

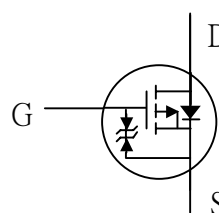
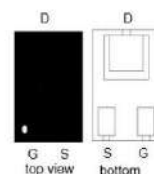
N-Channel MOSFET

FEATURES

- Fast switching speed
- Reliable and Rugged
- ROHS Compliant & Halogen-Free
- ESD Protection

PRODUCT SUMMARY		
V_{DS}	I_D	$R_{DS(on)}$ (m Ω) Max
30	0.5A	420 @ $V_{GS}=4.5V$
	0.3A	565 @ $V_{GS}=2.5V$
	0.1A	850 @ $V_{GS}=1.8V$

FBP1006 (TOP view)



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 12	V
Drain Current-Continuous	$T_A=25^\circ\text{C}$	I_D	1	A
	$T_A=70^\circ\text{C}$		0.8	A
Drain Current-Continuous ¹		I_{DM}	2.5	A
Avalanche Energy, Single pulse ²	$L=0.1\text{mH}$	E_{AS}	0.16	mJ
Avalanche Current, Single pulse ²	$L=0.1\text{mH}$	I_{AS}	1.8	A
Maximum Power Dissipation	$T_A=25^\circ\text{C}$	P_D	0.69	W
	$T_A=70^\circ\text{C}$	P_D	0.44	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	- 55 to 150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Thermal Resistance, Junction to Case ³	R_{thJA}	180	$^\circ\text{C/W}$
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ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ ^c	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V , I _D = 250uA	30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 24V , V _{GS} = 0V			1.0	uA
Gate-Body Leakage	I _{GSS}	V _{GS} = ±12V , V _{DS} = 0V			±10	uA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250uA	0.6	0.95	1.3	V
Drain-Source On-State Resistance ⁴	R _{DS(on)}	V _{GS} = 4.5V , I _D = 0.5A		350	420	mΩ
		V _{GS} = 2.5V , I _D = 0.3A		435	565	mΩ
		V _{GS} = 1.8V , I _D = 0.1A		740	850	mΩ
DYNAMIC CHARACTERISTICS ⁵						
Input Capacitance	C _{ISS}	V _{DS} = 15V , V _{GS} = 0V f = 1.0MHz		38.1		pF
Output Capacitance	C _{OSS}			4.8		pF
Reverse Transfer Capacitance	C _{RSS}			3.4		pF
Total Gate Charge	Q _g	V _{GS} = 4.5V V _{DS} = 15V, I _D = 1A		0.85		nC
Gate-Source Charge	Q _{gs}			0.29		nC
Gate-Drain Charge	Q _{gd}			0.16		nC
SWITCHING CHARACTERISTICS ⁵						
Turn-On Delay Time	t _{D(ON)}	V _{GS} = 4.5V, V _{DD} = 15V I _D = 1A, R _{GEN} = 6Ω		5.3		ns
Rise Time	t _r			20.2		ns
Turn-Off Delay Time	t _{D(OFF)}			34.5		ns
Fall Time	t _f			30.3		ns
Drain-Source Diode Characteristics and Max Ratings						
Drain to Source Diode Forward Current	I _S				0.6	A
Drain to Source Diode Forward Voltage	V _{SD}	V _{GS} = 0V, I _S = 0.25A		0.9	1.1	V
Body Diode Reverse Recovery Time	t _{rr}	I _F =0.25A, di/dt = 100A/us VR=20V		24.1		nS
Body Diode Reverse Recovery Charge	Q _{rr}			3.2		nC

Notes: 1. Max. current is limited by junction temperature.

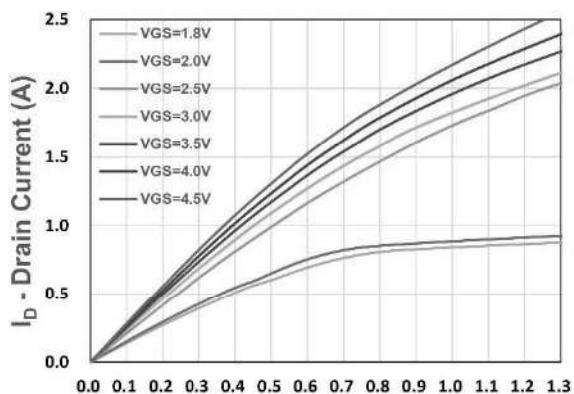
2. UIS tested and pulse width are limited by maximum junction temperature 150°C

3. Surface Mounted on 1in2 FR-4 board with 1oz

4. Pulse test (pulse width 300us, duty cycle 2%)

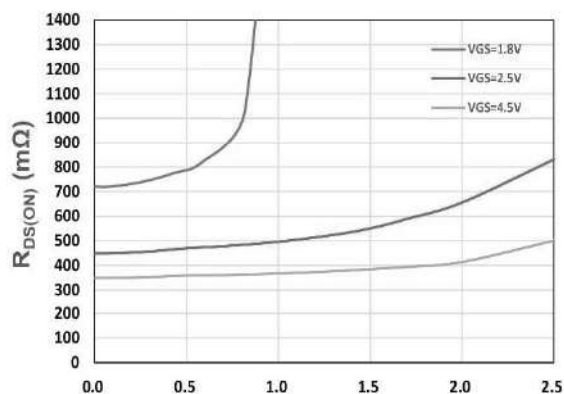
5. Guaranteed by design, not subject to production testing

Typical Performance Characteristics



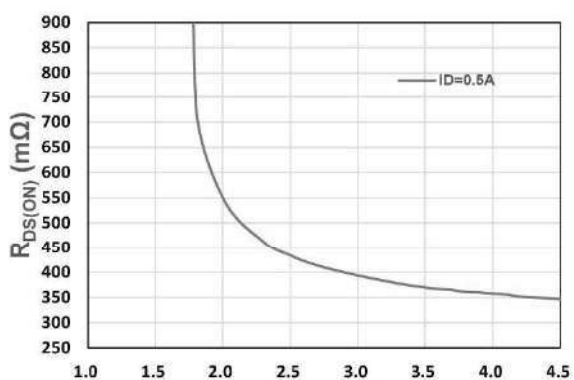
V_{DS} - Drain - Source Voltage (V)

Figure 1. Output Characteristics



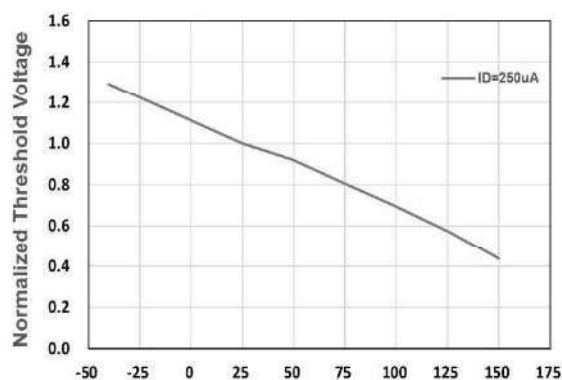
I_D - Drain Current (A)

Figure 2. On-Resistance vs. I_D



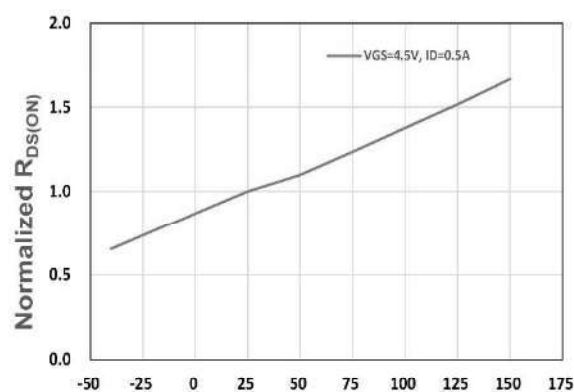
V_{GS} - Gate - Source Voltage (V)

Figure 3. On-Resistance vs. V_{GS}



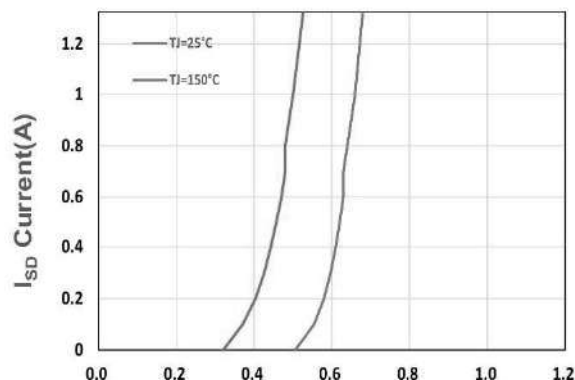
T_J , Junction Temperature(°C)

Figure 4. Gate Threshold Voltage



T_J , Junction Temperature(°C)

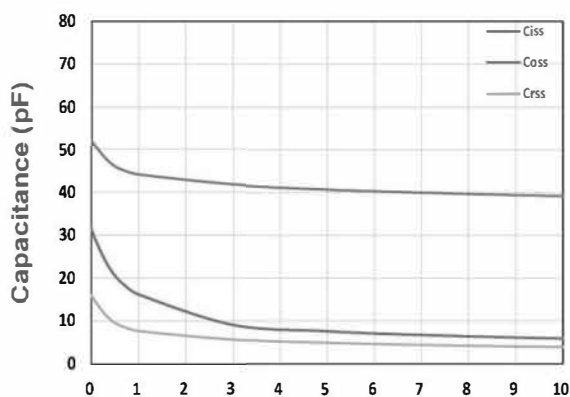
Figure 5. Drain-Source On Resistance



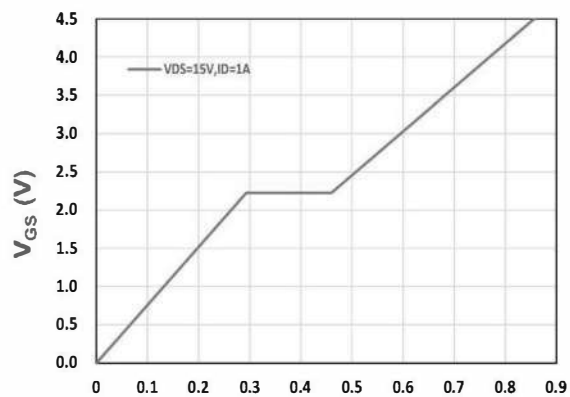
V_{SD} , Source-Drain Voltage(V)

Figure 6. Source-Drain Diode Forward

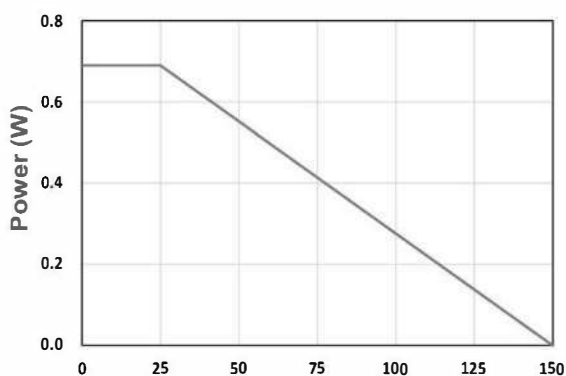
Typical Performance Characteristics



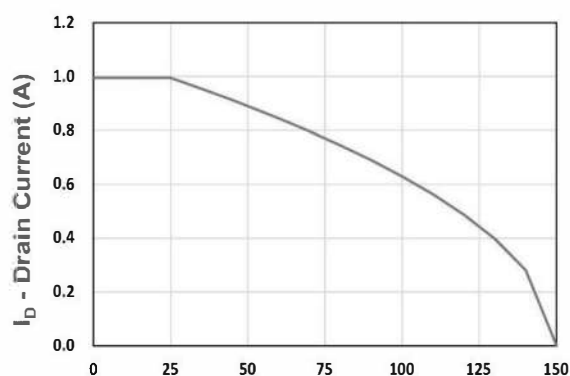
V_{DS} - Drain - Source Voltage (V)
Figure 7. Capacitance



Q_g , Total Gate Charge (nC)
Figure 8. Gate Charge Characteristics



T_A - Ambient Temperature (°C)
Figure 9. Power Dissipation



T_A - Ambient Temperature (°C)
Figure 10. Drain Current

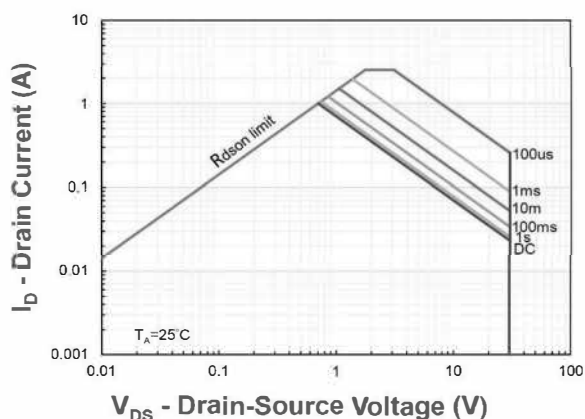


Figure 11. Safe Operating Area

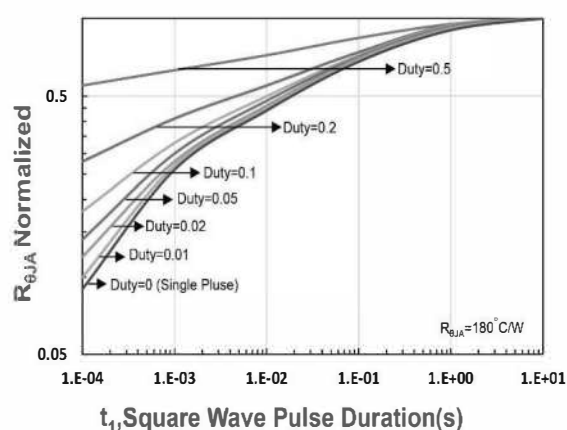


Figure 12. $R_{\theta JA}$ Transient Thermal Impedance