

## General Description

The MY20N06A is the high cell density trenched N-CH MOSFETs, which provide excellent  $R_{DS(ON)}$  and gate charge for most of the synchronous buck converter applications.

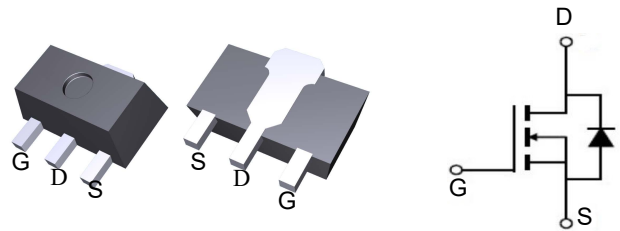


## Features

$V_{DSS}$	60	V
$I_D$	20	A
$R_{DS(ON)}$ (at $V_{GS}=10V$ )	<35	m $\Omega$
$R_{DS(ON)}$ (at $V_{GS}=4.5V$ )	<40	m $\Omega$

## Application

- Super Low Gate Charge
- 100% EAS Guaranteed
- Green Device Available
- Excellent CdV/dt effect decline
- Advanced high cell density Trench



## Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
MY20N06A	SOT-89	MY20N06A	1000

## Absolute Maximum Ratings ( $T_C=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Max.	Units
$V_{DSS}$	Drain-Source Voltage	60	V
$V_{GSS}$	Gate-Source Voltage	$\pm 30$	V
$I_D$	$T_C = 25^\circ\text{C}$	20	A
	$T_C = 100^\circ\text{C}$	14	A
$I_{DM}$	Pulsed Drain Current <sup>note1</sup>	80	A
EAS	Single Pulsed Avalanche Energy <sup>note2</sup>	72	mJ
$P_D$	Power Dissipation $T_C = 25^\circ\text{C}$	45.7	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case	50	$^\circ\text{C}/\text{W}$
$T_J, T_{STG}$	Operating and Storage Temperature Range	-55 to +175	$^\circ\text{C}$

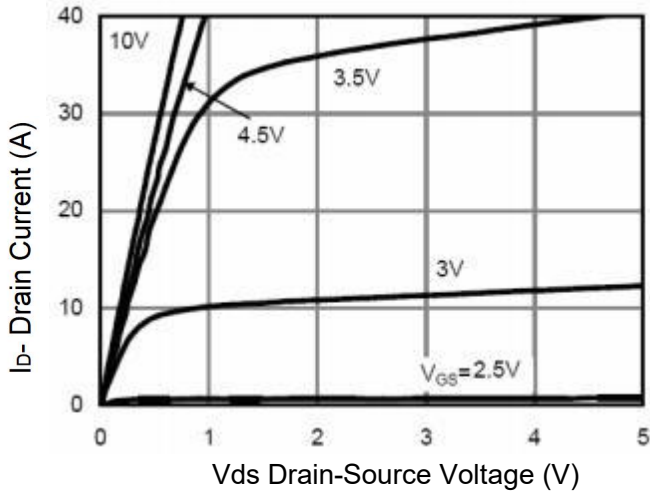
**Electrical Characteristics** at  $T_J=25\text{ }^\circ\text{C}$  unless otherwise specified

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	60	-	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=60V, V_{GS}=0V$	-	-	1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
<b>On Characteristics</b> (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	1.6	2.5	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=10A$	-	24	35	m $\Omega$
		$V_{GS}=4.5V, I_D=8A$	-	30	40	
Forward Transconductance	$g_{FS}$	$V_{DS}=5V, I_D=10A$	11	-	-	S
<b>Dynamic Characteristics</b> (Note 4)						
Input Capacitance	$C_{iss}$	$V_{DS}=30V, V_{GS}=0V,$ $F=1.0MHz$	-	973.2	-	PF
Output Capacitance	$C_{oss}$		-	61.2	-	PF
Reverse Transfer Capacitance	$C_{rss}$		-	58.8	-	PF
<b>Switching Characteristics</b> (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=30V, R_L=3\Omega$ $V_{GS}=10V, R_G=3\Omega$	-	7	-	nS
Turn-on Rise Time	$t_r$		-	20	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	16	-	nS
Turn-Off Fall Time	$t_f$		-	23	-	nS
Total Gate Charge	$Q_g$	$V_{DS}=30V, I_D=10A,$ $V_{GS}=10V$	-	25	-	nC
Gate-Source Charge	$Q_{gs}$		-	4.5	-	nC
Gate-Drain Charge	$Q_{gd}$		-	6.5	-	nC
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage (Note 3)	$V_{SD}$	$V_{GS}=0V, I_S=10A$	-	-	1.2	V
Diode Forward Current (Note 2)	$I_S$		-	-	20	A
Reverse Recovery Time	$t_{rr}$	$T_J = 25^\circ\text{C}, I_F = 10A$ $di/dt =$ $100A/\mu s$ (Note 3)	-	29	-	nS
Reverse Recovery Charge	$Q_{rr}$		-	49	-	nC
Forward Turn-On Time	$t_{on}$	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

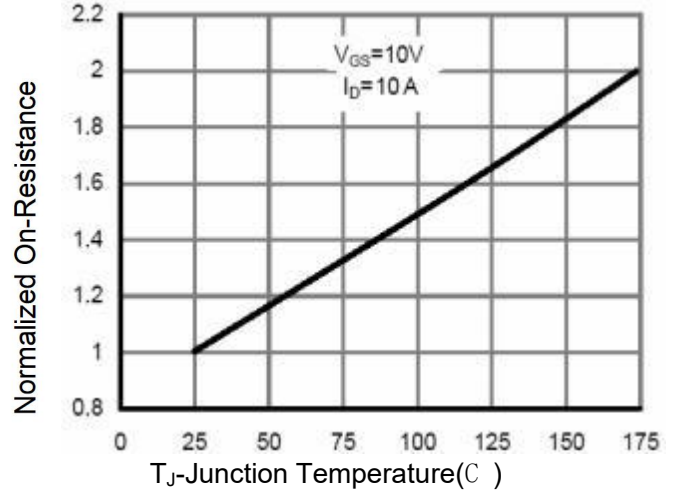
**Notes:**

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production
5. EAS condition:  $T_J=25^\circ\text{C}$ ,  $V_{DD}=30V, V_G=10V, L=0.5mH, R_g=25\Omega$

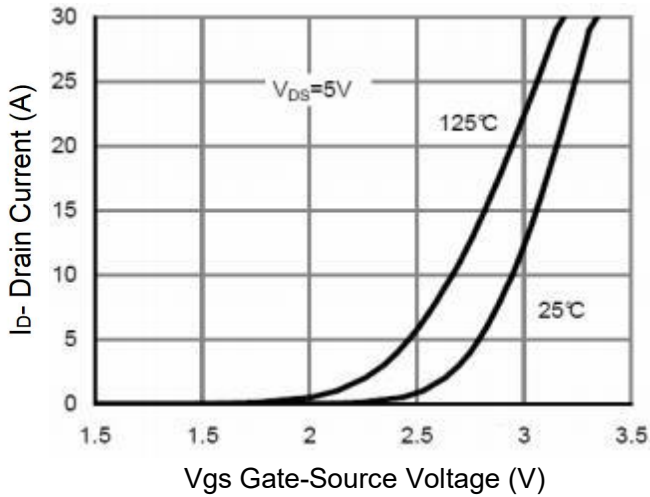
**Typical Characteristics**



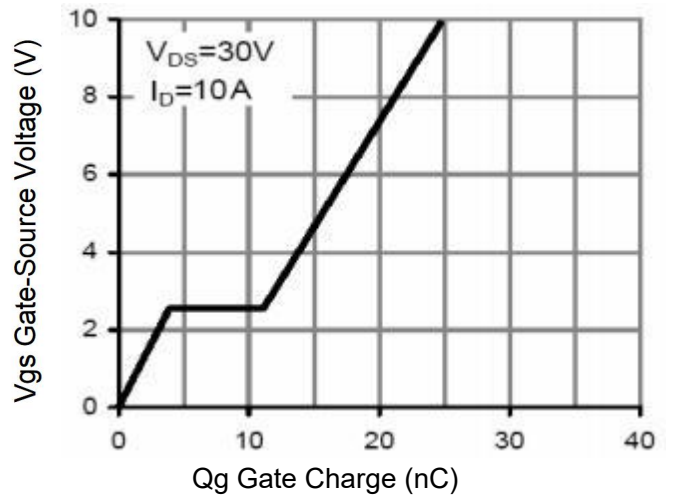
**Figure 1 Output Characteristics**



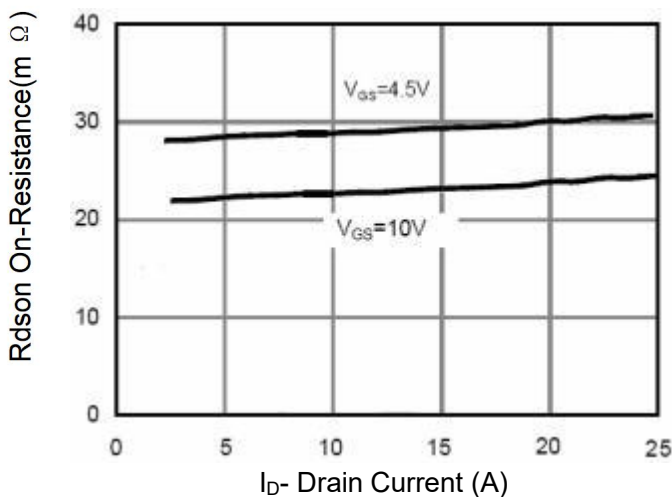
**Figure 4 Rdson-Junction Temperature**



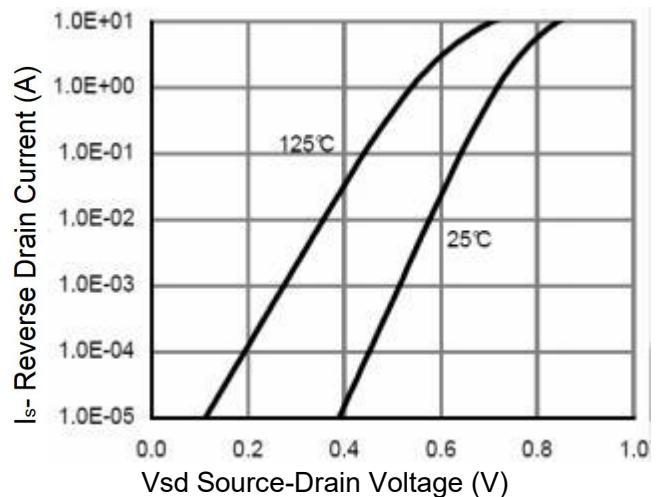
**Figure 2 Transfer Characteristics**



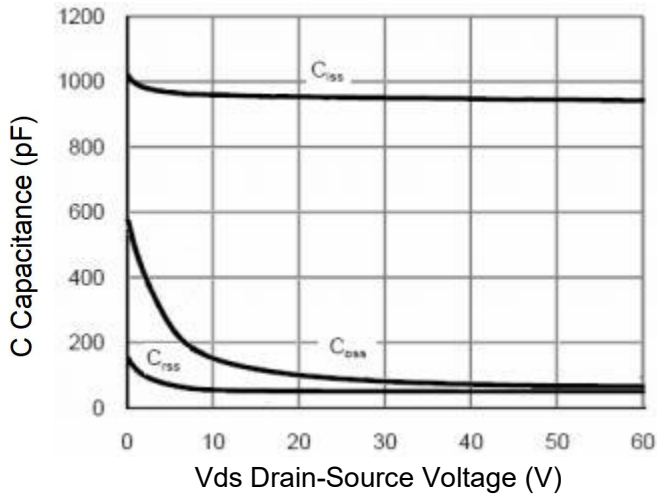
**Figure 5 Gate Charge**



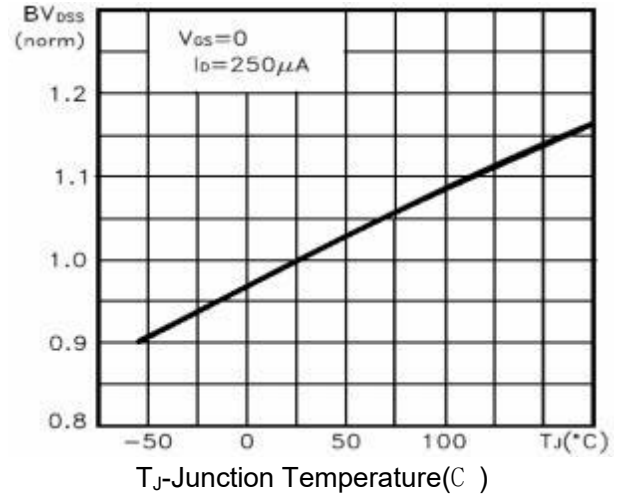
**Figure 3 Rdson- Drain Current**



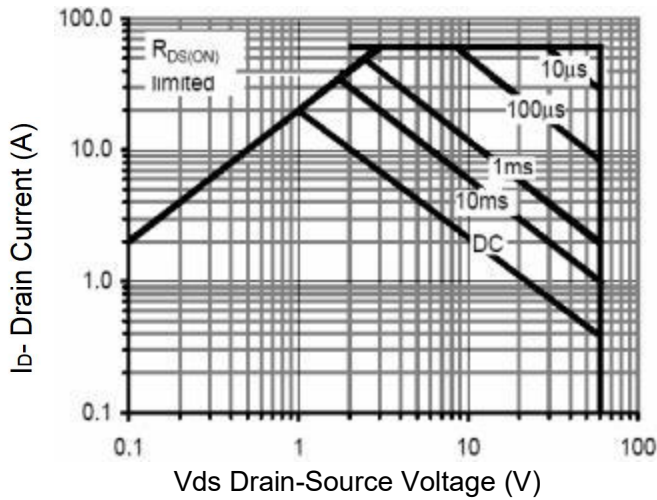
**Figure 6 Source- Drain Diode Forward**



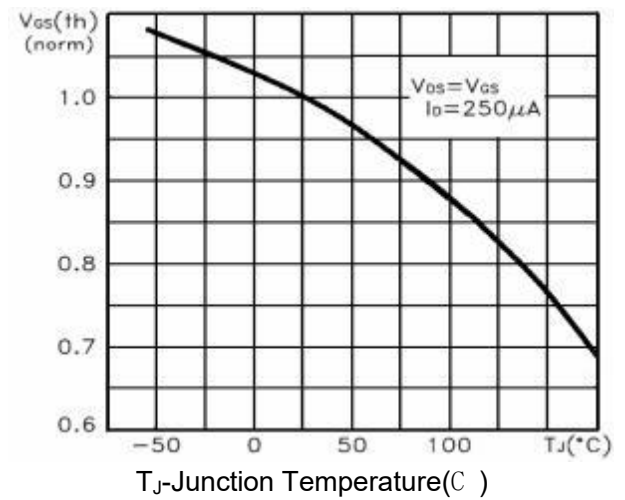
**Figure 7 Capacitance vs Vds**



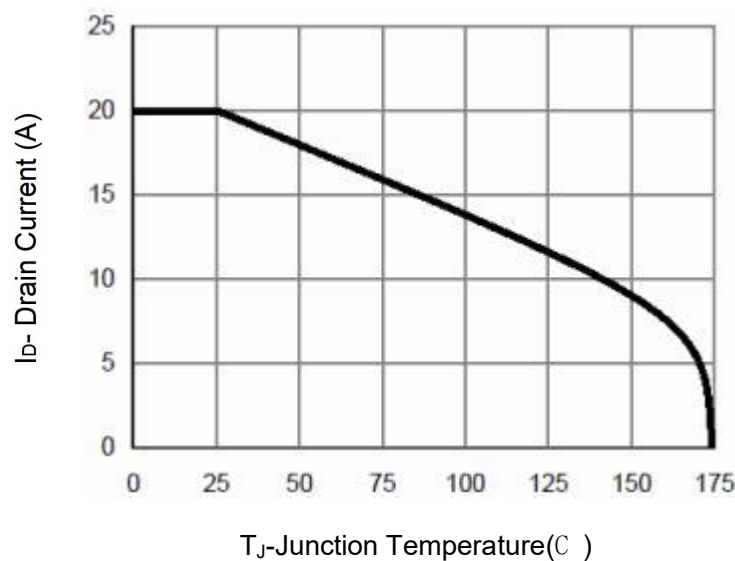
**Figure 9  $BV_{DSS}$  vs Junction Temperature**



**Figure 8 Safe Operation Area**

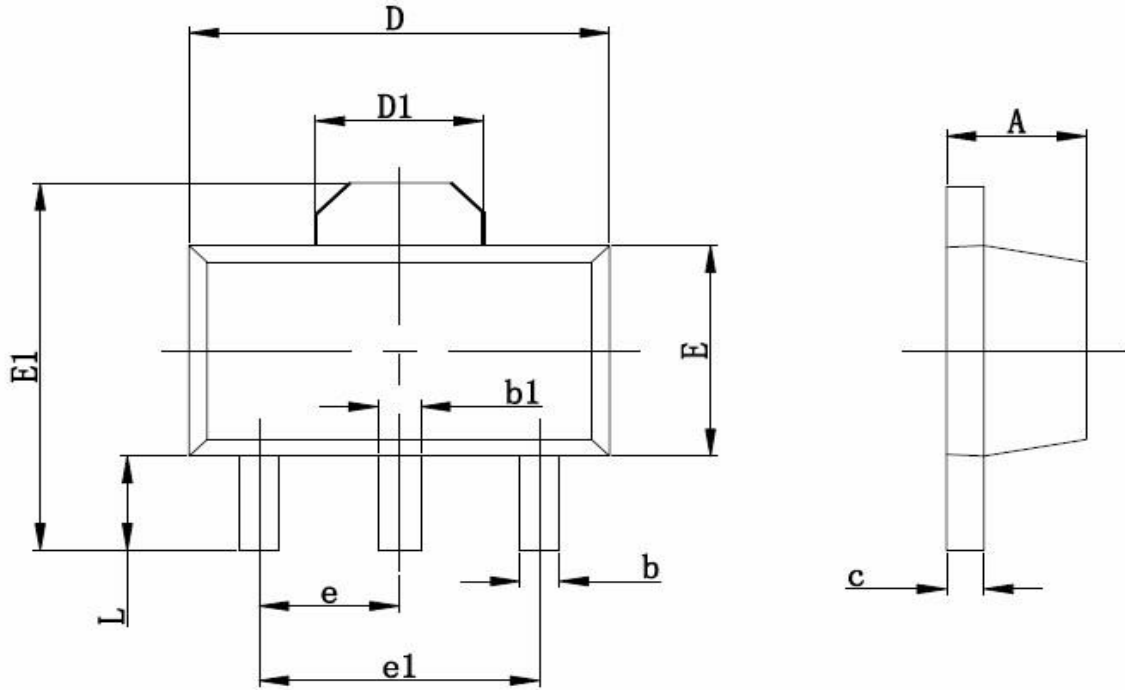


**Figure 10  $V_{GS(th)}$  vs Junction Temperature**



**Figure 11 Current De-rating**

**Package Mechanical Data SOT-89**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.350	0.520	0.013	0.197
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
E	2.350	2.550	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP		0.060TYP	
e1	3.000 TYP		0.118TYP	
L	0.900	1.100	0.035	0.047