





Power MOSFETS

DATASHEET

LM20B30NGB3A

N-Channel
Enhancement Mode MOSFET

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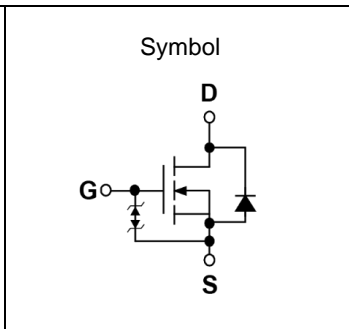
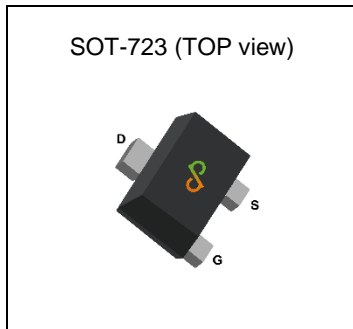


Quality Management Systems

ISO 9001:2015 Certificate

N-Channel Enhancement Mode MOSFET

Pin Description



Ordering Information

Symbol	N-Channel	Unit
V_{DSS}	20	V
$R_{DS(ON)-Max}$	240	mΩ
I_D	0.63	A

Feature

- 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
LM20B30NGB3A	SOT-723	Tape & Reel	8000 / Tape & Reel	0□

Note : □= Lot Code

Absolute Maximum Ratings (T_J=25°C Unless Otherwise Noted)

Symbol	Parameter		N-Channel	Unit
V_{DSS}	Drain-Source Voltage		20	V
V_{GSS}	Gate-Source Voltage		±8	
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	°C
$I_{DM}^{①}$	Pulse Drain Current Tested	$T_A=25^{\circ}C$	1.4	A
I_D	Continuous Drain Current	$T_A=25^{\circ}C$	0.63	A
		$T_A=70^{\circ}C$	0.5	
P_D	Maximum Power Dissipation	$T_A=25^{\circ}C$	0.15	W
		$T_A=70^{\circ}C$	0.1	

Thermal Characteristics

Symbol	Parameter		Rating	Unit
$R_{θJA}^{②}$	Thermal Resistance-Junction to Ambient	Steady State	833	°C/W

Note ① : Max. current is limited by bonding wire.

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

N-Channel Electrical Characteristics (T_J=25°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)} ^③	Drain-Source On-state Resistance	V _{GS} =4.5V, I _{DS} =550mA	-	200	240	mΩ
		V _{GS} =2.5V, I _{DS} =450mA	-	240	310	
		V _{GS} =1.8V, I _{DS} =350mA	-	310	465	
		V _{GS} =1.5V, I _{DS} =100mA	-	470	1500	
g_{fs}	Forward Transconductance	V _{DS} =5V, I _{DS} =550mA	-	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	-	
t_{d(ON)}	Turn-on Delay Time	V _{GS} =4.5V, V _{DS} =10V, I _D =2A, R _{GEN} =6Ω	-	1.2	-	nS
t_r	Turn-on Rise Time		-	25	-	
t_{d(OFF)}	Turn-off Delay Time		-	14	-	
t_f	Turn-off Fall Time		-	15	-	
Q_g	Total Gate Charge	V _{GS} =2.5V, V _{DS} =10V I _D =1A	-	1.1	-	nC
Q_g	Total Gate Charge	V _{GS} =4.5V, V _{DS} =10V, I _D =1A	-	2	-	
Q_{gs}	Gate-Source Charge		-	0.3	-	
Q_{gd}	Gate-Drain Charge		-	0.3	-	
Source-Drain Characteristics						
V_{SD} ^③	Diode Forward Voltage	I _{SD} =0.35A, V _{GS} =0V	-	0.75	1.1	V
t_{rr}	Reverse Recovery Time	I _F =1A, V _R =0	-	9	-	nS
Q_{rr}	Reverse Recovery Charge	dI _F /dt=100A/μs	-	1	-	nC

Note ③ : Pulse test (pulse width≤300us, duty cycle≤2%).

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

N-Channel Typical Characteristics

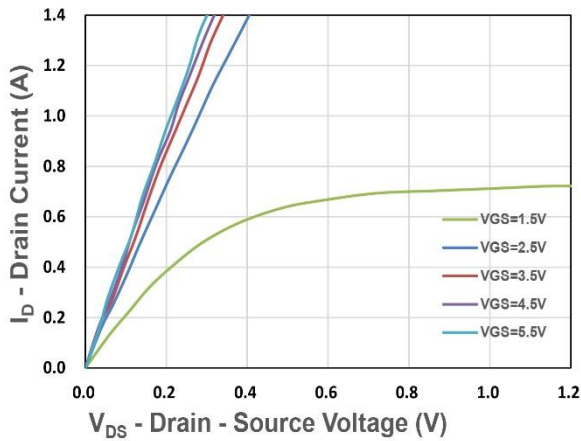


Figure 1. Output Characteristics

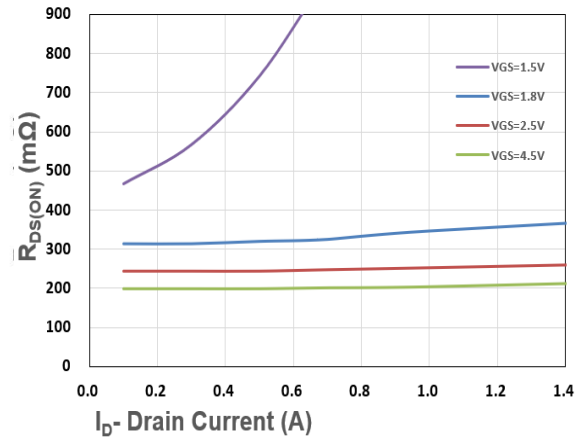


Figure 2. On-Resistance vs. ID

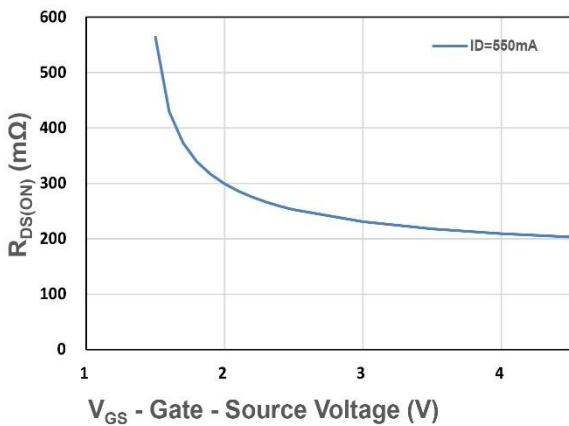


Figure 3. On-Resistance vs. VGS

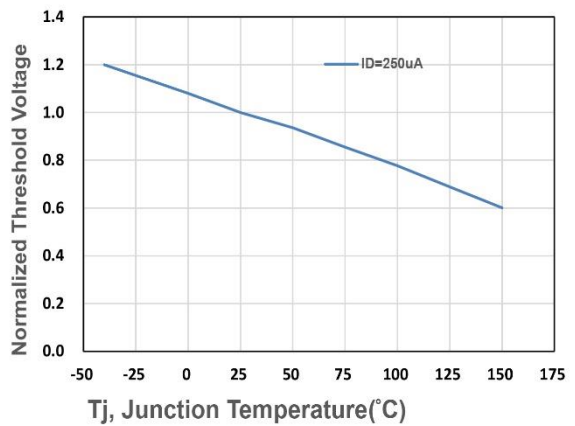


Figure 4. Gate Threshold Voltage

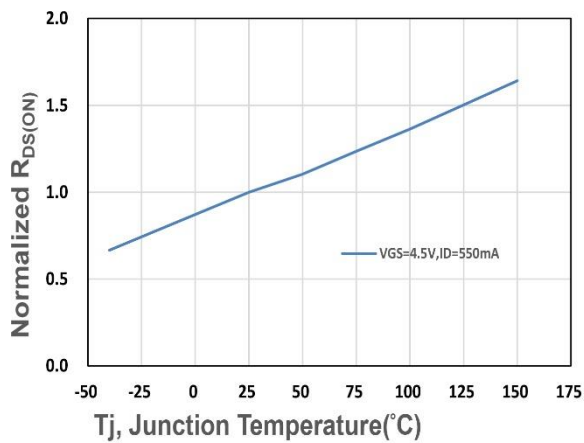


Figure 5. Drain-Source On Resistance

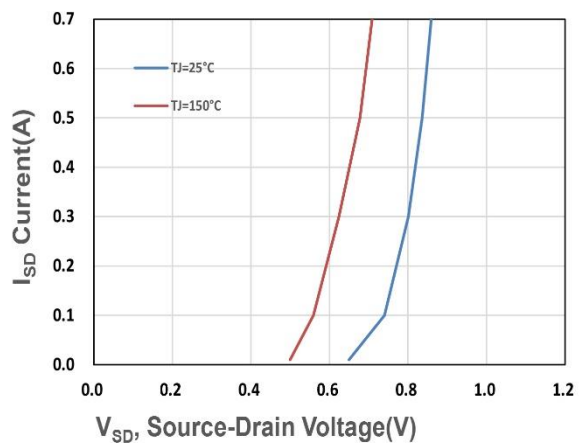


Figure 6. Source-Drain Diode Forward

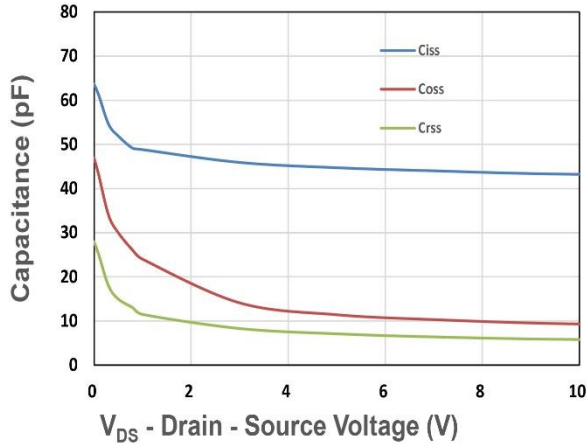


Figure 7. Capacitance

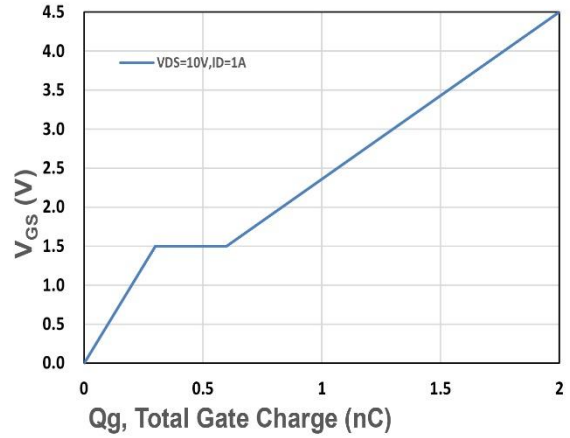


Figure 8. Gate Charge Characteristics

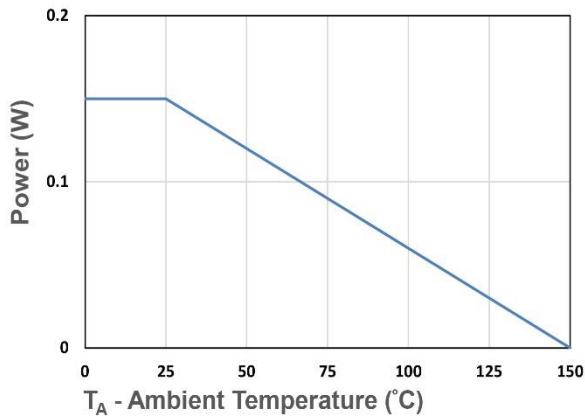


Figure 9. Power Dissipation

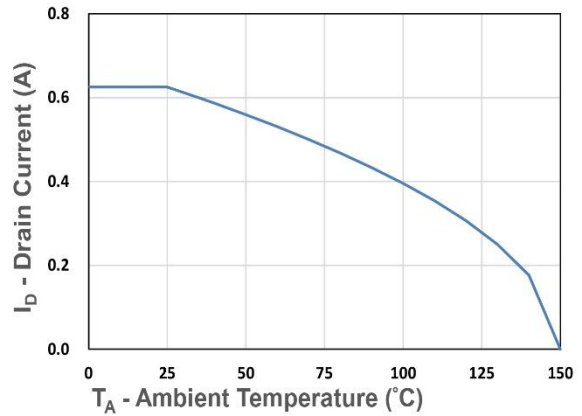


Figure 10. Drain Current

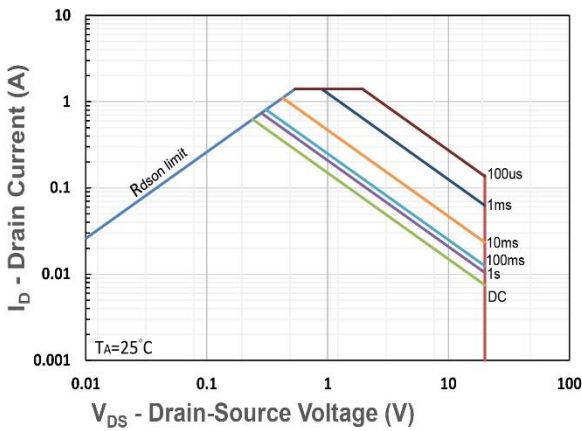


Figure 11. Safe Operating Area

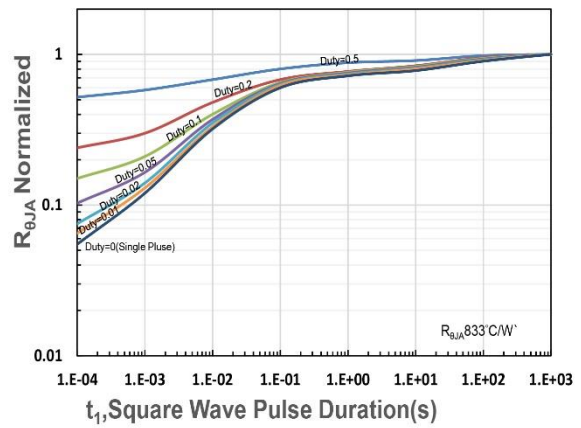


Figure 12. $R_{\theta JA}$ Transient Thermal Impedance