



Power MOSFETS

DATASHEET

LM20B30NGA3A

N-Channel
Enhancement Mode MOSFET

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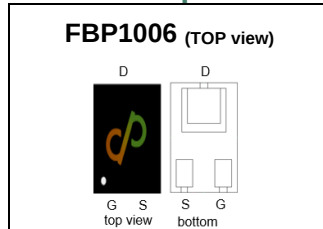


Quality Management Systems

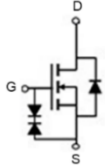
ISO 9001:2015 Certificate

N-Channel Enhancement Mode MOSFET

Pin Description



Symbol



Product Summary

Symbol	N-Channel	Unit
V_{DS}	20	V
$R_{DS(ON)-Max}$	230	m Ω
I_D	1.4	A

Feature

- Surface mount package
- Reliable and Rugged
- ROHS Compliant & Halogen-Free
- ESD Protection

Applications

- Small Signal Switch
- Load Switch

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM20B30NGA3A	FBP1006	Tape & Reel	10000 / Tape & Reel	☐ 3

Absolute Maximum Ratings ($T_J=25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter		N-Channel	Unit
V_{DS}	Drain-Source Voltage		20	V
V_{GS}	Gate-Source Voltage		± 8	
T_J	Maximum Junction Temperature		150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range		-55 to 150	$^\circ\text{C}$
$I_{DM}^{①}$	Pulse Drain Current Tested	$T_A=25^\circ\text{C}$	3.5	A
I_D	Continuous Drain Current	$T_A=25^\circ\text{C}$	1.4	A
		$T_A=70^\circ\text{C}$	1.1	
P_D	Maximum Power Dissipation	$T_A=25^\circ\text{C}$	0.7	W
		$T_A=70^\circ\text{C}$	0.4	

Thermal Characteristics

Symbol	Parameter		Rating	Unit
$R_{\theta JA}^{②}$	Thermal Resistance-Junction to Ambient	Steady State	180	$^\circ\text{C/W}$

Note ① : Max. current is limited by junction temperature

Note ② : Surface Mounted on 1in² FR-4 board with 1oz.

N-Channel Electrical Characteristics ($T_J=25^{\circ}\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Electrical Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250uA	20	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =16V, V _{GS} =0V	-	-	1	uA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250uA	0.5	-	1	V
I _{GSS}	Gate Leakage Current	V _{GS} =±8V, V _{DS} =0V	-	-	±10	uA
R _{DS(ON)} ®	Drain-Source On-state Resistance	V _{GS} =4.5V, I _{DS} =0.55A	-	190	230	mΩ
		V _{GS} =2.5V, I _{DS} =0.45A	-	234	305	
		V _{GS} =1.8V, I _{DS} =0.35A	-	303	455	
gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =0.55A	-	1.7	-	S
Dynamic Characteristics ④						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =10V, Freq.=1MHz	-	43	-	pF
C _{oss}	Output Capacitance		-	9	-	
C _{rss}	Reverse Transfer Capacitance		-	6	-	
td(ON)	Turn-on Delay Time	V _{GS} =4.5V,V _{DS} =10V, Id=2A,RGEN=6Ω	-	1.2	-	nS
tr	Turn-on Rise Time		-	25	-	
td(OFF)	Turn-off Delay Time		-	14	-	
tr	Turn-off Fall Time		-	15	-	
Qg	Total Gate Charge	V _{GS} =2.5V,V _{DS} =10V Id=1A	-	1.1	-	nC
Qg	Total Gate Charge	V _{GS} =4.5V,V _{DS} =10V, Id=1A	-	2	-	
Qgs	Gate-Source Charge		-	0.3	-	
Qgd	Gate-Drain Charge		-	0.3	-	
Source-Drain Characteristics						
VSD④	Diode Forward Voltage	ISD=0.35A, VGS=0V	-	0.75	1.1	V
trr	Reverse Recovery Time	IF=1A, VR=0V	-	9	-	nS
Qrr	Reverse Recovery Charge	dIF/dt=100A/μs	-	1	-	nC

Note ③ : Pulse test (pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$).

Note ④ : Guaranteed by design, not subject to production testing.

N- Channel Typical Characteristics

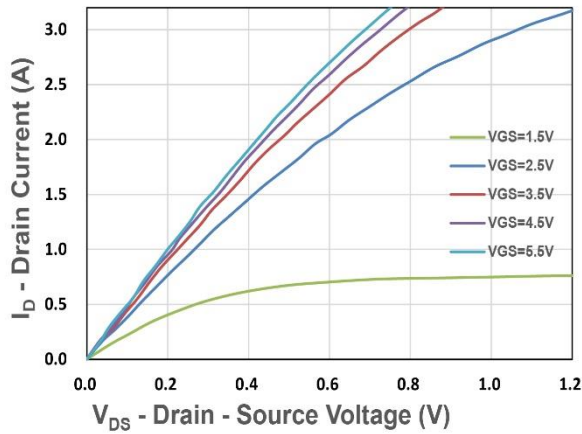


Figure 1. Output Characteristics

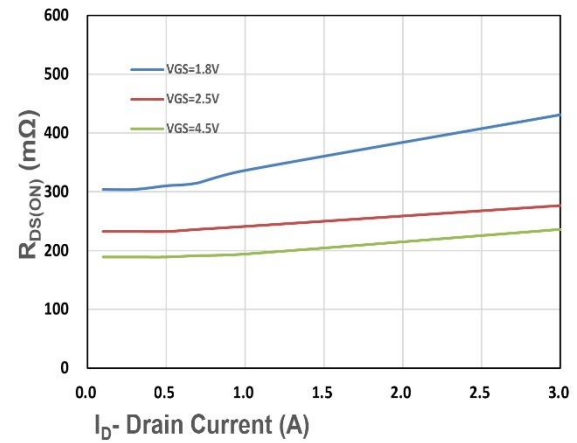


Figure 2. On-Resistance vs. I_D

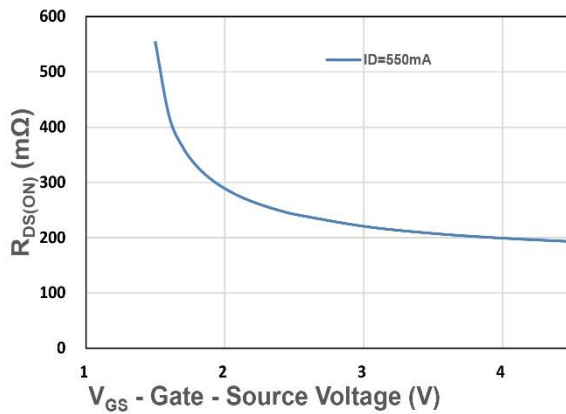


Figure 3. On-Resistance vs. V_{GS}

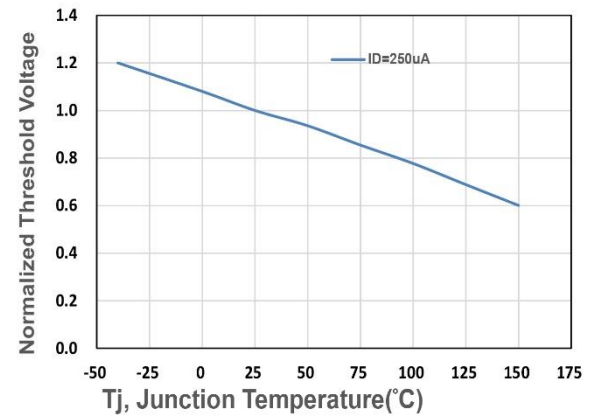


Figure 4. Gate Threshold Voltage

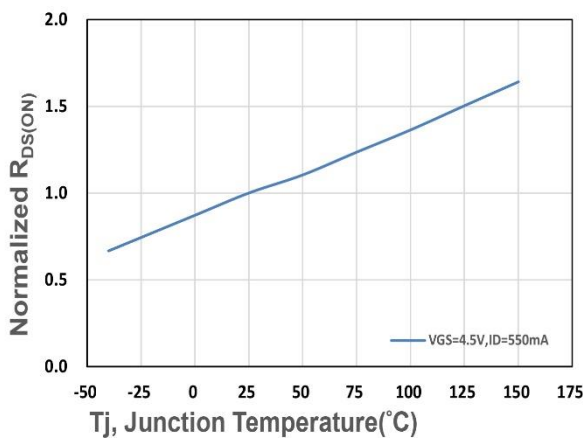


Figure 5. Drain-Source On Resistance

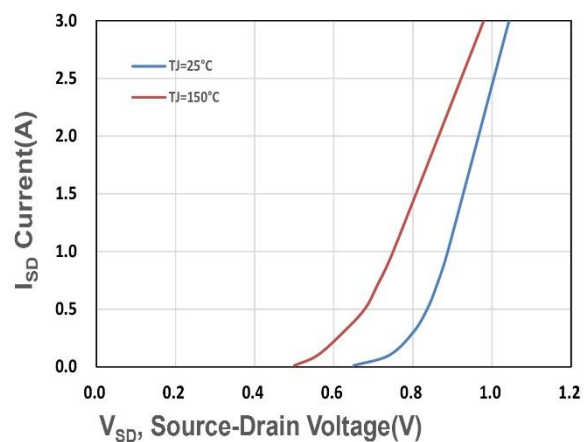


Figure 6. Source-Drain Diode Forward

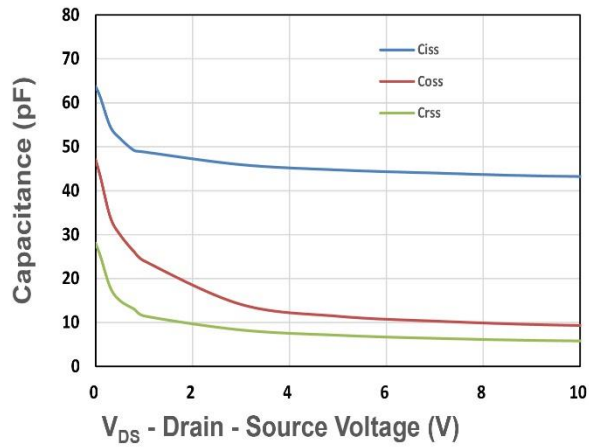


Figure 7. Capacitance

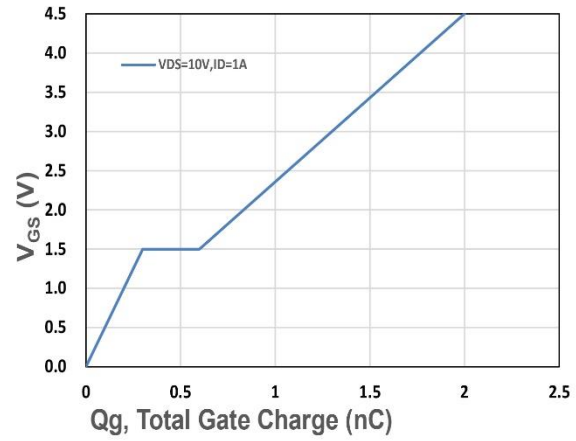


Figure 8. Gate Charge Characteristics

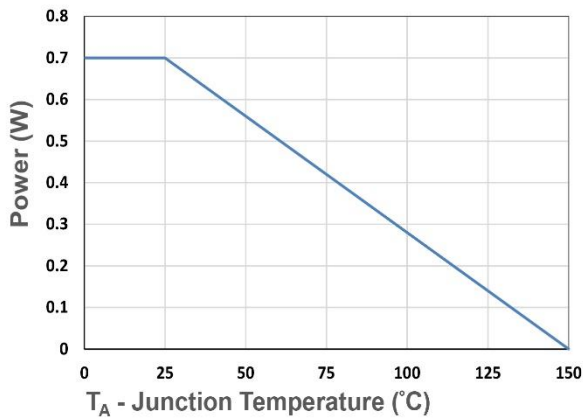


Figure 9. Power Dissipation

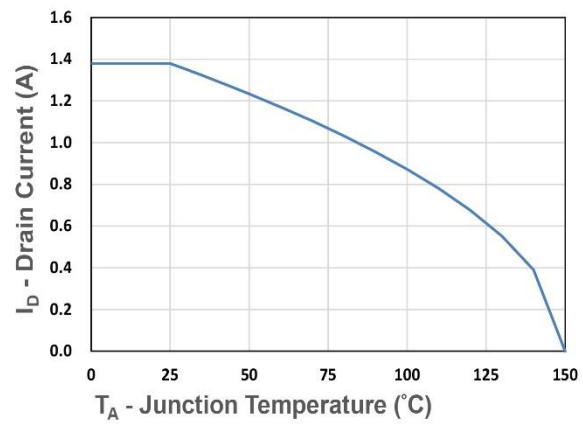


Figure 10. Drain Current

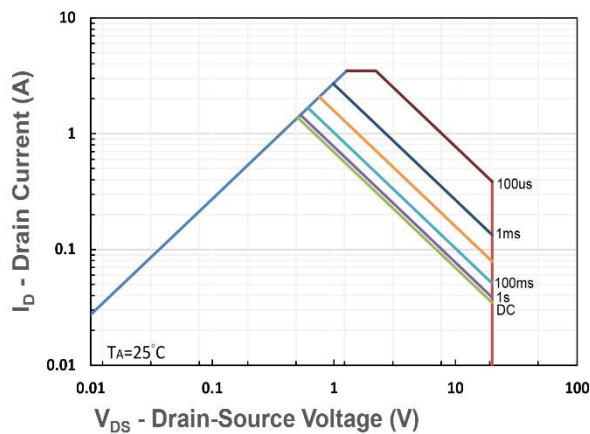


Figure 11. Safe Operating Area

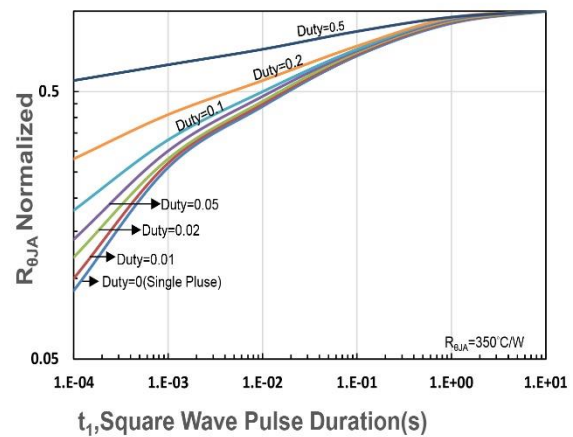


Figure 12. $R_{\theta JA}$ Transient Thermal Impedance