

General Description

The MY80N02D uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

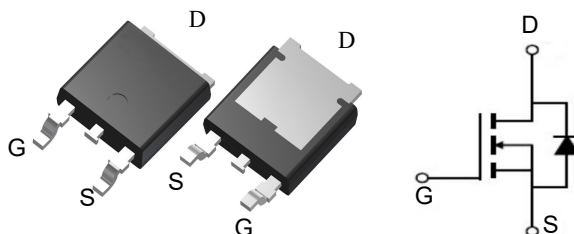


Features

V_{DSS}	20	V
I_D	80	A
$R_{DS(ON)}(at V_{GS}=10V)$	4.5	$m\Omega$
$R_{DS(ON)}(at V_{GS}=4.5V)$	6.3	$m\Omega$

Application

- Battery protection
- Load switch
- Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
MY80N02D	TO-252-2L	MY80N02D	2500

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate- Source Voltage	± 12	V
$I_D @ T_c=25^{\circ}C$	Continuous Drain Current, $V_{GS} @ 10V^1$	80	A
$I_D @ T_c=100^{\circ}C$	Continuous Drain Current, $V_{GS} @ 10V^1$	42	A
I_{DM}	Pulsed Drain Current ²	210	A
EAS	Single Pulse Avalanche Energy ³	200	mJ
$P_D @ T_c=25^{\circ}C$	Total Power Dissipation ⁴	60	W
T_{STG}	Storage Temperature Range	-55 to 150	$^{\circ}C$
T_J	Operating Junction Temperature Range	-55 to 150	$^{\circ}C$
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹		
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	2.1	$^{\circ}C/W$

Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	20	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V$	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 12V, V_{DS}=0V$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.5	0.75	1.0	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=20A$	-	4.5	6.0	m Ω
		$V_{GS}=2.5V, I_D=15A$	-	6.3	8.5	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=10V, I_D=20A$	15	-	-	S
Input Capacitance	C_{iss}	$V_{DS}=10V, V_{GS}=0V,$ $F=1.0MHz$	-	2000	-	PF
Output Capacitance	C_{oss}		-	500	-	PF
Reverse Transfer Capacitance	C_{rss}		-	200	-	PF
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=10V, I_D=2A, R_L=1\Omega$ $V_{GS}=4.5V, R_G=3\Omega$	-	6.4	-	nS
Turn-on Rise Time	t_r		-	17.2	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	29.6	-	nS
Turn-Off Fall Time	t_f		-	16.8	-	nS
Total Gate Charge	Q_g	$V_{DS}=10V, I_D=20A,$ $V_{GS}=10V$	-	27	-	nC
Gate-Source Charge	Q_{gs}		-	6.5	-	nC
Gate-Drain Charge	Q_{gd}		-	6.4	-	nC
Diode Forward Voltage (Note 3)	V_{SD}	$V_{GS}=0V, I_S=10A$	-	-	1.2	V
Diode Forward Current (Note 2)	I_S		-	-	60	A
Reverse Recovery Time	t_{rr}	$T_J = 25^\circ\text{C}, I_F = 20A$ $di/dt = 100A/\mu s$ (Note 3)	-	25	-	nS
Reverse Recovery Charge	Q_{rr}		-	24	-	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 : $T_J=25^\circ\text{C}, V_{DD}=10V, V_G=10V, L=0.5mH, R_G=25\Omega,$

Typical Characteristics

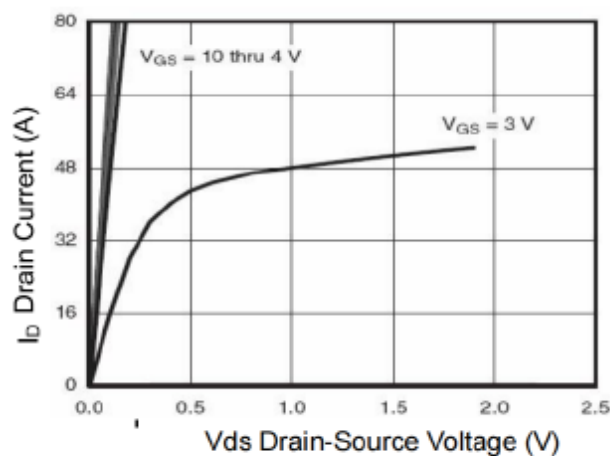


Figure 1 Output Characteristics

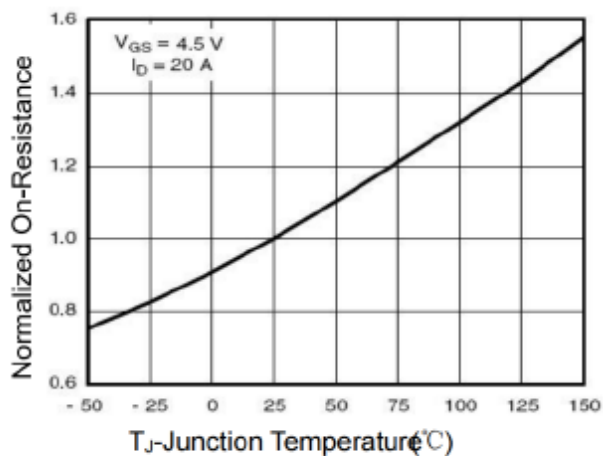


Figure 4 Rdson-Junction Temperature

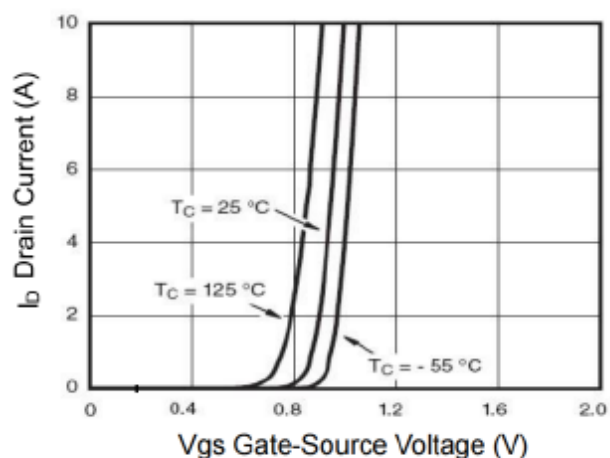


Figure 2 Transfer Characteristics

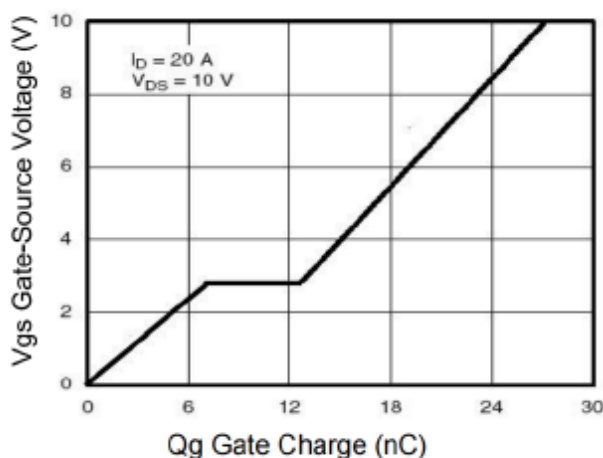


Figure 5 Gate Charge

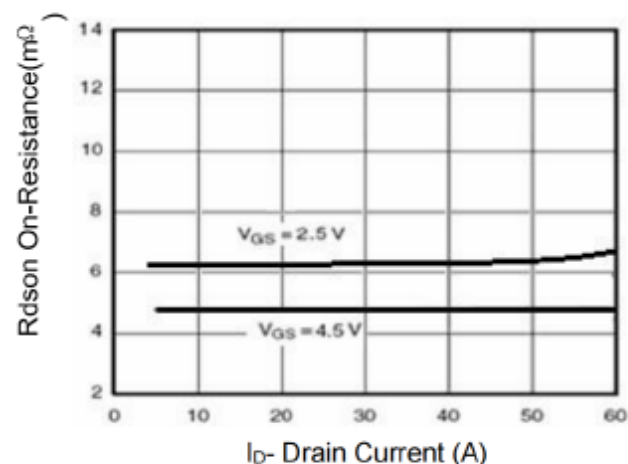


Figure 3 Rdson- Drain Current

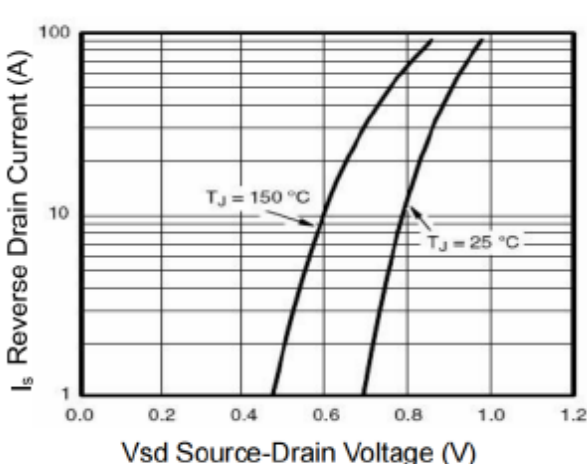


Figure 6 Source- Drain Diode Forward

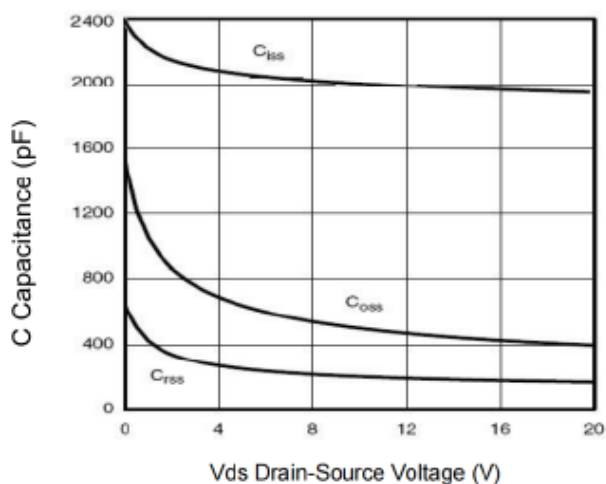


Figure 7 Capacitance vs Vds

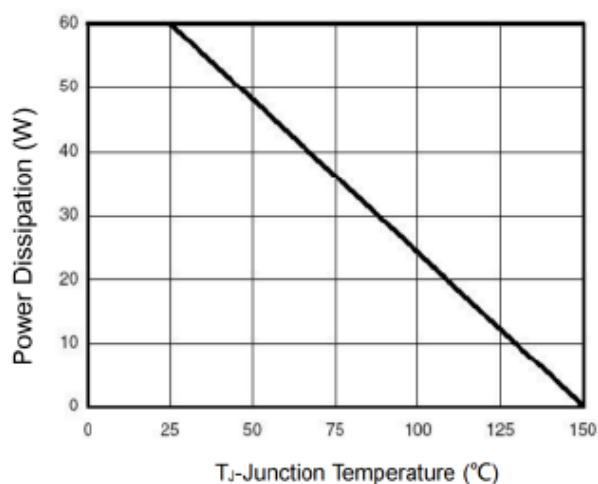


Figure 9 Power De-rating

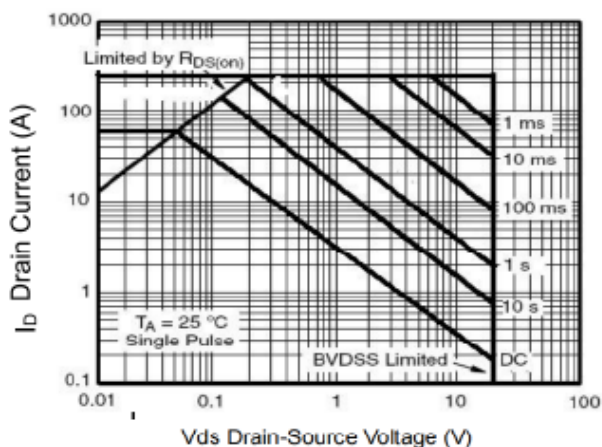


Figure 8 Safe Operation Area

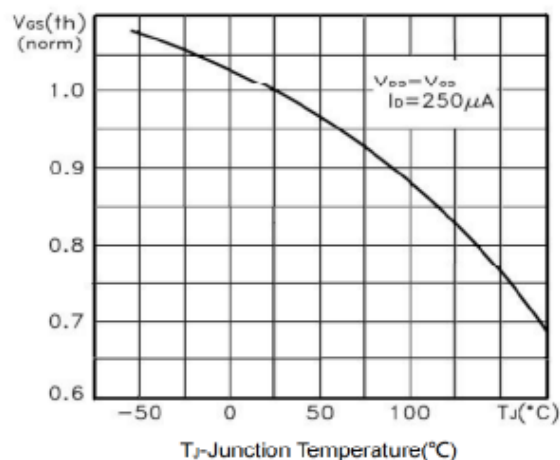


Figure 10 $V_{GS(th)}$ vs Junction Temperature

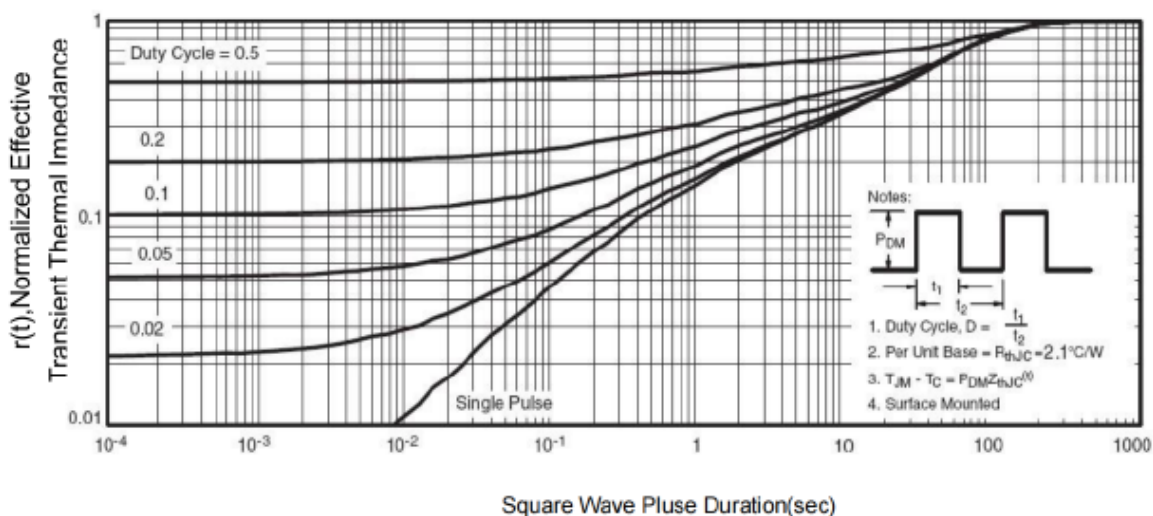
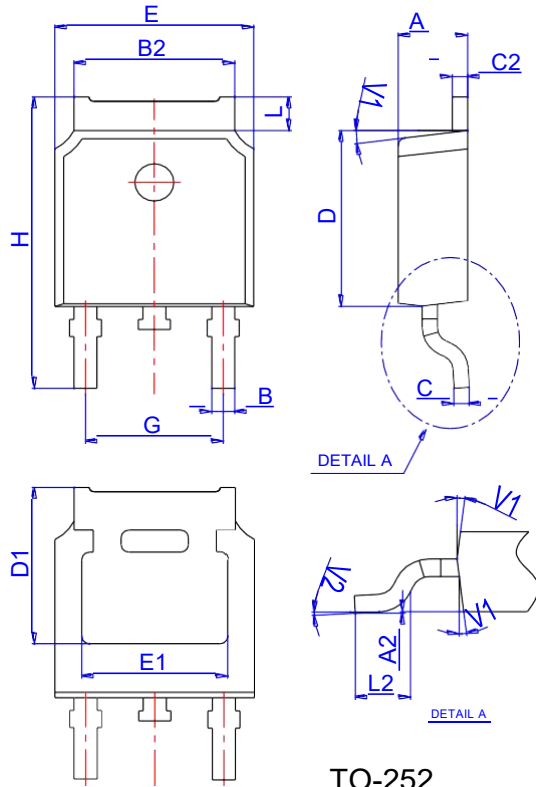


Figure 11 Normalized Maximum Transient Thermal Impedance

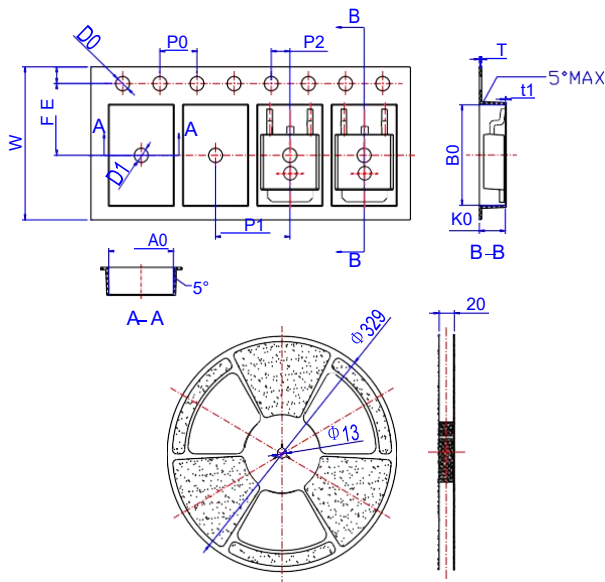
Package Mechanical Data TO-252



TO-252

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Reel Specification-TO-252



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
W	15.90	16.00	16.10	0.626	0.630	0.634
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
D0	1.40	1.50	1.60	0.055	0.059	0.063
D1	1.40	1.50	1.60	0.055	0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.90	2.00	2.10	0.075	0.079	0.083
A0	6.85	6.90	7.00	0.270	0.271	0.276
B0	10.45	10.50	10.60	0.411	0.413	0.417
K0	2.68	2.78	2.88	0.105	0.109	0.113
T	0.24		0.27	0.009		0.011
t1	0.10			0.004		
10P0	39.80	40.00	40.20	1.567	1.575	1.583