{DS(on)}	V _{GS} = -4.5V, I _D = -1.4A		230	390	mΩ
		V _{GS} = -2.8V, I _D = -0.8A		320	480	
		V _{GS} = -2.5V, I _D = -0.6A		355	620	
		V _{GS} = -1.8V, I _D = -0.5A		650	790	
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C _{ISS}	V _{GS} = 0 V, f = 1.0 MHz, V _{DS} = -15 V		104		pF
Output Capacitance	C _{OSS}			25		
Reverse Transfer Capacitance	C _{RSS}			19		
Total Gate Charge	Q _{G(TOT)}	V _{GS} = -4.5 V, V _{DS} = -10 V, I _D = -1A		1.1		nC
Threshold Gate Charge	Q _{G(TH)}			0.25		
Gate-to-Source Charge	Q _{GS}			0.38		
Gate-to-Drain Charge	Q _{GD}			0.47		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	td(ON)	V _{GS} = -4.5 V, V _{DS} = -10 V, R _G =6 Ω, I _D =-1A		7.2		ns
Rise Time	tr			7.5		
Turn-Off Delay Time	td(OFF)			18.5		
Fall Time	tf			10.7		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V _{SD}	V _{GS} = 0 V, I _S = -0.5A	-0.5	-0.8	-1.2	V

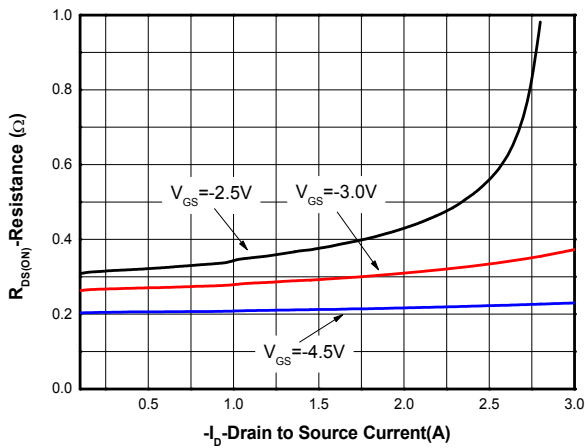
»Typical Performance Characteristics ((T_J = 25 °C, unless otherwise noted))



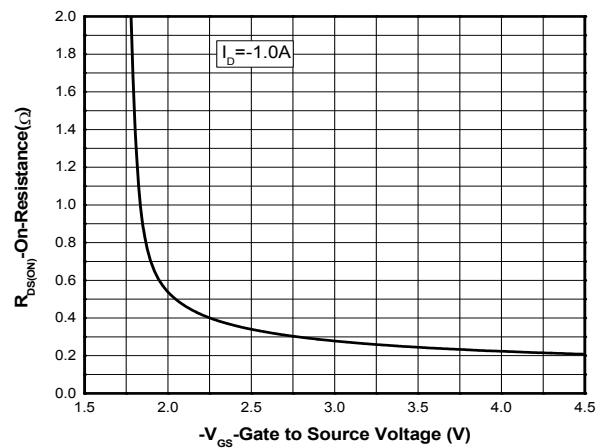
Output characteristics



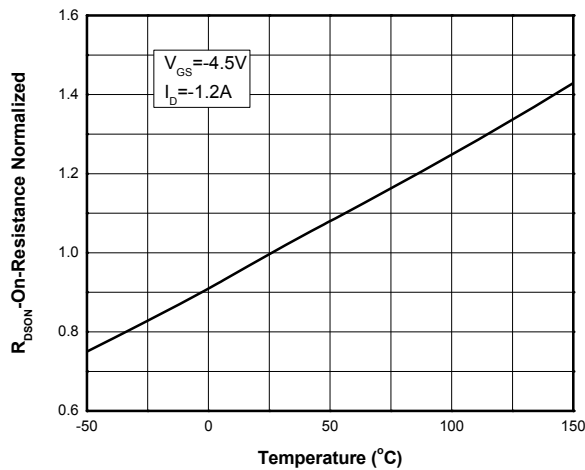
Transfer characteristics



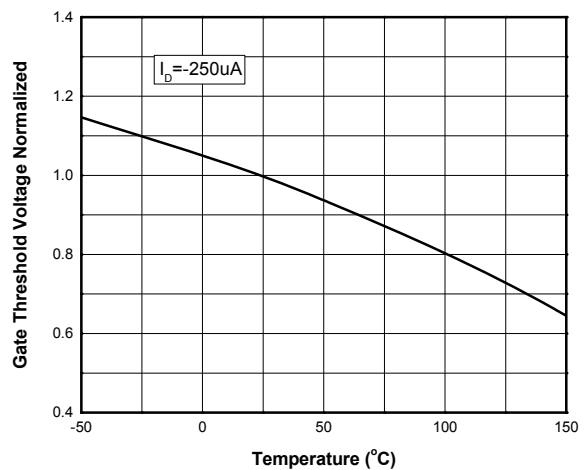
On-Resistance vs. Drain current



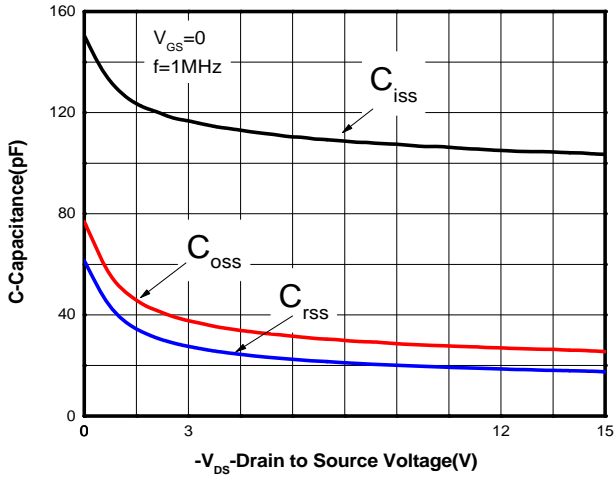
On-Resistance vs. Gate-to-Source voltage



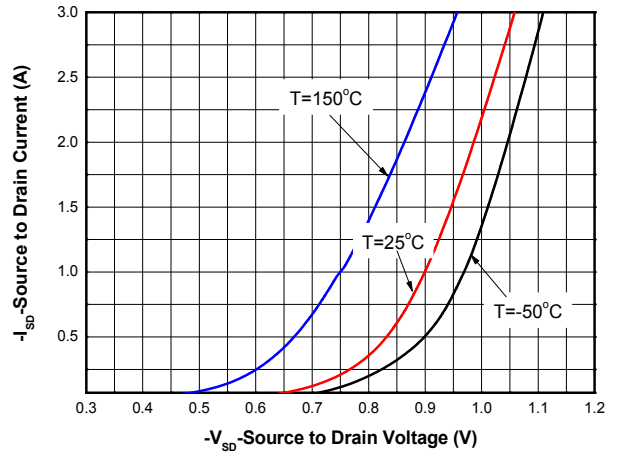
On-Resistance vs. Junction temperature



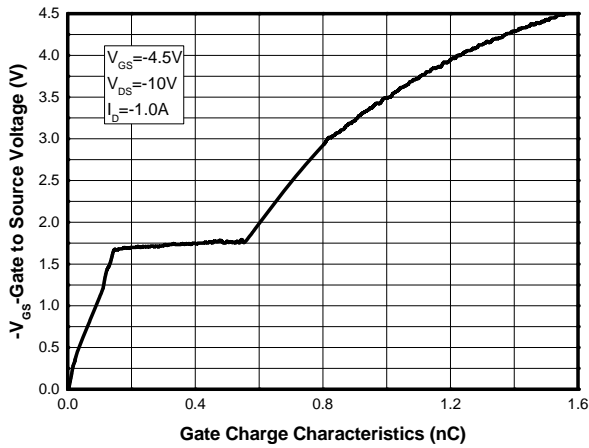
Threshold voltage vs. Temperature



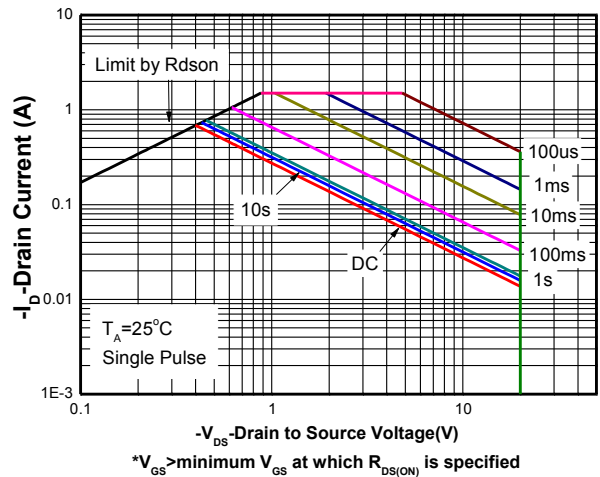
Capacitance



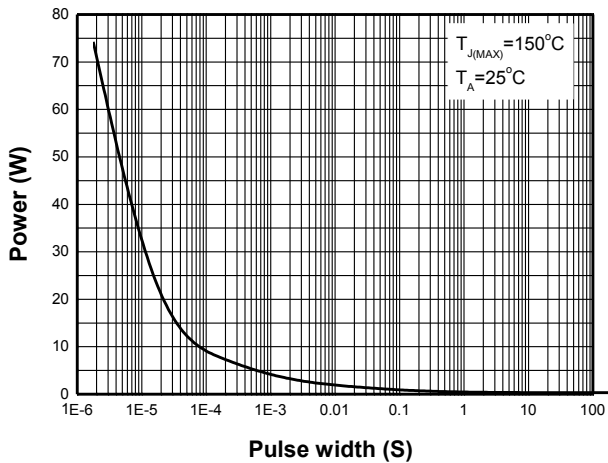
Body diode forward voltage



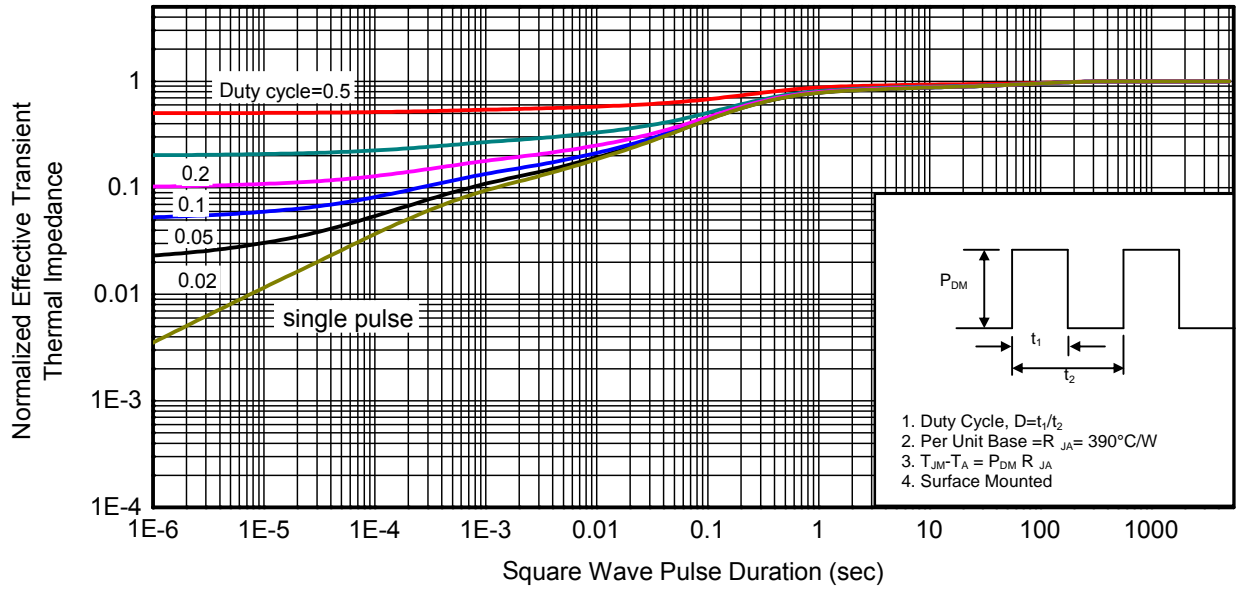
Gate Charge Characteristics



Safe operating power



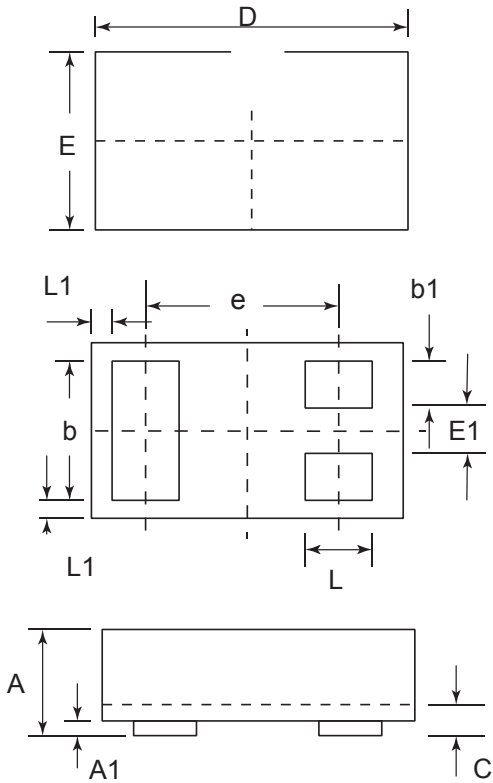
Single pulse power



Transient thermal response (Junction-to-Ambient)

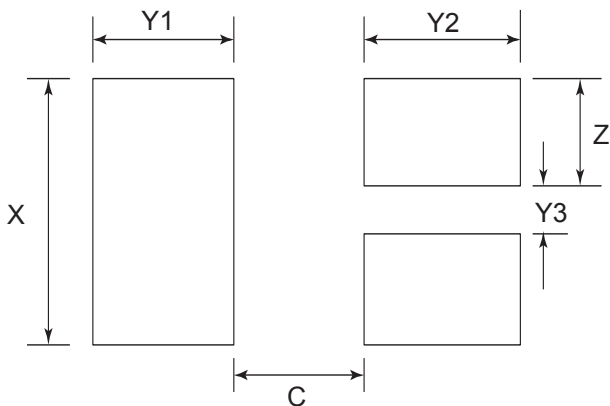
»Package Information

DFN1006-3L



SYM	DIMENSIONS		
	MILLIMETERS		
	MIN	NOM	MAX
A	0.45	0.50	0.55
A1	0.00	0.02	0.05
b	0.45	0.50	0.55
b1	0.10	0.15	0.20
C	0.12	0.15	0.18
D	0.95	1.00	1.05
e	0.65 BSC		
E	0.55	0.60	0.65
E1	0.15	0.20	0.25
L	0.20	0.25	0.30
L1	0.05REF		

Suggested Land Pattern:



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
C	0.25	0.010
X	0.65	0.024
Y1	0.50	0.020
Y2	0.50	0.020
Y3	0.25	0.010
Z	0.20	0.008

»Ordering information

Order code	Package	Marking	Base qty	Delivery mode
BMDFN2301	DFN1006-3L	M2301	10K	Tape and reel