Leadpower
Semiconductor

Power MOSFETS
DATASHEET

LM20F40PGC3A

P-Channel
Enhancement Mode MOSFET

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Quality Management Systems

ISO 9001:2015 Certificate

LM20F40PGC3A

P-Channel Enhancement Mode MOSFET

Pin Description

SOT-523 (TOP view)	Symbol
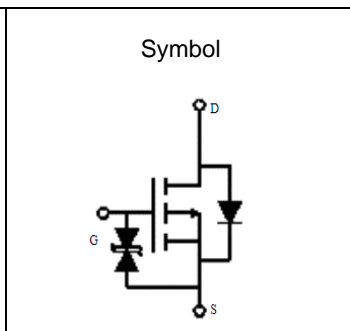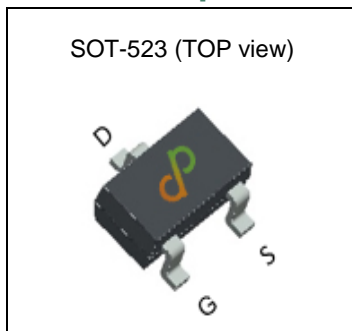
Ordering Information

Symbol	P-Channel	Unit
V_{DSS}	**-20**	**V**
$R_{DS(ON)-Max}$	**580**	**mΩ**
I_D	**-0.56**	**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
LM20F40PGC3A	SOT-523	Tape & Reel	3000 / Tape & Reel	1□□□

Absolute Maximum Ratings (T$_J$=25°C Unless Otherwise Noted)

Symbol	Parameter		P-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	-1.4	A
I_D	Continuous Drain Current	T_A=25°C	-0.56	A
		T_A=70°C	-0.45	
P_D	Maximum Power Dissipation	T_A=25°C	0.28	W
		T_A=70°C	0.18	

Thermal Characteristics

Symbol	Parameter		Rating	Unit
$R_{θJA}$[②]	Thermal Resistance-Junction to Ambient	Steady State	452	°C/W

Note ① : Max. current is limited by junction temperature.
Note ② : Surface Mounted on 1in^2 FR-4 board with 1oz.

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P-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$_{DS(ON)}$ [3]	Drain-Source On-state Resistance	V$_{GS}$=-4.5V, I$_{DS}$=-550mA	-	482	580	mΩ
		V$_{GS}$=-2.5V, I$_{DS}$=-450mA	-	666	865	
		V$_{GS}$=-1.8V, I$_{DS}$=-350mA	-	1037	1566	
gfs	Forward Transconductance	V$_{DS}$=-5V, I$_{DS}$=-550mA	-	1	-	S
Dynamic Characteristics [4]						
C$_{iss}$	Input Capacitance	V$_{GS}$=0V, V$_{DS}$=-10V, Freq.=1MHz	-	58	-	pF
C$_{oss}$	Output Capacitance		-	5.7	-	
C$_{rss}$	Reverse Transfer Capacitance		-	4.4	-	
td$_{(ON)}$	Turn-on Delay Time	V$_{GS}$=-4.5V,V$_{DS}$=-10V, I$_D$=-1A,R$_{GEN}$=3Ω	-	0.4	-	uS
t$_r$	Turn-on Rise Time		-	0.03	-	
t$_{d(OFF)}$	Turn-off Delay Time		-	0.04	-	
t$_f$	Turn-off Fall Time		-	1.1	-	
Q$_g$	Total Gate Charge	V$_{GS}$=-2.5V,V$_{DS}$=-10V I$_D$=-0.55A	-	0.6	-	nC
Q$_g$	Total Gate Charge	V$_{GS}$=-4.5V,V$_{DS}$=-10V, I$_D$=-0.55A	-	1	-	
Q$_{gs}$	Gate-Source Charge		-	0.17	-	
Q$_{gd}$	Gate-Drain Charge		-	0.18	-	
Source-Drain Characteristics						
V$_{SD}$ [3]	Diode Forward Voltage	I$_{SD}$=-0.55A, V$_{GS}$=0V	-	-0.75	-1.1	V

Note ③ : Pulse test (pulse width≤300us, duty cycle≤2%).
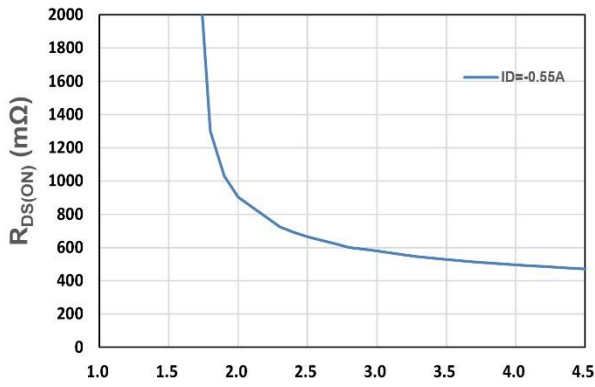Note ④ : Guaranteed by design, not subject to production testing.

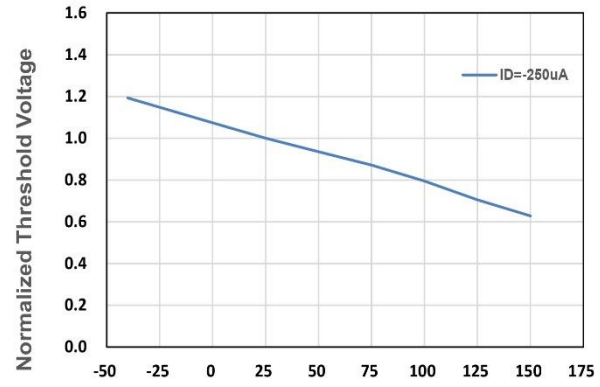# LM20F40PGC3A

P-Channel Typical Characteristics
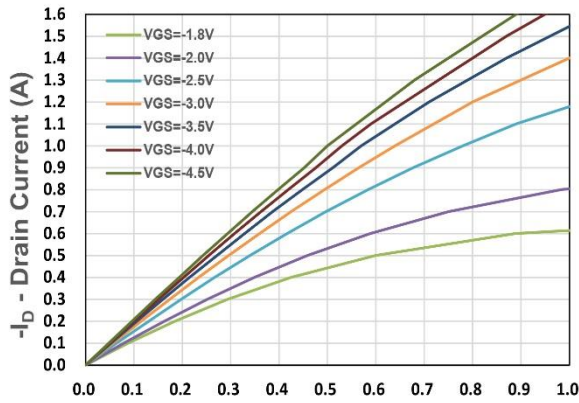
Figure 1. Output Characteristics
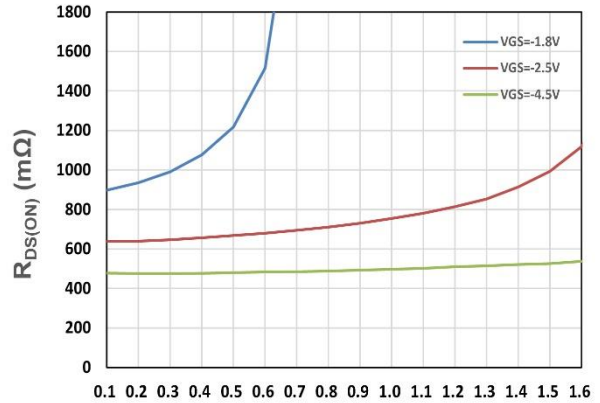
Figure 2. On-Resistance vs. ID

Figure 3. On-Resistance vs. VGS

Figure 4. Gate Threshold Voltage
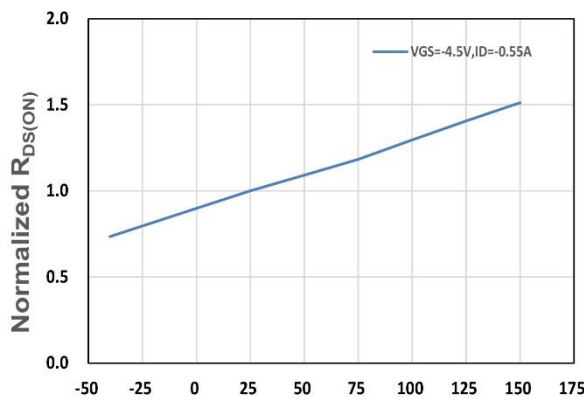
Figure 5. Drain-Source On Resistance
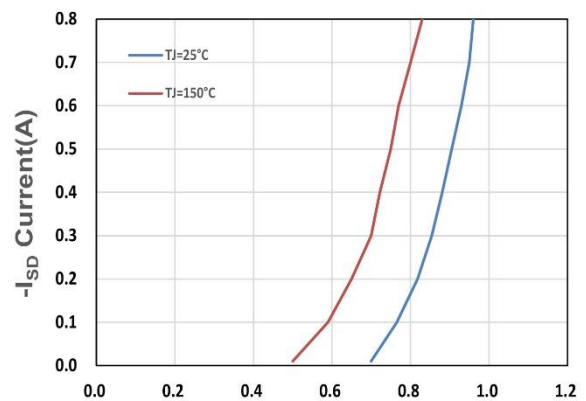
Figure 6. Source-Drain Diode Forward

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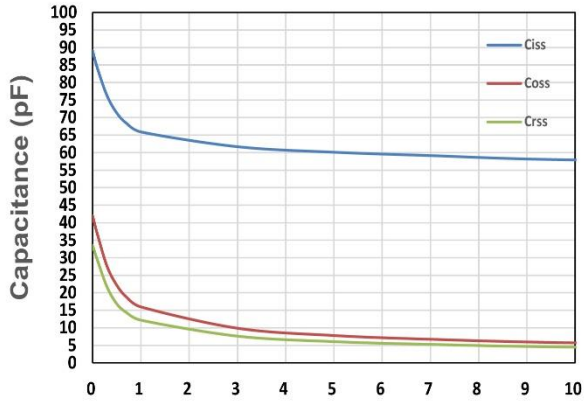
Figure 7. Capacitance
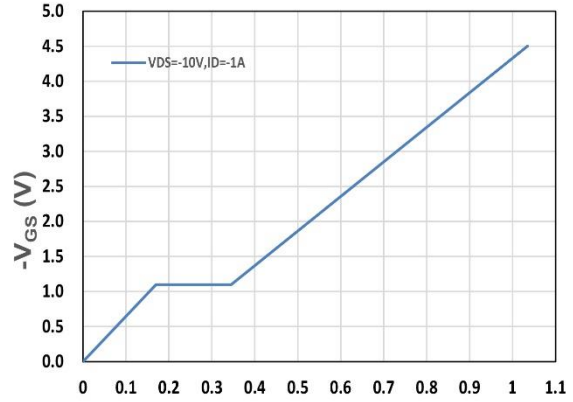
Figure 8. Gate Charge Characteristics
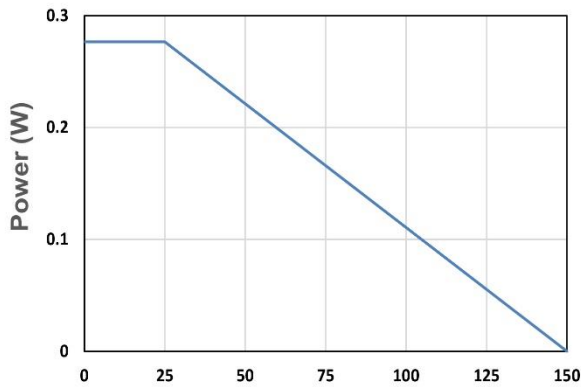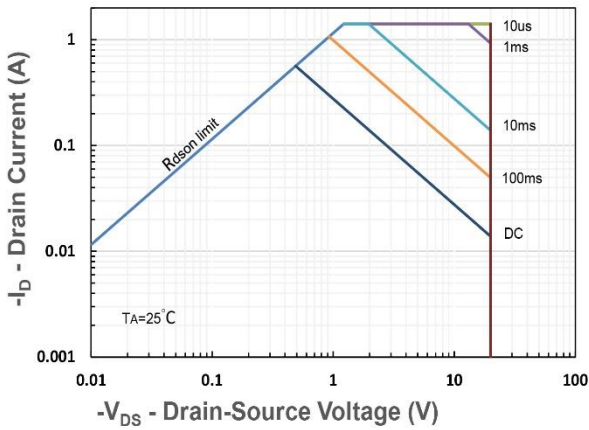

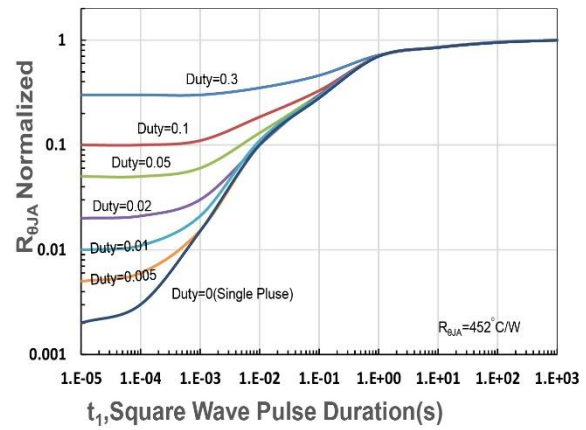Figure 9. Power Dissipation
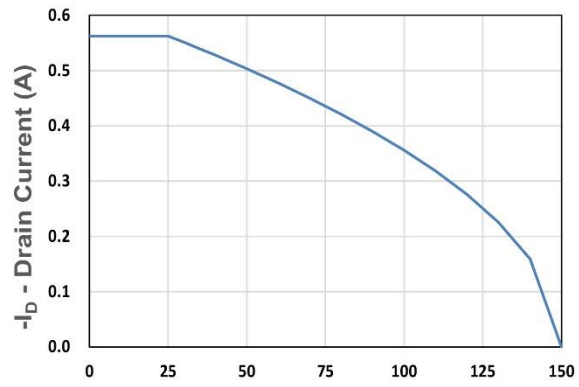
Figure 10. Drain Current

Figure 11. Safe Operating Area

Figure 12. RθJA Transient Thermal Impedance