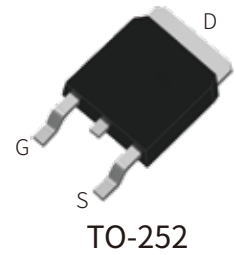


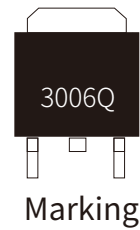
## FEATURES

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



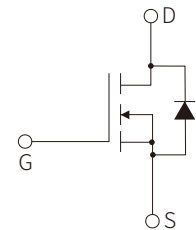
## APPLICATION

- | BLDC Motor driver
- | DC-DC
- | Load Switch



## APPROVALS

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



**Schematic Symbol**

## ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage <sup>①</sup>	$V_{GS}$	±20	V
Drain Current - Continuous	$I_D$	$T_C=25^{\circ}\text{C}$	38
		$T_C=75^{\circ}\text{C}$	31
		$T_C=100^{\circ}\text{C}$	27
Pulsed Drain Current Pulsed; $t_p \leq 10 \mu\text{s}$ ; $T_{mb} = 25^{\circ}\text{C}$		$I_{DM}$	152
Total Power Dissipation	$P_D$	$T_C=25^{\circ}\text{C}$	71
		$T_A=25^{\circ}\text{C}$	2.4
Single Pulse Avalanche Energy $L=0.1\text{mH}$ , $V_{GS}=10\text{V}$ , $R_g=25\Omega$ ,	$E_{AS}$	27	mJ
Single Pulse Avalanche Energy $L=0.5\text{mH}$ , $V_{GS}=10\text{V}$ , $R_g=25\Omega$		57	mJ
Thermal resistance, junction - case	$R_{thJC}$	2.1	$^{\circ}\text{C}/\text{W}$
Thermal resistance, junction-ambient <sup>②</sup>	$R_{thJA}$	62	$^{\circ}\text{C}/\text{W}$
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 175	$^{\circ}\text{C}$

## ELECTRICAL CHARACTERISTICS (Ta=25°C )

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	60			V
Gate- Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$			100	nA
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=60V, V_{GS}=0V$			1.0	$\mu A$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	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	m $\Omega$
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		$\Omega$
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=15V, R_g=3.3\Omega$ $V_{GS}=10V, I_D=20A$		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	$t_{rr}$		$V_{DD}=20V, dI_g/dt=100A/\mu s,$ $I_S=20A$		36	
Reverse Recovery Charge	$Q_{rr}$			32		nC

Note:

- ① Pulse :  $V_{GS}=\pm 20V/-20V$ , Duty cycle=50%,  $T_j=175^\circ C$ ,  $t=1000$  hours; For DC , the following test conditions can be passed:  $V_{GS}=\pm 20V/-10V$ ,  $T_j=175^\circ C$ ,  $t=1000$  hours ;
- ② Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate ;
- ③ Practically the current will be limited by PCB, thermal design and operating temperature.  $V_{GS}=10V$

# PARAMETER CHARACTERISTIC CURVE

Figure 1: Gate-Charge Characteristics

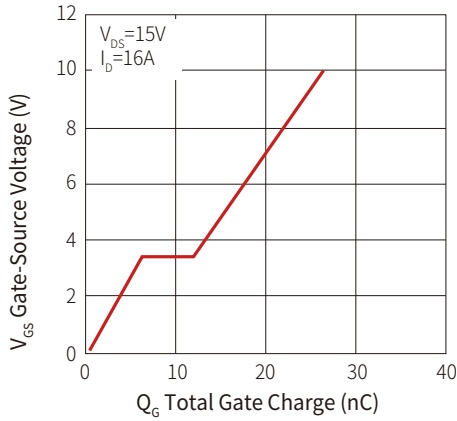


Figure 2: Capacitance Characteristics

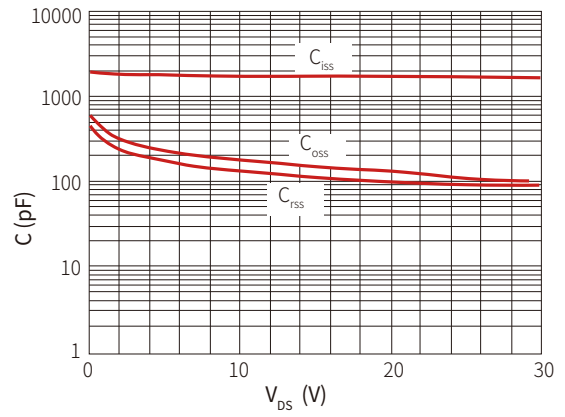


Figure 3: Power Dissipation

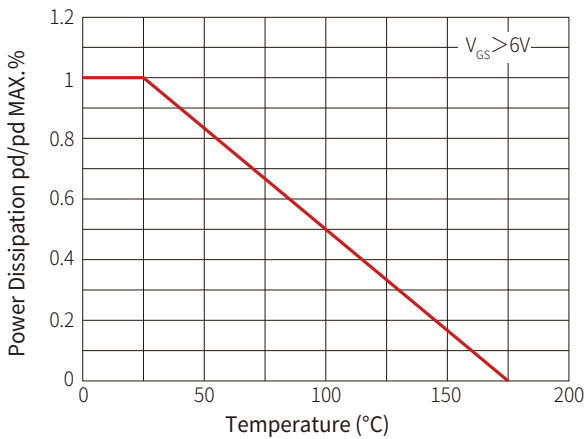


Figure 4: Typical output Characteristics

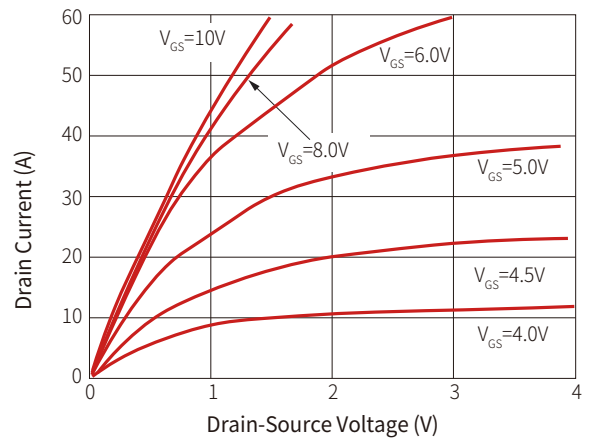


Figure 5: Threshold Voltage V.S Junction Temperature

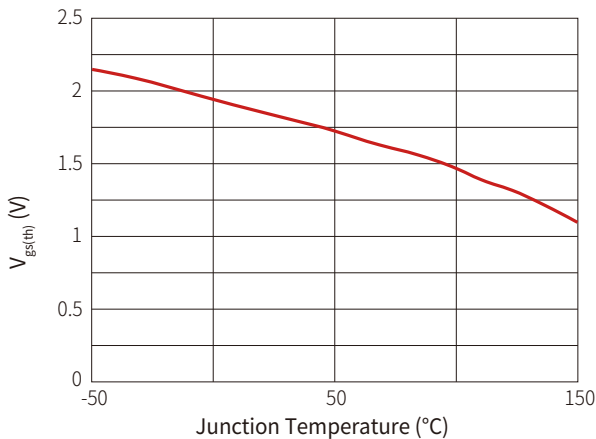
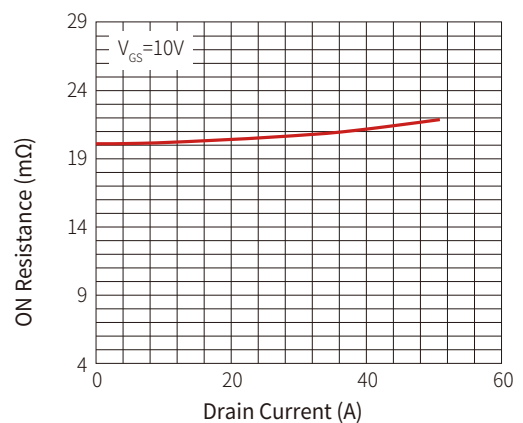
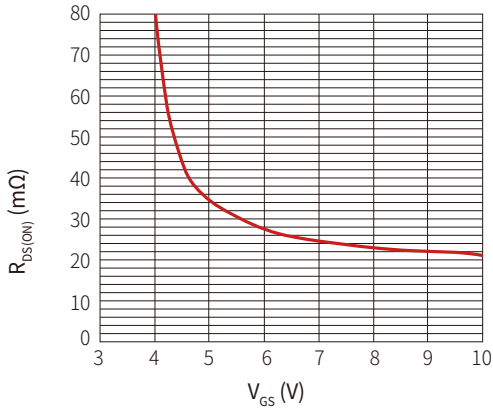


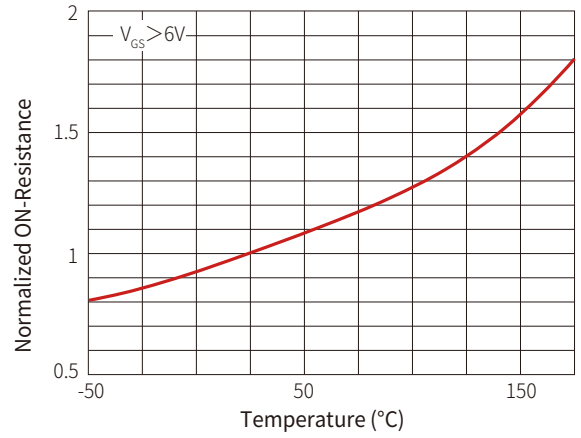
Figure 6: Resistance V.S Drain Current



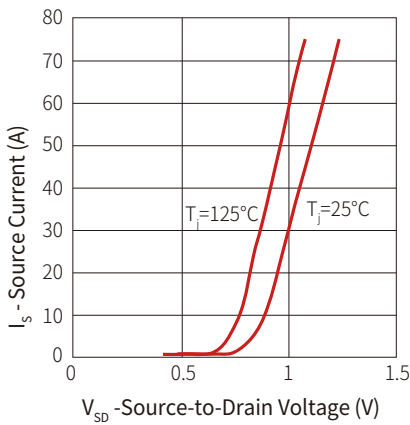
**Figure 7: On-Resistance VS Gate Source Voltage**



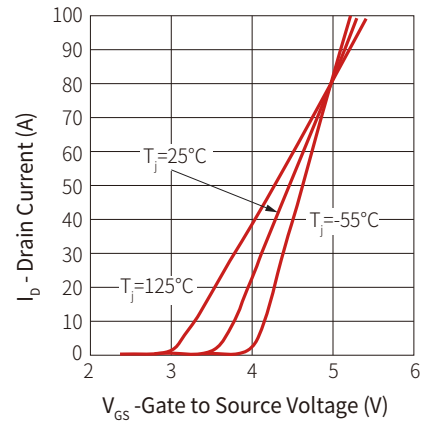
**Figure 8: On-Resistance V.S Junction Temperature**



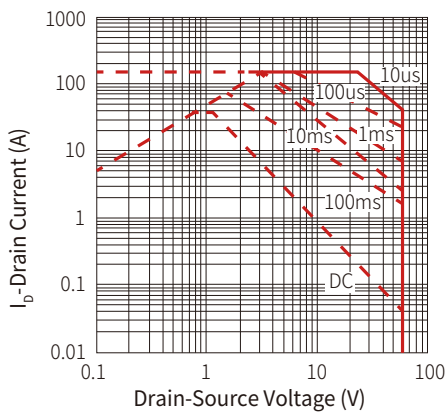
**Figure 9: Diode Forward Voltage vs. Current**



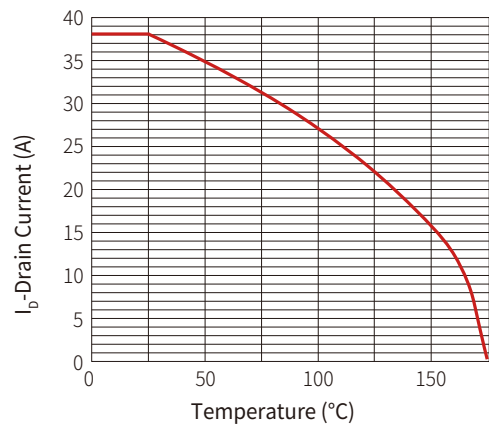
**Figure 10: Transfer Characteristics**



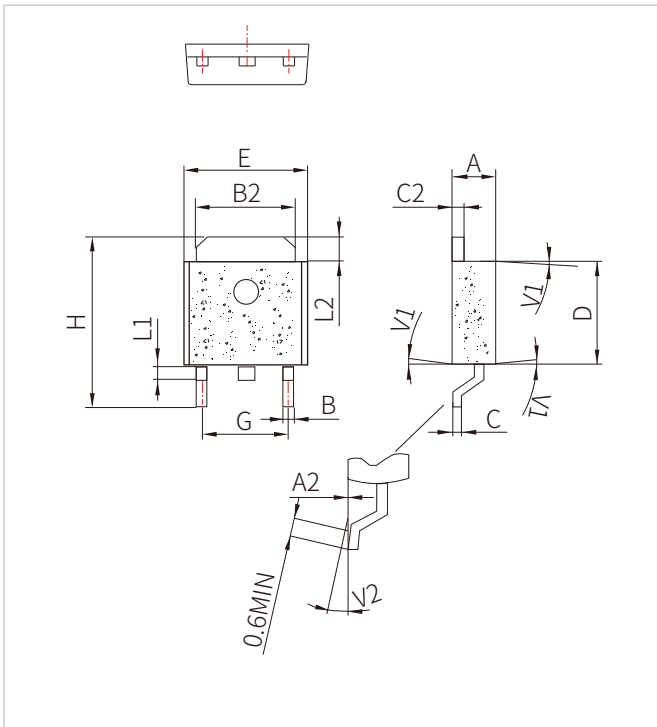
**Figure 11: Safe Operating Area**



**Figure 12:  $I_D$  vs. Case Temperature<sup>③</sup>**



## 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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