



Power MOSFETS


DATASHEET

LM20B50DGF6A

Dual N-Channel
Enhancement Mode MOSFET

 Leadpower-semiconductor Corp., Ltd

 sales@leadpower-semi.com

 (03) 6577339 FAX : (03) 6577229

 www.leadpower-semi.com

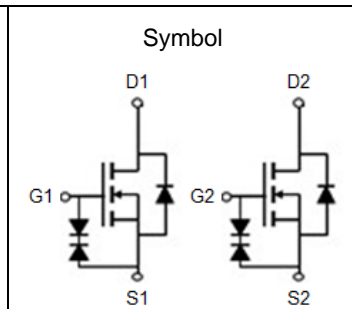
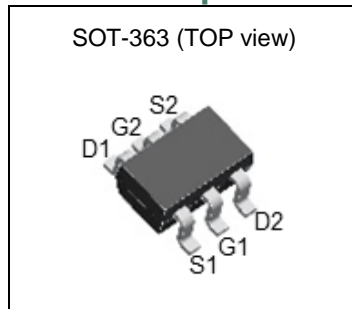


Quality Management Systems

ISO 9001:2015 Certificate

Dual N-Channel Enhancement Mode MOSFET

Pin Description



Ordering Information

Symbol	Dual N-Channel	Unit
V _{DSS}	20	V
R _{DS(ON)-Max}	300	mΩ
I _D	0.72	A

Feature

- Reliable and Rugged
- ROHS Compliant & Halogen-Free
- ESD Protection

Applications

- Power Management in DC/DC Converters
- Load Switch

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM20B50DGF6A	SOT-363	Tape & Reel	3000 / Tape & Reel	1□□□

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

Symbol	Parameter	Dual N-Channel	Unit	
V _{DSS}	Drain-Source Voltage	20	V	
V _{GSS}	Gate-Source Voltage	±12		
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°C	0.9	A
I _D ^②	Continuous Drain Current	T _A =25°C	0.72	A
		T _A =70°C	0.57	
P _D	Maximum Power Dissipation	T _A =25°C	0.25	W
		T _A =70°C	0.16	

Thermal Characteristics

Symbol	Parameter	Rating	Unit	
R _{θJA} ^③	Thermal Resistance-Junction to Ambient	Steady State	500	°C/W

Note ① : Max. current is limited by Bonding wire

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

Note ③ : Device mounted on an FR4 PCB, single-sided copper , tin-plated and standard footprint.

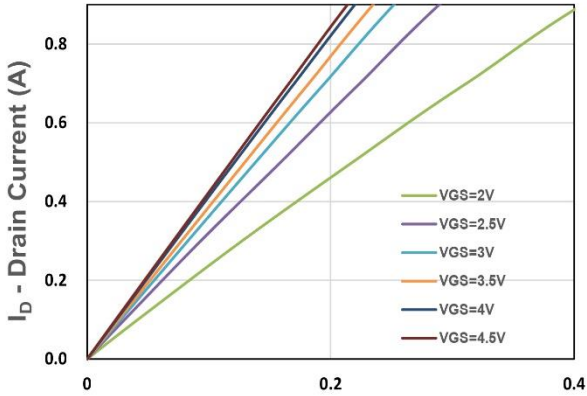
Dual N-Channel Electrical Characteristics (T_J=25°C Unless Otherwise Noted)

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	0.75	1	V
I_{GSS}	Gate Leakage Current	V _{GS} =±12V, V _{DS} =0V	-	-	±10	uA
R_{DS(ON)}^④	Drain-Source On-state Resistance	V _{GS} =4.5V, I _{DS} =0.6A	-	245	300	mΩ
		V _{GS} =2.5V, I _{DS} =0.4A	-	310	400	
		V _{GS} =1.8V, I _{DS} =0.35A	-	420	580	
gfs	Forward Transconductance	V _{DS} =3V, I _{DS} =0.3A	-	0.9	-	S
Dynamic Characteristics^⑥						
C_{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =10V, Freq.=1MHz	-	40	-	pF
C_{oss}	Output Capacitance		-	17	-	
C_{rss}	Reverse Transfer Capacitance		-	9.9	-	
td(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		-	24.5	-	
t_{d(OFF)}	Turn-off Delay Time		-	13.6	-	
t_f	Turn-off Fall Time		-	14.6	-	
Q_g	Total Gate Charge	V _{GS} =2.5V, V _{DS} =10V I _D =1A	-	0.54	-	nC
Q_g	Total Gate Charge	V _{GS} =4.5V, V _{DS} =10V, I _D =1A	-	1	-	
Q_{gs}	Gate-Source Charge		-	0.3	-	
Q_{gd}	Gate-Drain Charge		-	0.1	-	
Source-Drain Characteristics						
V_{SD}^④	Diode Forward Voltage	I _{SD} =0.3A, V _{GS} =0V	-	0.75	1.1	V
t_{rr}	Reverse Recovery Time	I _F =1A, V _R =10V	-	9.2	-	nS
Q_{rr}	Reverse Recovery Charge	diF/dt=100A/μs	-	0.82	-	nC

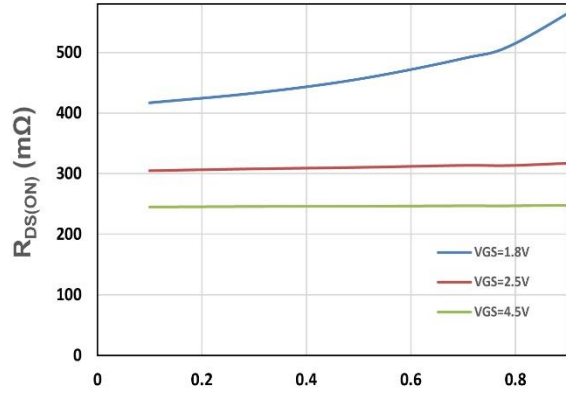
Note ④ : Pulse test (pulse width 300us, duty cycle 2%).

Note ⑤ : Guaranteed by design, not subject to production testing

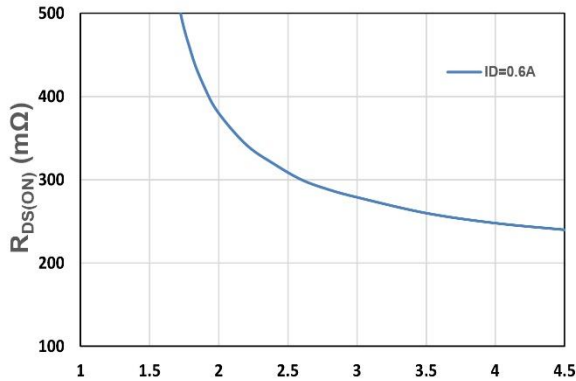
N-Channel Typical Characteristics



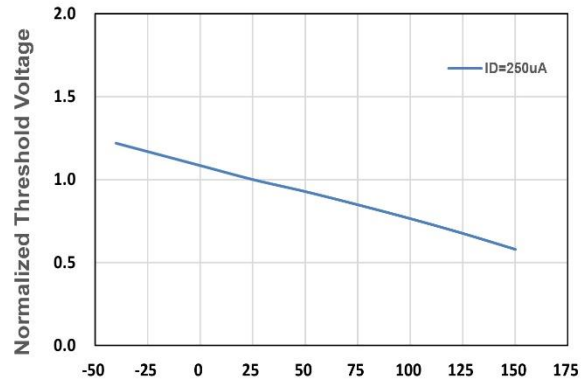
V_{DS} - Drain - Source Voltage (V)
Figure 1. Output Characteristics



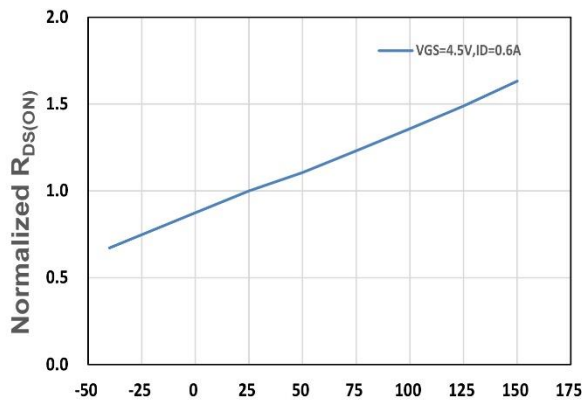
I_D - Drain Current (A)
Figure 2. On-Resistance vs. ID



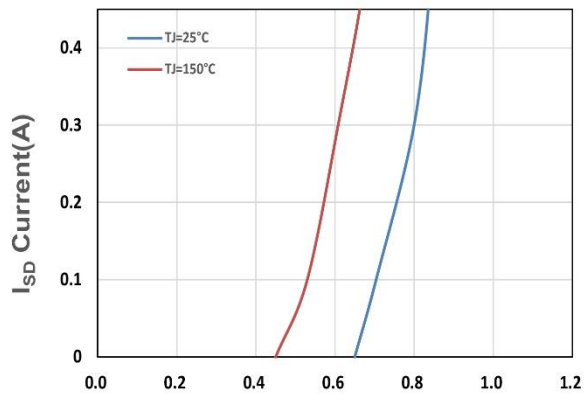
V_{GS} - Gate - Source Voltage (V)
Figure 3. On-Resistance vs. VGS



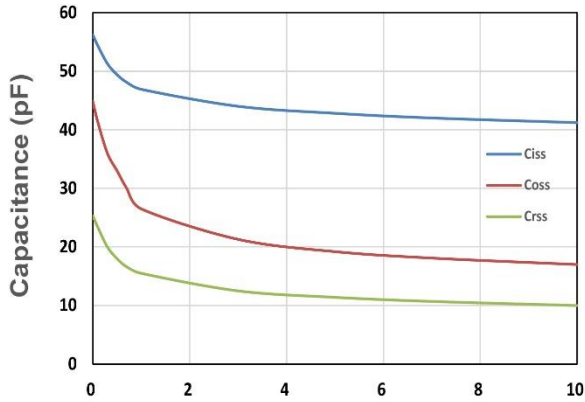
T_j , Junction Temperature($^{\circ}C$)
Figure 4. Gate Threshold Voltage



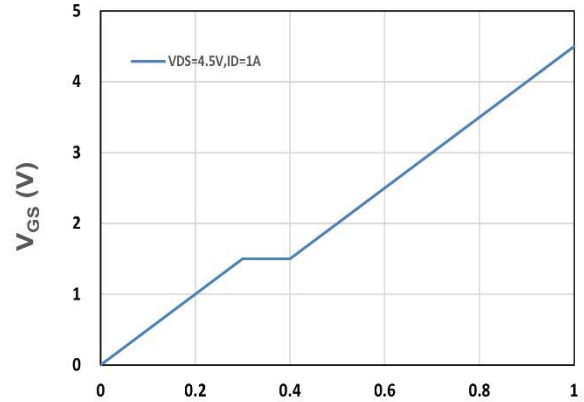
T_j , Junction Temperature($^{\circ}C$)
Figure 5. Drain-Source On Resistance



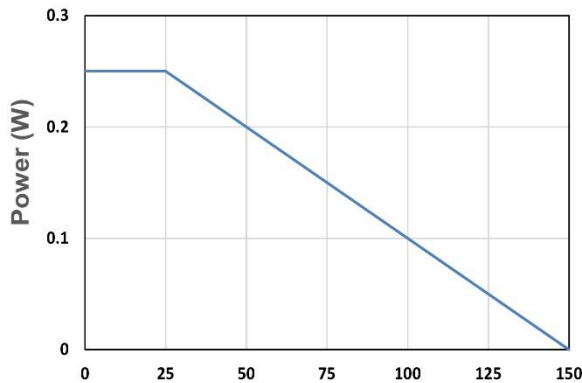
V_{SD} , Source-Drain Voltage(V)
Figure 6. Source-Drain Diode Forward



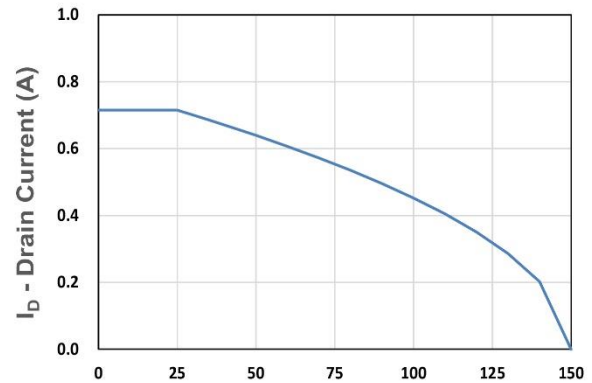
V_{DS} - Drain - Source Voltage (V)
Figure 7. Capacitance



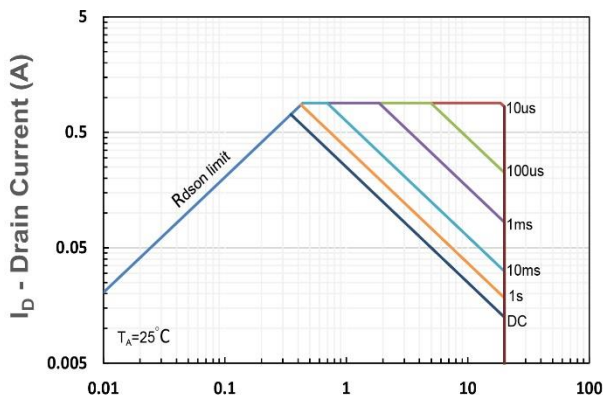
Q_g , Total Gate Charge (nC)
Figure 8. Gate Charge Characteristics



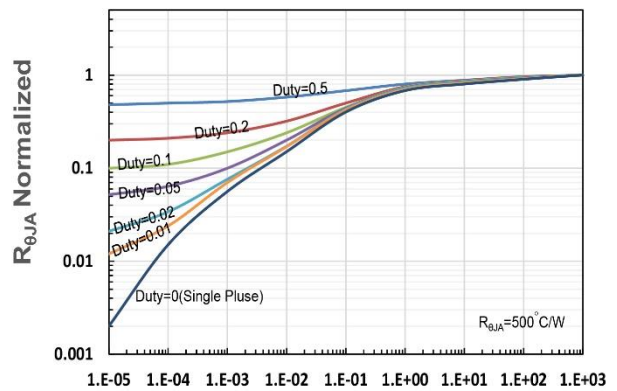
T_A - Ambient Temperature (°C)
Figure 9. Power Dissipation



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



V_{DS} - Drain-Source Voltage (V)
Figure 11. Safe Operating Area



t_1 , Square Wave Pulse Duration (s)
Figure 12. $R_{\theta JA}$ Transient Thermal Impedance