N-Channel Enhancement Mode MOSFET

Features

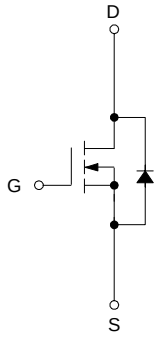
- +30V / 4A , N-MOSFET
  $R_{DS(ON)}$=30mΩ(typ.) @ V_{GS}=10V
  $R_{DS(ON)}$=50mΩ(typ.) @ V_{GS}=4.5V
- Super High Dense Cell Design
- Reliable and Rugged
- Lead Free Available (RoHS Compliant)

Applications

- Power Management in Notebook Computer, Portable Equipment and Battery Powered Systems.

Pin Description

Top View of SOT-23



N-Channel MOSFET

Ordering and Marking Information

BM3406 □□-□□ □

- Lead Free Code
- Handling Code
- Temp. Range
- Package Code

Package Code
A : SOT-23
Operating Junction Temp. Range
C : -55 to 150°C
Handling Code
TU : Tube TR : Tape & Reel
Lead Free Code
L : Lead Free Device Blank : Original Device

Absolute Maximum Ratings (T_A = 25°C unless otherwise noted)

Symbol	Parameter		Rating	Unit
V_{DSS}	Drain-Source Voltage		30	V
V_{GSS}	Gate-Source Voltage		±20	
I_D*	Continuous Drain Current	V_{GS}=10V	4.0	A
I_{DM}*	300μs Pulsed Drain Current		12	
I_S*	Diode Continuous Forward Current		1.3	A
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	
P_D*	Maximum Power Dissipation	T_A=25°C	0.83	W
		T_A=100°C	0.3	
$R_{\theta JA}$*	Thermal Resistance-Junction to Ambient		150	°C/W

Note:

*Surface Mounted on 1in^2 pad area, t ≤ 10sec.

Electrical Characteristics (T_A = 25°C unless otherwise noted)

Symbol	Parameter	Test Condition	BM3406			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	30			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=24V, V_{GS}=0V			1	μA
		T_J=85°C			30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	1	1.5	2	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V			±100	nA
$R_{DS(ON)}$ [a]	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=4A		30	45	mΩ
		V_{GS}=4.5V, I_{DS}=2.8A			55	
V_{SD} [a]	Diode Forward Voltage	I_{SD}=1.25A, V_{GS}=0V		0.8	1.3	V
Gate Charge Characteristics [b]						
Q_g	Total Gate Charge	V_{DS}=15V, V_{GS}=10V, I_{DS}=4A		12.5	16	nC
Q_{gs}	Gate-Source Charge			2.4		
Q_{gd}	Gate-Drain Charge			1.3		

Electrical Characteristics (Cont.) (T_A = 25°C unless otherwise noted)

Symbol	Parameter	Test Condition	BM3406			Unit
			Min.	Typ.	Max.	
Dynamic Characteristics [b]						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz		1.5		Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=25V, Frequency=1.0MHz		400		pF
C_{oss}	Output Capacitance			80		
C_{rss}	Reverse Transfer Capacitance			45		
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=15V, R_L=15Ω, I_{DS}=1A, V_{GEN}=10V, R_G=6Ω		10	19	ns
T_r	Turn-on Rise Time			8	15	
$t_{d(OFF)}$	Turn-off Delay Time			19	35	
T_f	Turn-off Fall Time			6.2	12	

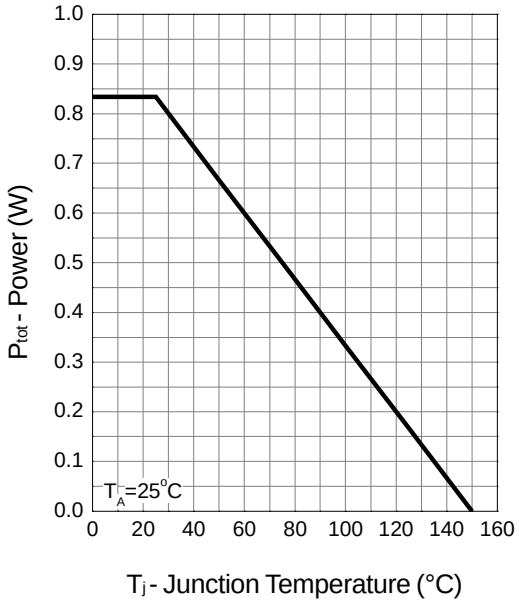
Notes:

a : Pulse test ; pulse width≤300μs, duty cycle≤2%.

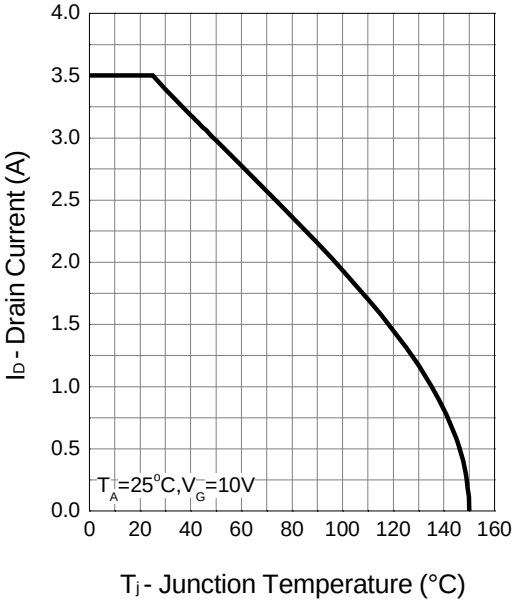
b : Guaranteed by design, not subject to production testing.

Typical Characteristics

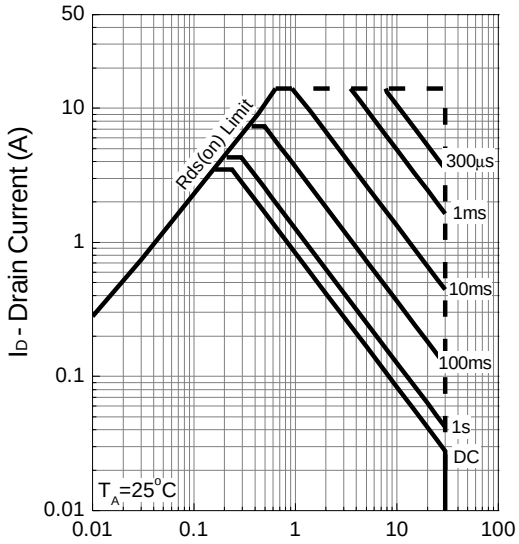
Power Dissipation



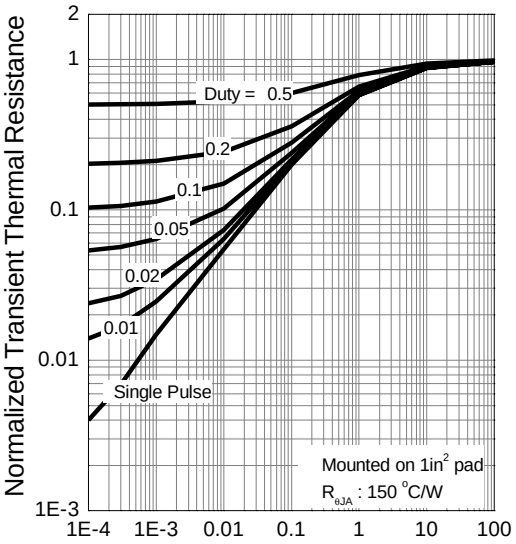
Drain Current



Safe Operation Area

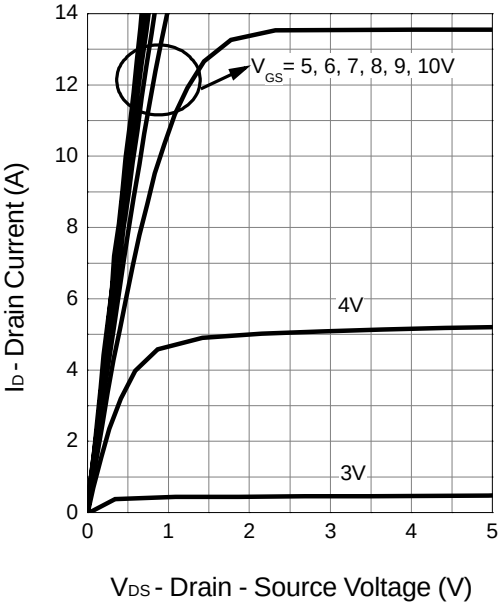


Thermal Transient Impedance

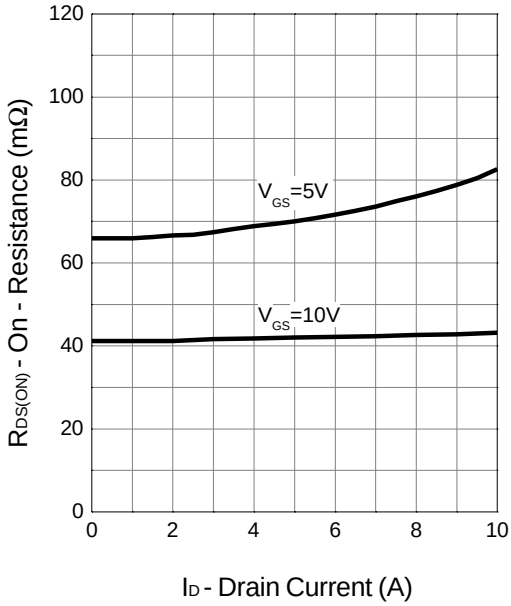


Typical Characteristics (Cont.)

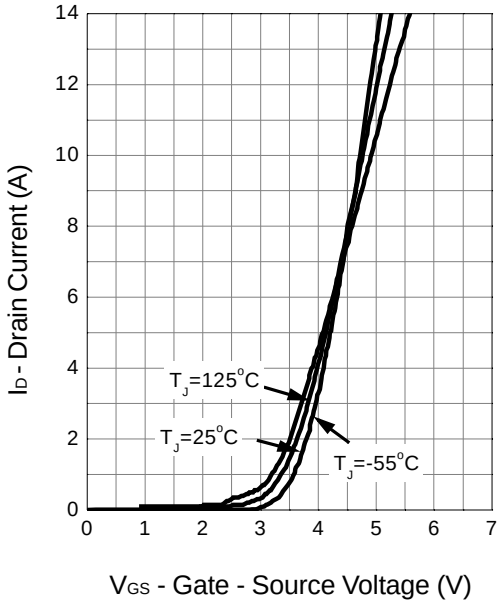
Output Characteristics



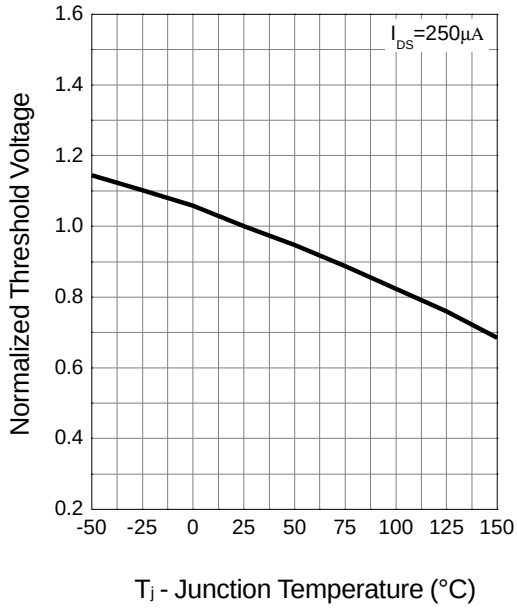
Drain-Source On Resistance

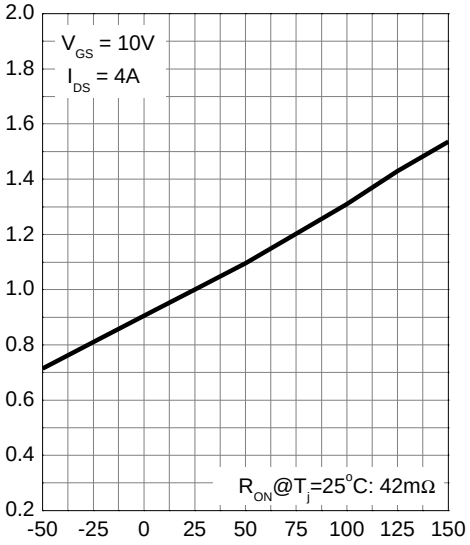


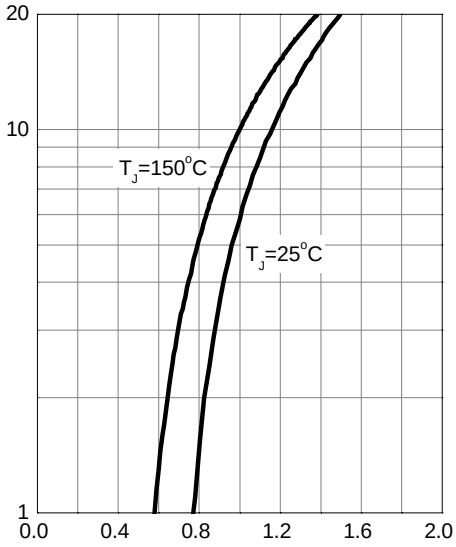
Transfer Characteristics

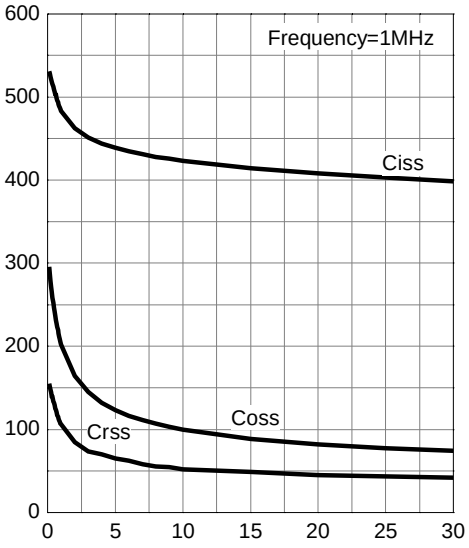


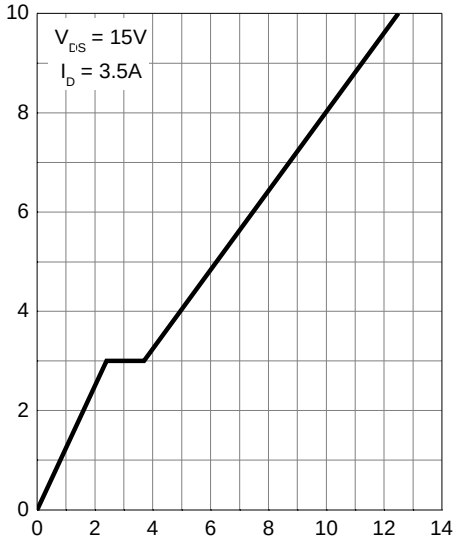
Gate Threshold Voltage




V_{GS} = 10V
I_{DS} = 4A
$R_{ON}@T_j$=25°C: 42mΩ
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
-50 -25 0 25 50 75 100 125 150

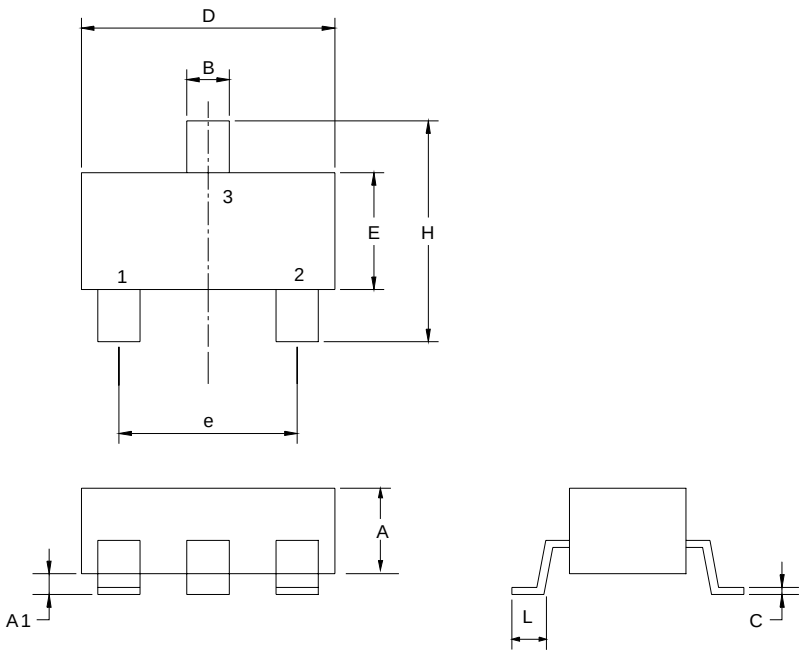

T_J=150°C
T_J=25°C
20
10
1
0.0 0.4 0.8 1.2 1.6 2.0


Frequency=1MHz
Ciss
Coss
Crss
600
500
400
300
200
100
0
0 5 10 15 20 25 30


V_{DS} = 15V
I_D = 3.5A
10
8
6
4
2
0
0 2 4 6 8 10 12 14

Packaging Information

SOT-23



Dim	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	1.00	1.30	0.039	0.051
A1	0.00	0.10	0.000	0.004
B	0.35	0.51	0.014	0.020
C	0.10	0.25	0.004	0.010
D	2.70	3.10	0.106	0.122
E	1.40	1.80	0.055	0.071
e	1.90/2.1 BSC.		0.075/0.083 BSC.	
H	2.40	3.00	0.094	0.118
L	0.37		0.015	