GOSTONE

RoHS COMPLIANT

GMT180P02D

P-Channel -20V, 18mΩ max, MOSFET

Product Summary

| V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
-20	18@ V_{GS} = -4.5V	-10

## General Information

Shipping
- ❖ One shipping options is offered as standard
- ❖ Un-sawn wafer

Handling
- ❖ Product must be handled only at ESD safe workstations. Standard ESD precautions and safe work environments are as defined in MIL-HDBK-263.
- ❖ Product must be handled only in a class 10,000 or better-designated clean room environmen

Features
- ❖ Fast Switching
- ❖ Low On-Resistance
- ❖ Low Gate Charge

Application
- ❖ Load Switch
- ❖ Motor Control
- ❖ Power Management
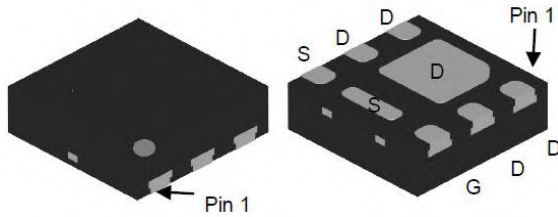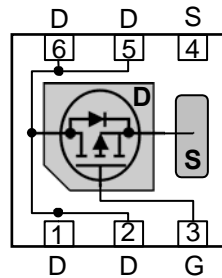
Equivalent circuit

DFN2020-6L
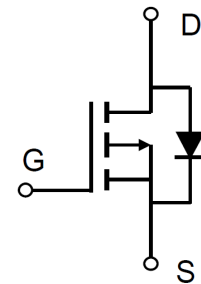
Absolute Maximum Rating (Ta=25°C)

Parameter		Symbol	Limit	Unit
Drain-source voltage		V_{DS}	-20	V
Gate-source voltage		V_{GS}	±12	
Continuous drain current (V_{GS}=-4.5V)[1]	T_A=25°C	I_D	-10	A
	T_A=70°C		-7	
Pulsed drain current[2]		$I_{D,pulse}$	-32	
Power dissipation	T_A=25°C	P_D	1.2	W
	T_A=70°C		0.73	W
Operating junction and storage temperature range		T_J, T_{stg}	-55 to 150	°C

Thermal Characteristic (Ta=25°C)

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Ambient [3]	$R_{\theta JA}$	85	110	°C/W
Thermal Resistance, Junction-to-Case [3]	$R_{\theta JC}$	34	44	°C/W

Electrical characteristics (Ta=25°C ± 3°C)

Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Static parameter [4]						
Drain to source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = -250 µA	-20			V
Gate-source threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250 µA	-0.4	-0.7	-1.0	V
Gate-body leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±12 V			±100	nA
Zero gate voltage drain current	I_{DSS}	V_{DS} = -20 V, V_{GS} = 0 V			-1	µA
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} = -4.5V, I_D = -8 A		14.2	18	mΩ
		V_{GS} = -2.5V, I_D = -4 A		18	20	mΩ
Forward transconductance	g_{fs}	VDS = -5.0V, ID = -8A		15		S
Gate resistance	R_g	VGS = 0V, VDS = 0V, f = 1MHz		22		Ω
Dynamic[5]						
Total gate charge	Q_g	VDS = -10V, ID = -8A VGS = -4.5V		33		nC
Gate-source charge	Q_{gs}			5		
Gate-drain charge	Q_{gd}			8		
Turn-on delay time	$t_{d(on)}$	VGS = -4.5V, VDS = -10V ID = -6 A, RGEN = 1.0Ω		10		ns
Rise time	t_r			33		
Turn-off delay time	$t_{d(off)}$			28		
Fall time	t_f			8		
Input capacitance	C_{iss}	V_{DS} = -10 V, V_{GS} = 0 V, f = 1 MHz		1105		pF
Output capacitance	C_{oss}			147		
Reverse transfer capacitance	C_{rss}			128		
Reverse Diode Characteristics [5]						
Diode forward voltage	V_{SD}	IS = -2.0A, VGS = 0V		-0.9	-1.2	V
Diode Forward Current	I_s	TA = 25°C			-10	A

Notes

1. This current is chip limited, whiich is calculated based on Rthjc.
2. This current is calculated on single pulse with 10µs Pulse & Duty Cycle = 1%.
3. Device mounted on FR-4 substrate PC board with 2oz copper in 1inch square cooling area.
4. Short duration pulse test used to minimize self-heating effect.
5. Defined by design, not subject to production.

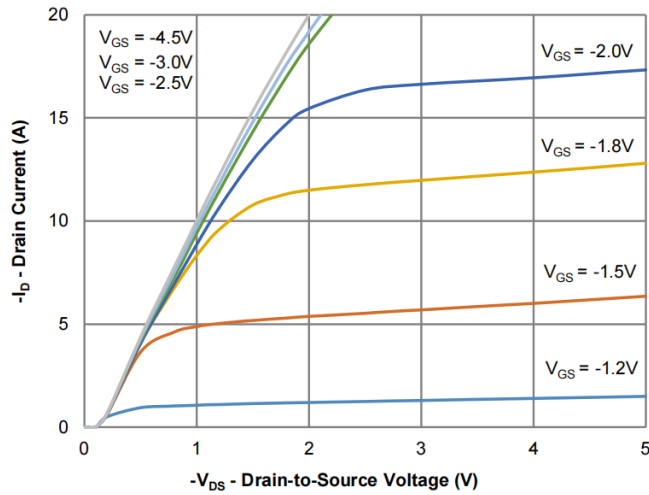## Electrical characteristics diagrams

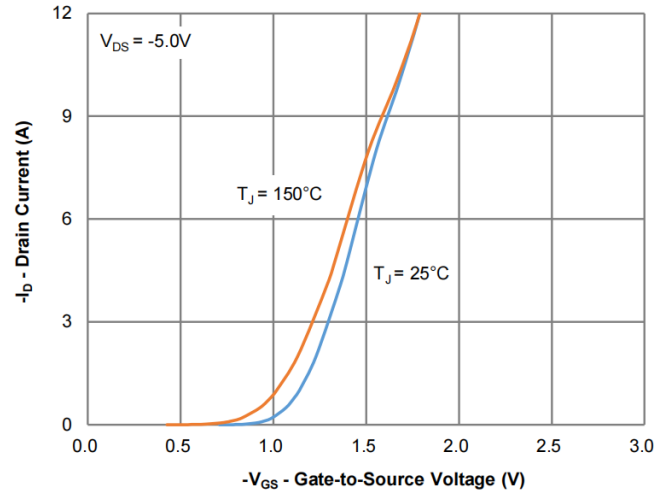Figure 1: Output Characteristics

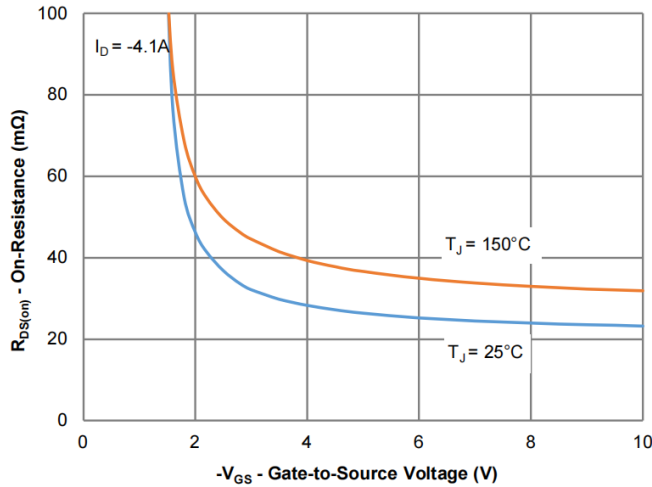
Figure 2: Transfer Characteristics

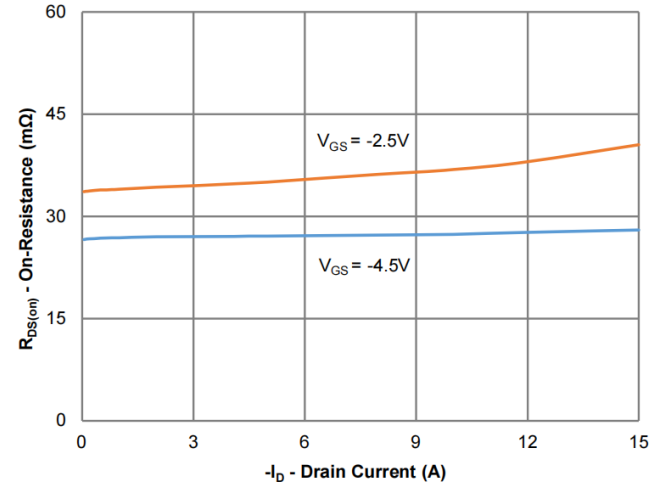Figure 3: On-Resistance vs. Gate-Source Voltage

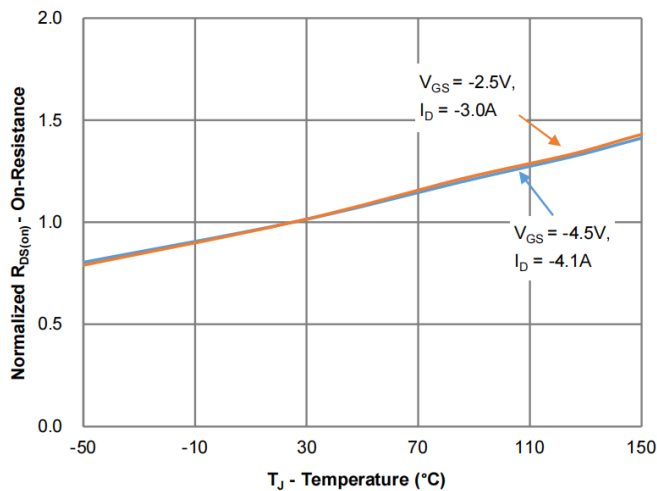Figure 4: On-Resistance vs. Gate-Source Voltage

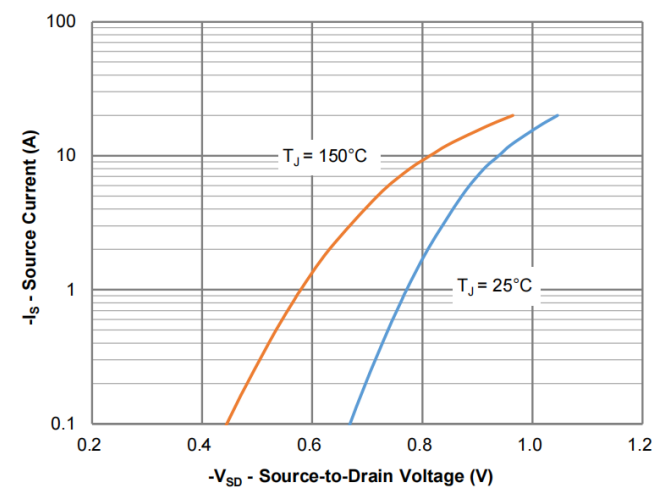Figure 5: On-Resistance vs. Junction Temperature
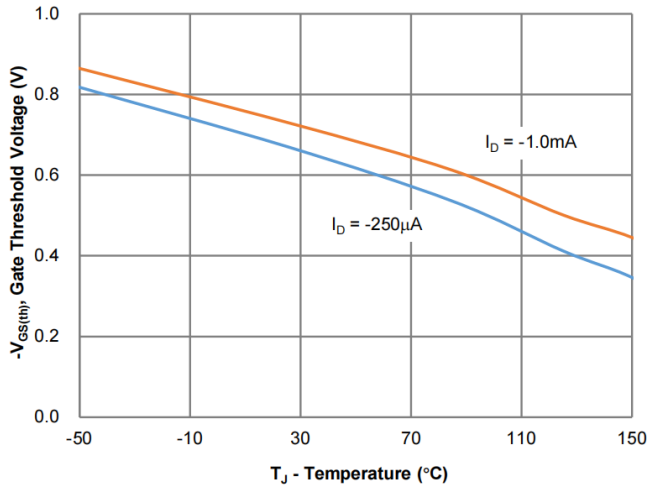

Figure 6: Source-Drain Diode Forward Voltage

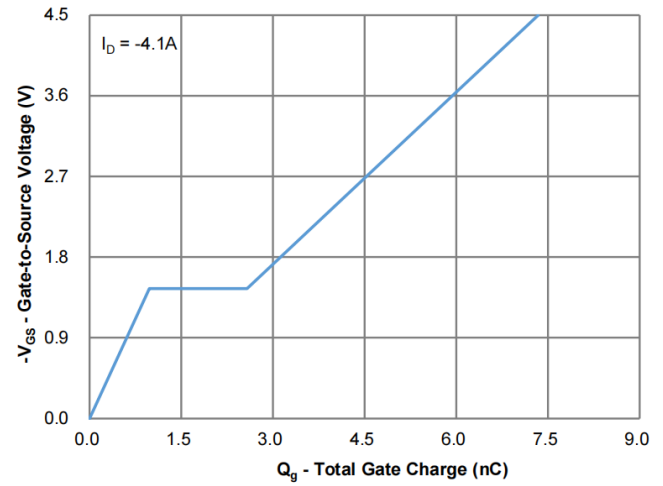Figure 7: Gate Threshold Variation vs. Junction Temperature

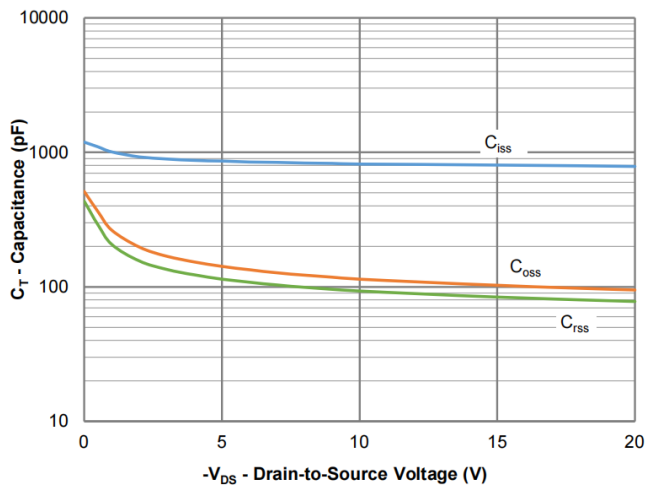Figure 8: Gate Charge Characteristics
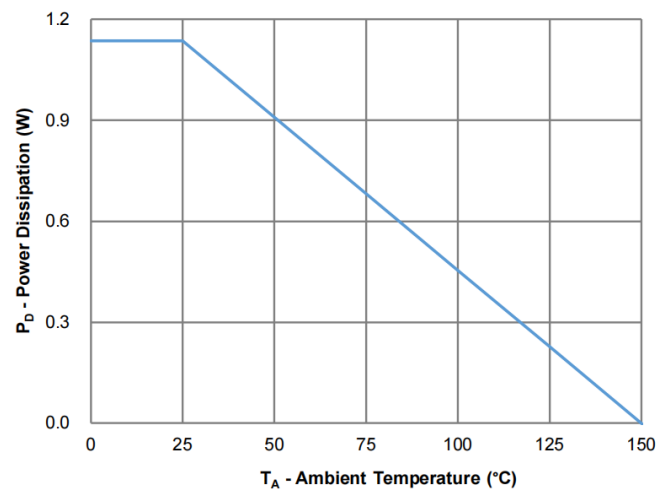

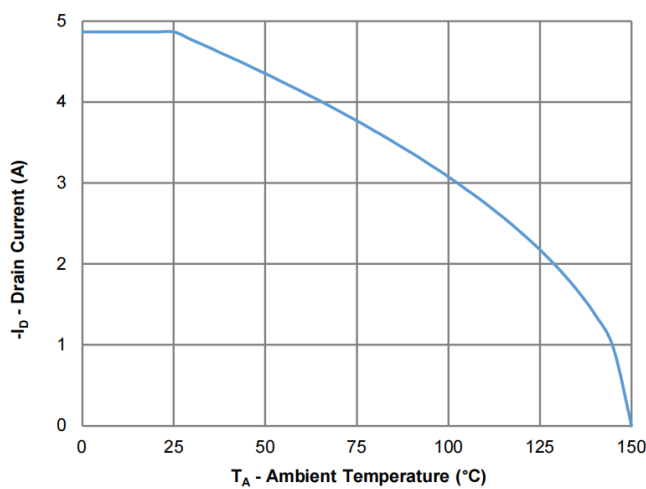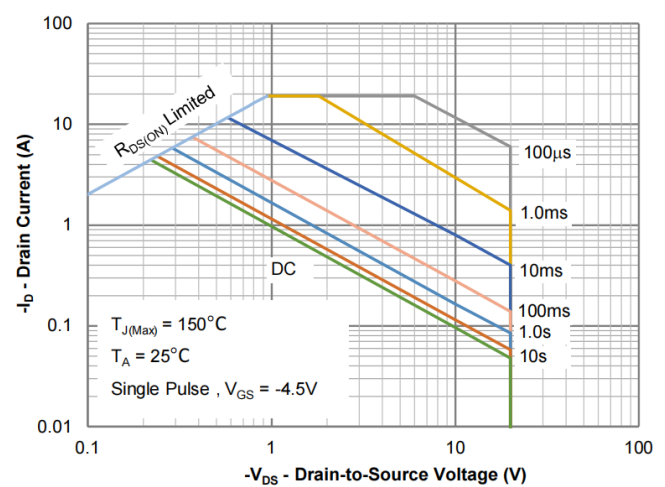Figure 9: Capacitance Characteristics

Figure 10: Power Derating

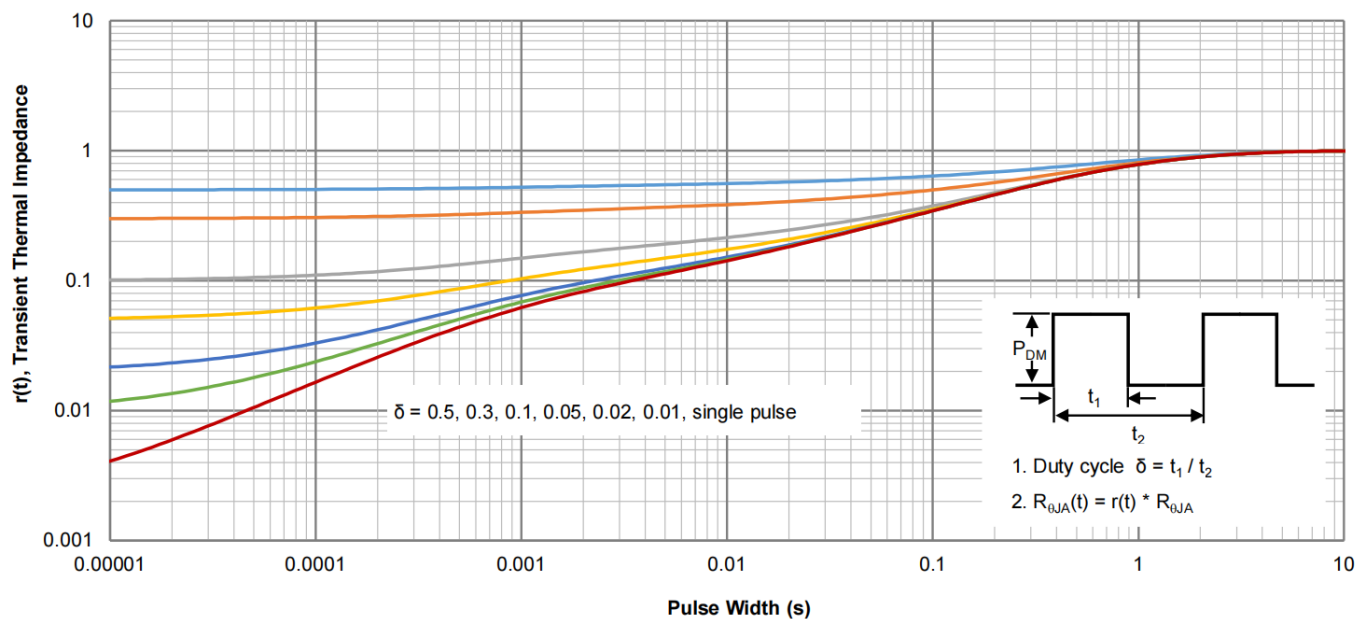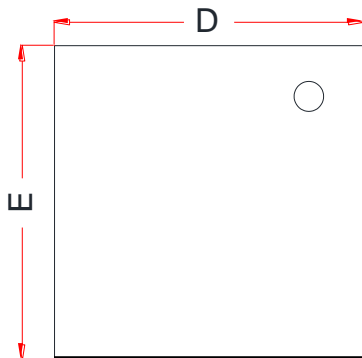Figure 11: Current Derating
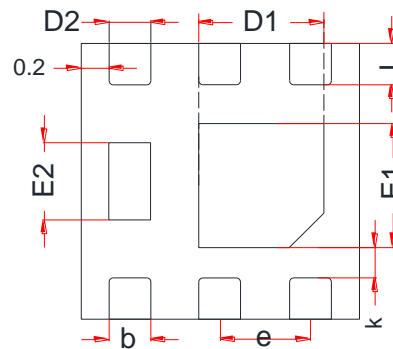

Figure 12: Safe Operating Area

Figure 13: Normalized Maximum Transient Thermal Impedance

Package outline dimensions   DFN2020-6L

TOP VIEW

BOTTOM VIEW
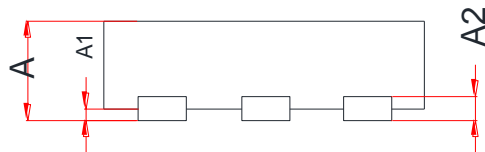
SIDE VIEW

Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.70	0.75	0.85
A1	0.00	0.02	0.05
A2	0.20 Ref.		
b	0.25	0.30	0.35
D	1.95	2.00	2.05
D1	0.85	0.90	0.95
D2	0.25	0.30	0.35
E	1.95	2.00	2.05
E1	0.75	0.80	0.85
E2	0.56 Ref.		
e	0.65 BSC.		
L	0.30	0.35	0.40
K	0.20	-	-

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