BMDFN2301

P-Channel MOSFET

»Features

V_{DS} = -20V

I_D = -0.74A

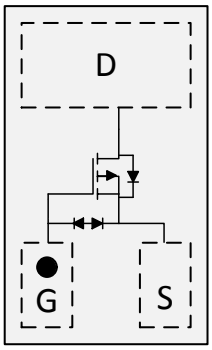
$R_{DS(ON)}$ @V_{GS} = -4.5V, TYP =230mΩ

$R_{DS(ON)}$ @V_{GS} = -2.8V, TYP =320mΩ

$R_{DS(ON)}$ @V_{GS} = -2.5V, TYP =355mΩ

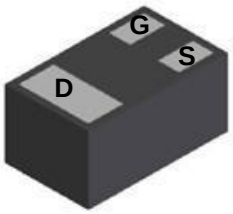
$R_{DS(ON)}$ @V_{GS} = -1.8V, TYP =650mΩ

»Pin Configurations



»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



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°C	I_D	-0.74	-0.69	A
	T_A=70°C		-0.59	-0.55	
Maximum Power Dissipation [a]	T_A=25°C	P_D	0.32	0.27	W
	T_A=70°C		0.20	0.18	
Continuous Drain Current [b]	T_A=25°C	I_D	-0.70	-0.65	A
	T_A=70°C		-0.56	-0.52	
Maximum Power Dissipation [b]	T_A=25°C	P_D	0.28	0.25	W
	T_A=70°C		0.18	0.16	
Pulsed Drain Current [c]		I_{DM}	-1.5		A
Operating Junction Temperature		T_J	-55 to 150		°C
Lead Temperature		T_L	260		°C
Storage Temperature Range		T_{stg}	-55 to 150		°C

» Thermal resistance ratings

Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance [a]	t ≤ 10 s	$R_{\theta JA}$	340	395	°C/W
	Steady State		390	455	
Junction-to-Ambient Thermal Resistance [b]	t ≤ 10 s	$R_{\theta JA}$	387	441	
	Steady State		445	505	
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	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

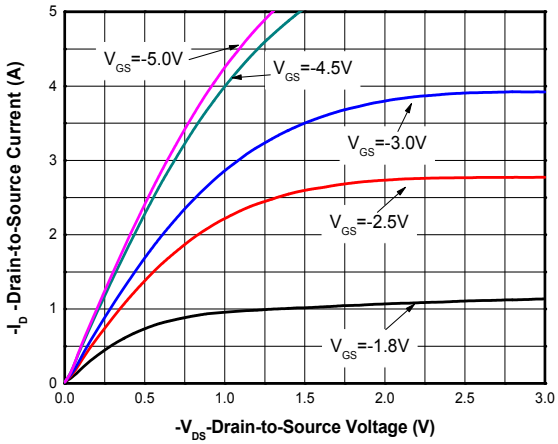
c Repetitive rating, pulse width limited by junction temperature, t_p=10μs, Duty Cycle=1%

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

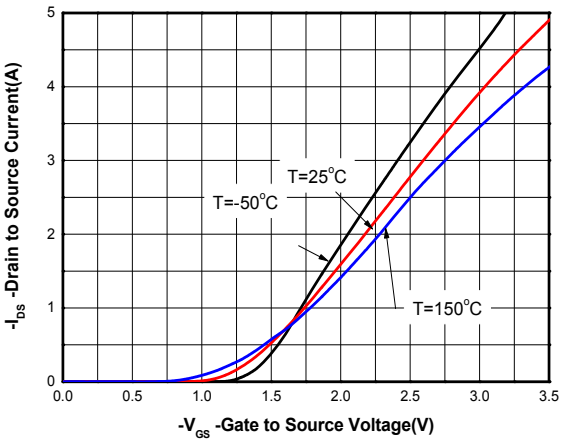
»Electrical Characteristics @T_A=25℃ unless otherwise noted

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,ID=-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

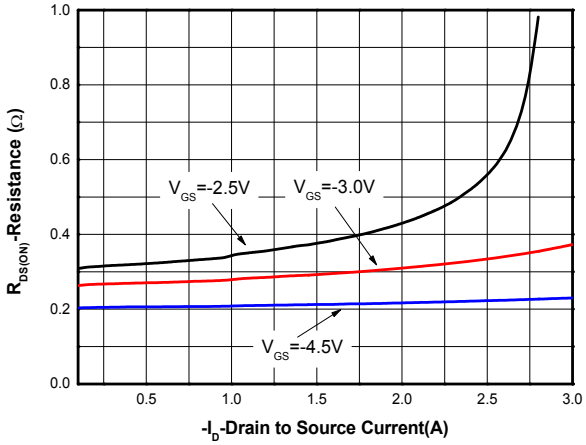
»Typical Performance Characteristics ((TJ = 25 °C, unless otherwise noted))



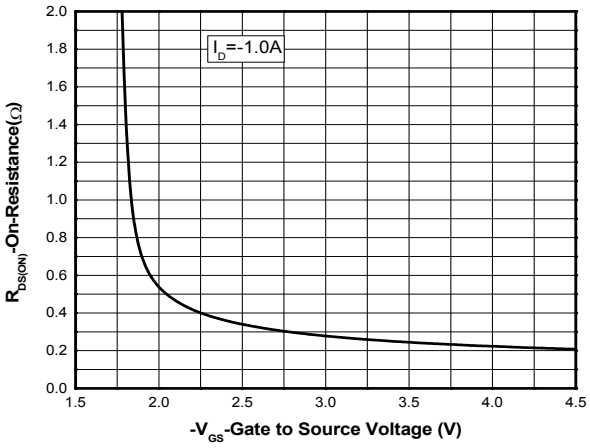
Output characteristics



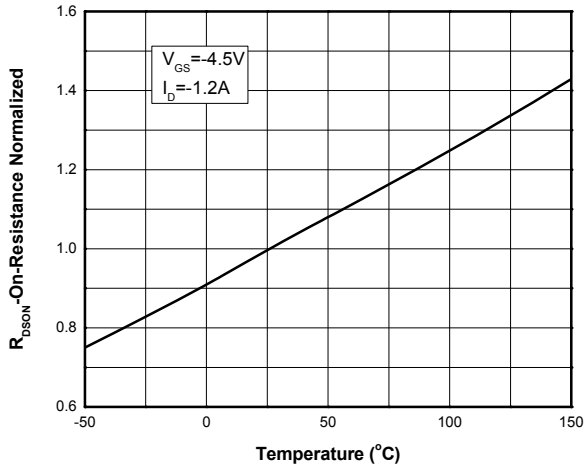
Transfer characteristics



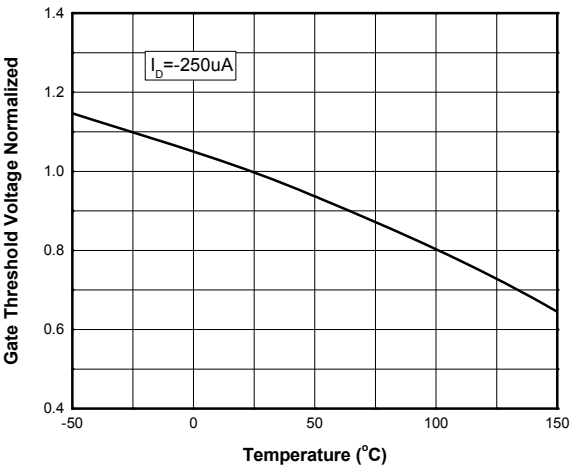
On-Resistance vs. Drain current



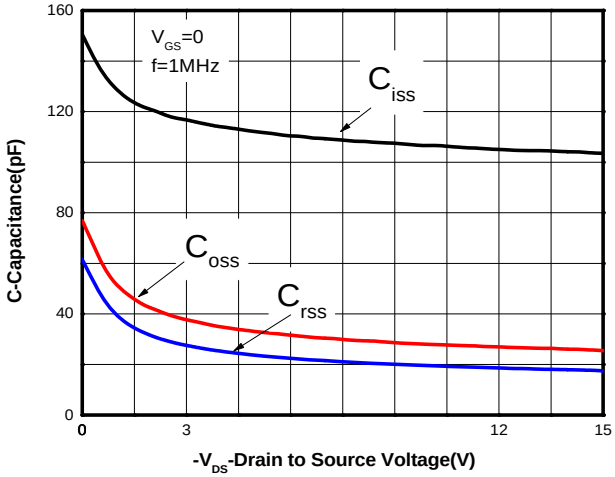
On-Resistance vs. Gate-to-Source voltage



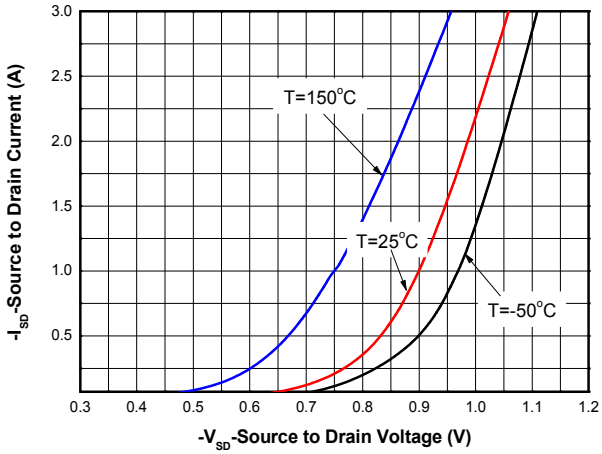
On-Resistance vs. Junction temperature



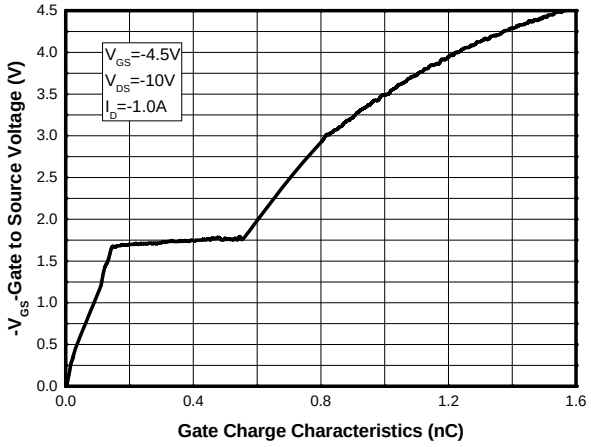
Threshold voltage vs. Temperature



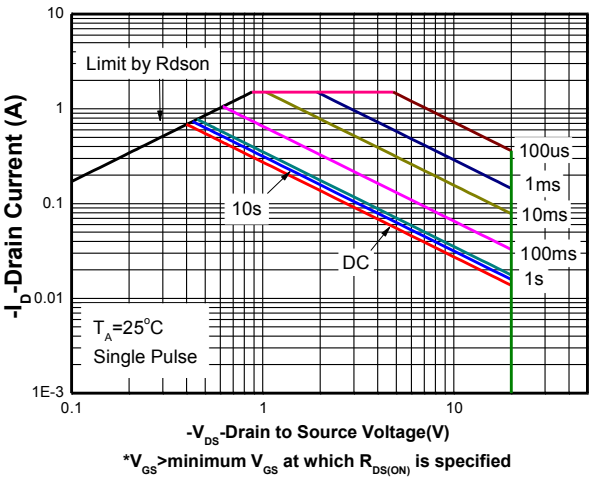
Capacitance



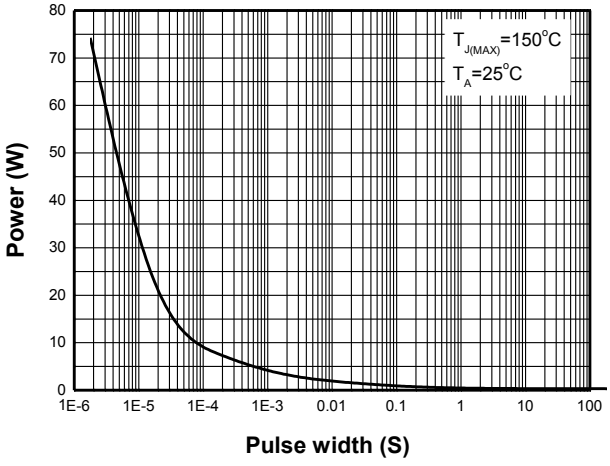
Body diode forward voltage



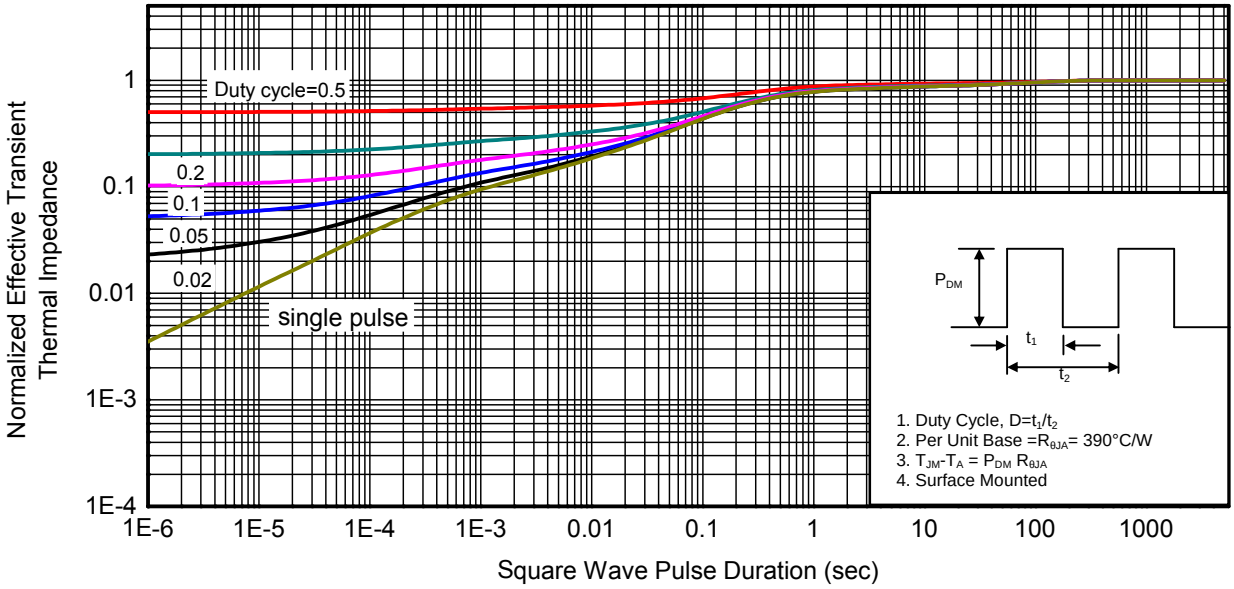
Gate Charge Characteristics



Safe operating power



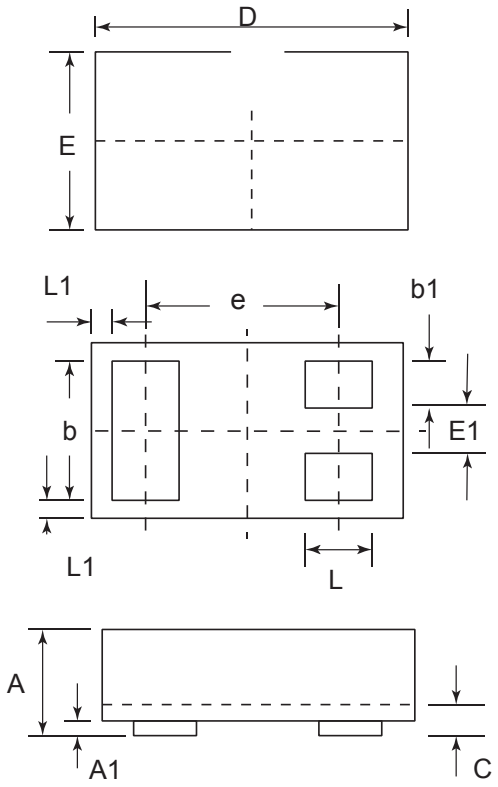
Single pulse power



Transient thermal response (Junction-to-Ambient)

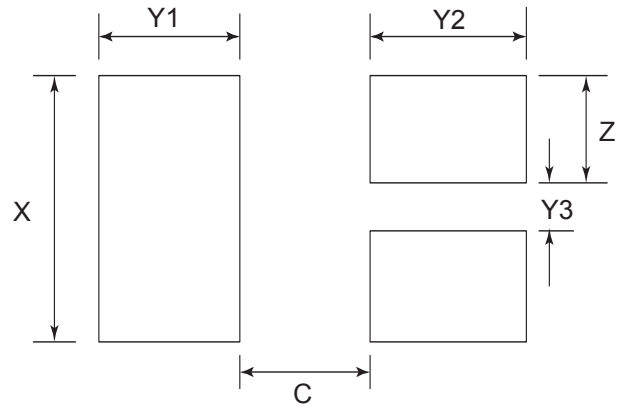
»Package Information

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	Deliverymode
BMDFN2301	DFN1006-3L	M2301	10K	Tape andreel

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