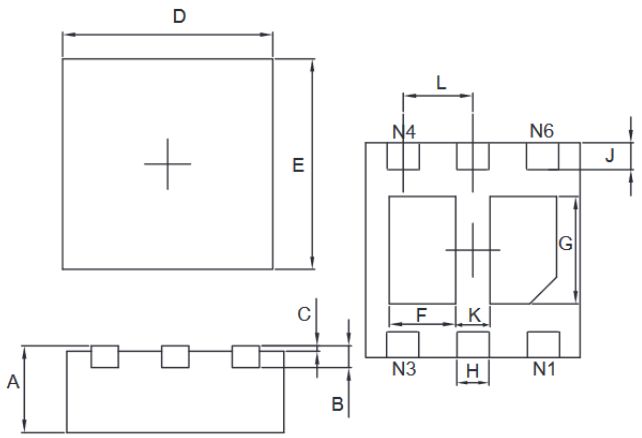
N-Channel Enhancement Mode MOSFET

Primary characteristics			
Symbol	**Parameter**	**Value**	**Unit**
I_D	Continuous drain current	9.5	A
V_{DSS}	Drain source voltage	20	V
R_{DSON}	Static drain-source on-resistance	29	mΩ MAX

Features

- **DFN2020-6L** case for easy automatic insertion
- Pb-free and **RoHS** compliant
- Low $R_{DS(ON)}$
- Super low gate charge
- Excellent c_{dV} / d_t effect decline
- Advanced high cell density trench technology
- Molding compound: UL Flammability Classification Rating 94V-0
- Terminals: matte tin-plated leads; solderability-per MIL-STD-202, method 208

Case dimensions



DFN2020-6L

	A	B	C	D	E	F	G	H	J	K	L
TYP	0.80	0.2	0.025	2.00	2.00	0.56	0.96	0.30	0.275	0.30	0.65
MIN	0.75		0.000	1.95	1.95	0.44	0.84	0.25	0.175	0.25	
MAX	0.85		0.050	2.05	2.05	0.69	1.09	0.35	0.375	0.35	

All measurements in mm

Maximum ratings (T_A = 25°C unless otherwise noted)			
Characteristic	**Symbol**	**Value**	**Unit**
Drain-source voltage	V_{DSS}	20	V
Gate-source voltage	V_{GSS}	±8	V
Continuous drain current	I_D	9.5	A
Pulsed drain current ($T_{J(max)}$=150°C)	I_{DM}	38	A
Thermal resistance junction-to-air	$R_{\theta JA}$	52	°C/W
Power Dissipation (T_C=25°C, $T_{J(max)}$=150°C)	P_D	2.4	W
Operating junction temperature range	T_J, T_{STG}	-55 ~ 150	°C

Electrical characteristics (T_A = 25°C)						
Characteristic	**Test condition**	**Symbol**	**Value**			**Unit**
			Min.	**Typ.**	**Max.**	
Drain-source breakdown voltage	V_{GS}=0V, I_D=250µA	V_{DSS}	20	-	-	V
Zero gate voltage drain current	V_{DS}=20V, V_{GS}=0V	I_{DSS}	-	-	1.0	µA
Gate body leakage current	V_{GS}=±8V, V_{DS}=0V	I_{GSS}	-	-	±100	nA
Gate threshold voltage	V_{DS}=V_{GS}, I_D=250µA	$V_{GS(TH)}$	0.4	0.8	1.0	V
Static drain-source on-state resistance [2]	V_{GS}=10V, I_D=20A	$R_{DS(ON)}$	-	16	23	mΩ
	V_{GS}=4.5V, I_D=10A		-	20	29	

Dynamic electrical characteristics						
Characteristic	**Test condition**	**Symbol**	**Value**			**Unit**
			Min.	**Typ.**	**Max.**	
Input capacitance	V_{DS}=8.0V V_{GS}=0V f=1.0MHz	C_{ISS}	-	754	-	pF
Output capacitance		C_{OSS}	-	145	-	
Reverse transfer capacitance		C_{RSS}	-	139	-	

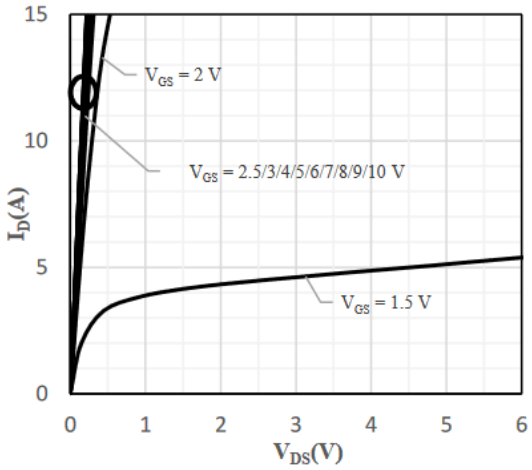
Switching characteristics						
Characteristic	**Test condition**	**Symbol**	**Value**			**Unit**
			Min.	**Typ.**	**Max.**	
Turn ON delay time	V_{DD}=10V V_{GS}=4.5V I_D=1.0A R_G=6.0Ω	$t_{d(ON)}$	-	15	-	ns
Turn ON rise time		t_r	-	40	-	
Turn OFF delay time		$t_{d(OFF)}$	-	48	-	
Turn OFF fall time		t_f	-	31	-	
Total gate-charge	V_{DD}=10V V_{GS}=4.5V I_D=5.0A	Q_G	-	12	-	nC
Gate to source charge		Q_{GS}	-	1.7	-	
Gate to drain (Miller) charge		Q_{GD}	-	4.2	-	

Source-drain diode characteristics						
Characteristic	**Test condition**	**Symbol**	**Value**			**Unit**
			Min.	**Typ.**	**Max.**	
Diode forward voltage [2]	I_{SD}=1.8A, V_{GS}=0V, T_J=25°C	V_{SD}	-	-	1.2	V
Diode continuous forward current	T_A=25°C	I_S	-	-	9.5	A
Pulsed source-drain current [2]		I_{SM}	-	-	38	

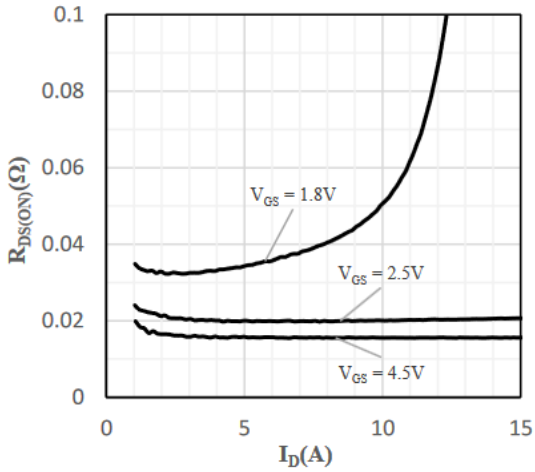
Notes:
1) The data tested when surface mounted on a 1 inch^2 FR-4 board with 2oz copper
2) The data tested by pulsed, pulse width ≤300µs, duty cycle ≤2%

Typical characteristics

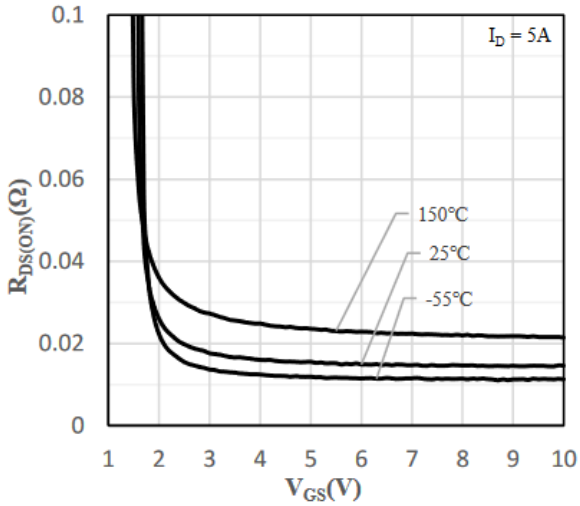
ON region characteristics



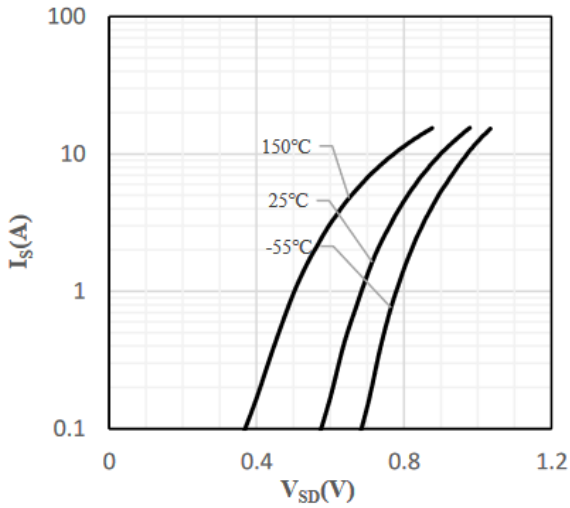
$R_{DS(ON)}$ vs. drain current



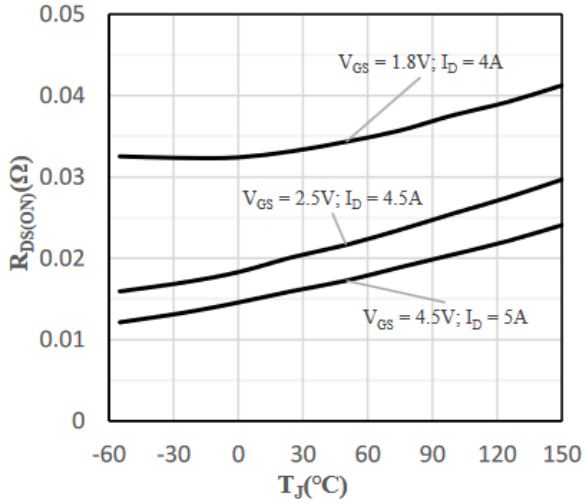
ON resistance vs. gate-source voltage



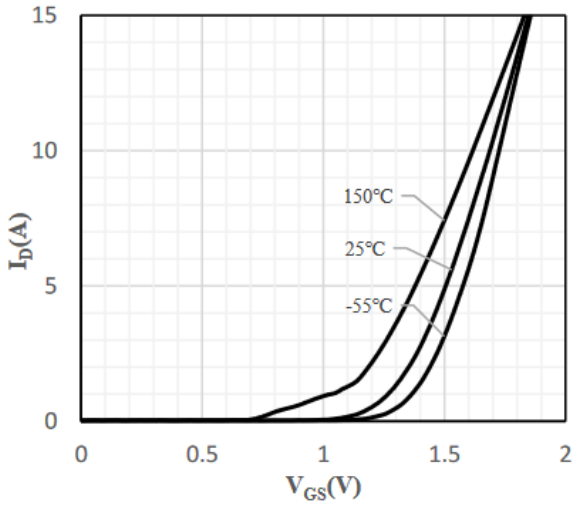
Body-diode characteristics



ON-resistance vs. junction temperature

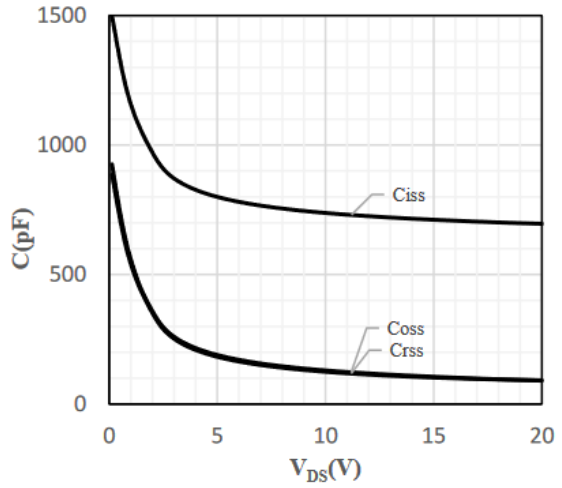


Transfer characteristics

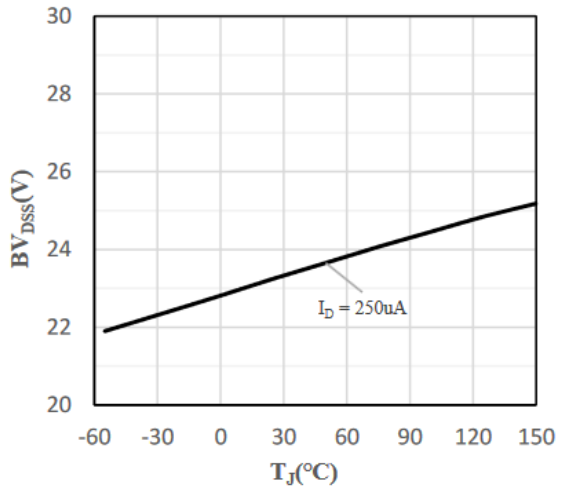


Typical characteristics

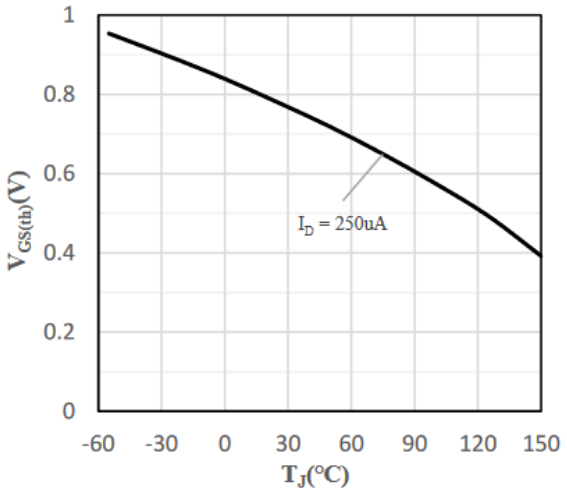
Capacitance characteristics



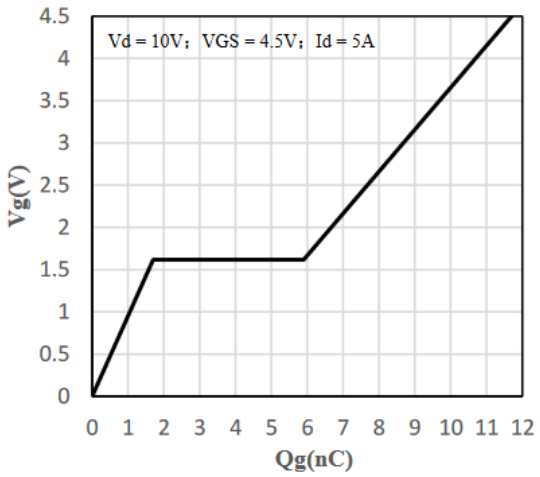
Drain-source vs. Junction temperature



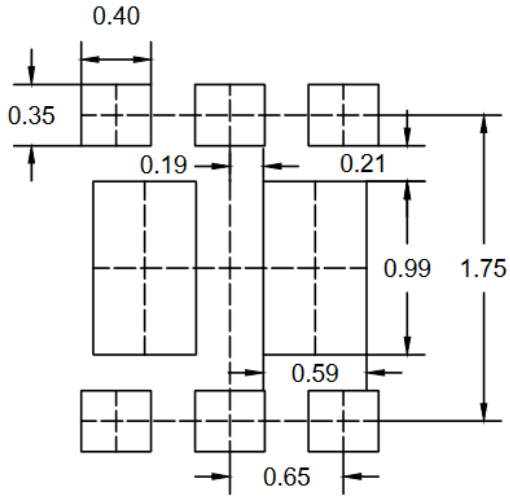
Gate voltage vs. junction temperature



Gate charge characteristics



Suggested soldering pad layout



DFN2020-6L

Ordering information

Part Number	Marking	Package	Shipping Quantity	Dimensions
AKS2312DF1	2312	DFN2020-6L	**3000 pcs / tape & reel**	---

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