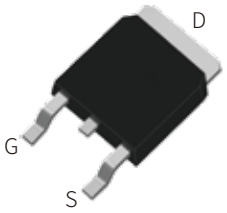
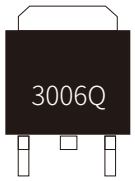
FEATURES

- Low $R_{DS(ON)}$ to minimize conductive loss
- High GOX reliability
- Low Thermal resistance
- Meet AEC-Q101 Requirements



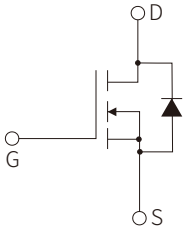
TO-252



Marking

APPLICATION

- BLDC Motor driver
- DC-DC
- Load Switch



Schematic Symbol

APPROVALS

RoHS	Compliance with 2011/65/EU
HF	Compliance with IEC61249-2-21:2003

ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage ①		V_{GS}	±20	V
Drain Current - Continuous	T_C=25°C	I_D	38	A
	T_C=75°C		31	A
	T_C=100°C		27	A
Pulsed Drain Current Pulsed; tp ⩽ 10 µs; Tmb = 25 °C		I_{DM}	152	A
Total Power Dissipation	T_C=25°C	P_D	71	W
	T_A=25°C		2.4	W
Single Pulse Avalanche Energy L=0.1mH, V_{GS}=10V, Rg=25Ω,		E_{AS}	27	mJ
Single Pulse Avalanche Energy L=0.5mH, V_{GS}=10V, Rg=25Ω			57	mJ
Thermal resistance, junction - case		R_{thJC}	2.1	°C/W
Thermal resistance, junction-ambient ②		R_{thJA}	62	°C/W
Operating Junction and Storage Temperature Range		T_J,T_{STG}	-55 to 175	°C

ELECTRICAL CHARACTERISTICS (Ta=25°C)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=250μA	60			V
Gate- Source Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V			100	nA
Drain-Source Leakage Current	I_{DSS}	V_{DS}=60V,V_{GS}=0V			1.0	uA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	1.3	1.8	2.5	V
Forward Transconductance	g_{FS}	V_{DS}=5V,I_{SD}=10A		12		S
Static Drain-source On Resistance	$R_{DS(on)}$	V_{GS}=10V,I_{DS}=10A		22	25	mΩ
Diode Forward Voltage	V_{FSD}	V_{GS}=0V,I_{SD}=16A			1.3	V
Input Capacitance	C_{iss}	V_{DS}=25V,f=1MHz		1690		pF
Output Capacitance	C_{oss}			121		pF
Reverse Transfer Capacitance	C_{rss}			91		pF
Gate resistance	R_g	f=1.0MHz		1.4		Ω
Turn–on Delay Time	$t_{d(on)}$	V_{DS}=15V,R_G=3.3Ω V_{GS}=10V,I_D=20A		18		ns
Turn–on Rise Time	t_r			9		ns
Turn–Off Delay Time	$t_{d(off)}$			26		ns
Turn–off Fall Time	t_f			6		ns
Total Gate Charge	Q_g	V_{DD}=15V,I_D=20A V_{GS}=10V		26		nC
	$Q_{g(4.5V)}$			12		nC
Gate-Source Charge	Q_{gs}			5.8		nC
Gate-Drain Charge	Q_{gd}			5.9		nC
Reverse Recovery Time	t_{rr}	V_{DD}=20V, dI_S/dt =100A/us, I_S=20A		36		ns
Reverse Recovery Charge	Q_{rr}			32		nC

Note:

① Pulse : V_{GS}=+20V/-20V, Duty cycle=50%,T_j=175°C, t=1000 hours; For DC , the following test conditions can be passed: V_{GS}=+20V/-10V, T_j=175°C, t=1000 hours;

② Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate;

③Practically the current will be limited by PCB, thermal design and operating temperature. V_{GS}=10V

PARAMETER CHARACTERISTIC CURVE

Figure 1: Gate-Charge Characteristics

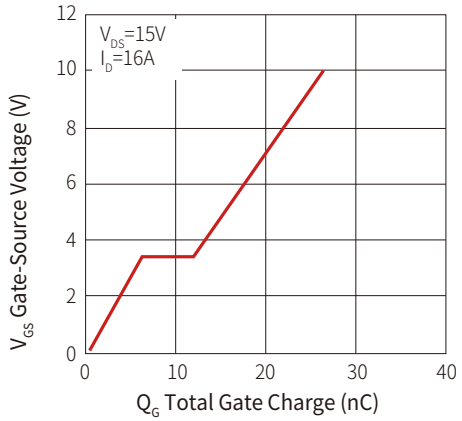


Figure 2: Capacitance Characteristics

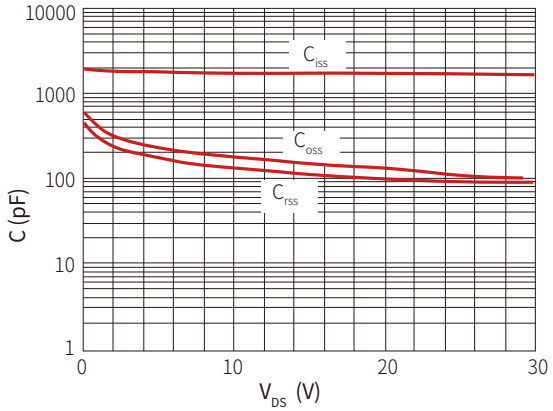


Figure 3: Power Dissipation

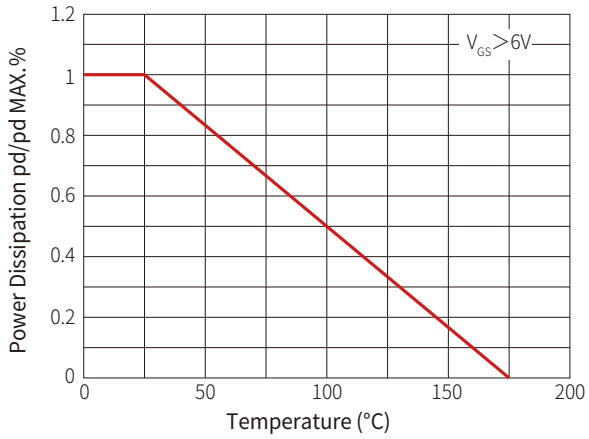


Figure 4: Typical output Characteristics

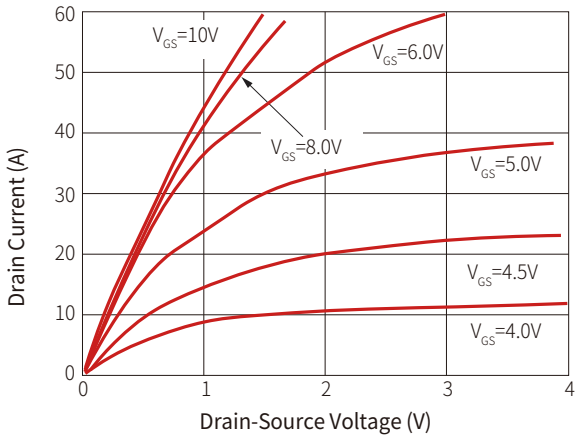


Figure 5: Threshold Voltage V.S Junction Temperature

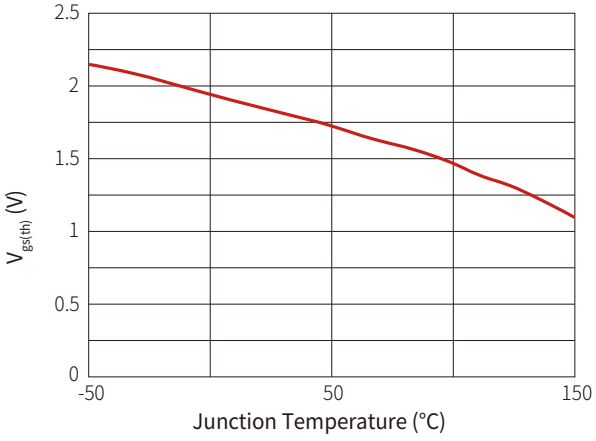


Figure 6: Resistance V.S Drain Current

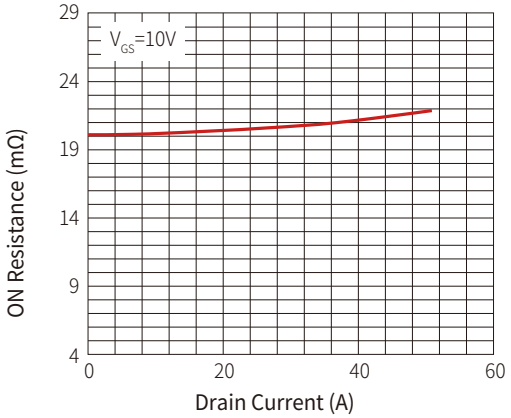


Figure 7: On-Resistance VS Gate Source Voltage

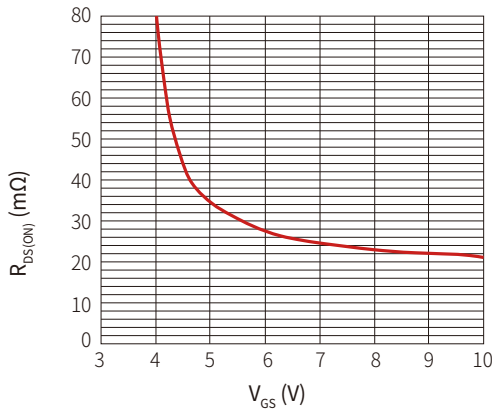


Figure 8: On-Resistance V.S Junction Temperature

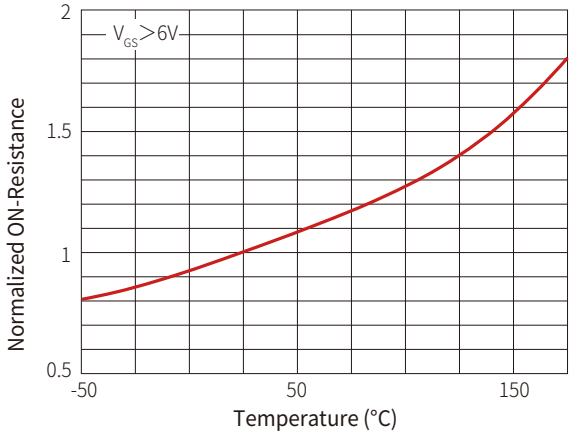


Figure 9: Diode Forward Voltage vs. Current

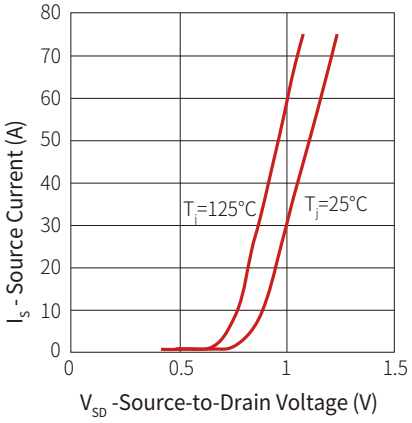


Figure 10: Transfer Characteristics

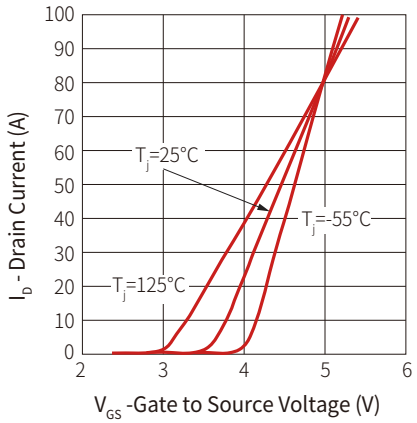


Figure 11: Safe Operating Area

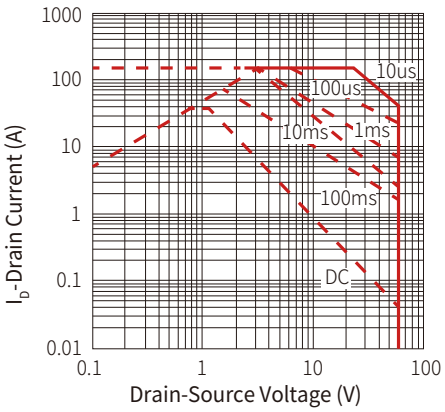
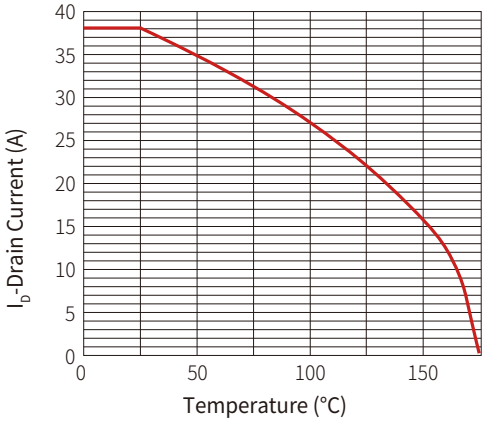
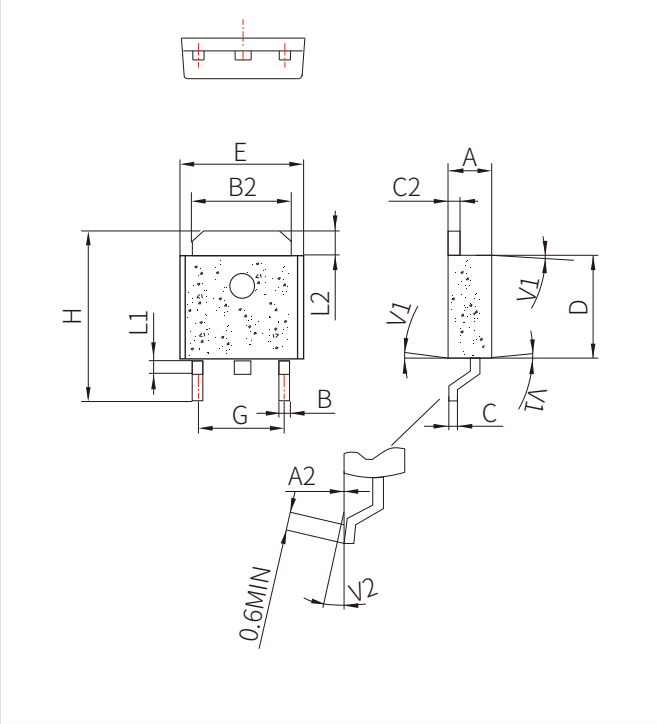


Figure 12: I_D vs. Case Temperature③



TO-252 PACKAGE MECHANICAL DATA



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0.03		0.23	0.001		0.009
B	0.55		0.65	0.022		0.026
B2	5.10		5.40	0.200		0.213
C	0.45		0.62	0.018		0.024
C2	0.48		0.62	0.019		0.024
D	6.00		6.20	0.236		0.244
E	6.40		6.80	0.252		0.268
G	4.40		4.70	0.173	0.1	0.185
H	9.35		10.7	0.368		0.421
L1	1.30		1.70	0.051	0.143	0.067
L2	1.37		1.50	0.054		0.059
V1		4°			0.130	
V2	0°		8°	0°		8°

ORDERING INFORMATION

Part Number	Component Package	QTY/Reel	Reel Size
SNM30N06Q	TO-252	2500PCS	13”

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