

General Description

The MY20P04D 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.

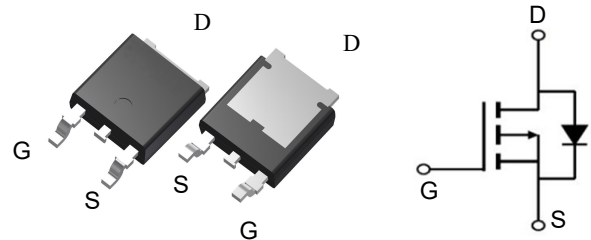


Features

V_{DSS}	-40	V
I_D	-20	A
$R_{DS(ON)}(at V_{GS} = -10V)$	28	m Ω
$R_{DS(ON)}(at V_{GS} = -4.5V)$	33	m Ω

Application

- Battery protection
- Load switch
- Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
MY20P04D	TO-252-2L	MY20P04D	2500

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

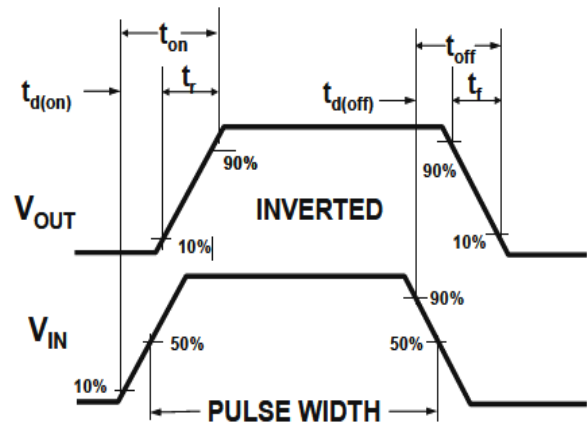
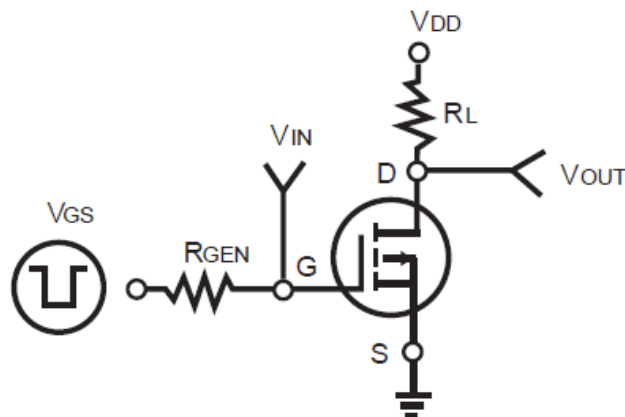
Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage ($V_{GS}=0V$)	-40	V
V_{GS}	Gate-Source Voltage ($V_{DS}=0V$)	± 20	V
I_D	Drain Current-Continuous($T_C=25^\circ\text{C}$)	-20	A
	Drain Current-Continuous($T_C=100^\circ\text{C}$)	-15	A
$I_{DM} \text{ (pulse)}$	(Note 1) Drain Current-Continuous@ Current-Pulsed	-80	A
P_D	Maximum Power Dissipation($T_C=25^\circ\text{C}$)	37.5	W
	Maximum Power Dissipation($T_C=100^\circ\text{C}$)	19	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 175	$^\circ\text{C}$
R_{JC}	Thermal Resistance, Junction-to-Case	4	$^\circ\text{C/W}$

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-40			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-32V, V_{GS}=0V$			-1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1	-2	-3	V
g_{FS}	Forward Transconductance	$V_{DS}=-5V, I_D=-10A$		25		S
$R_{DS(ON)}$	Drain-Source On-State Resistance	$V_{GS}=-10V, I_D=-20A$		28	35	m Ω
		$V_{GS}=-4.5V, I_D=-10A$		33	42	m Ω
C_{iss}	Input Capacitance	$V_{DS}=-25V, V_{GS}=0V,$ $f=1.0MHz$		840		pF
C_{oss}	Output Capacitance			92		pF
C_{rss}	Reverse Transfer Capacitance			60		pF
$t_{d(on)}$	Turn-on Delay Time	$V_{GS}=-10V, V_{DS}=-20V,$ $R_L=1.6, R_{GEN}=3$		5		nS
t_r	Turn-on Rise Time			12		nS
$t_{d(off)}$	Turn-Off Delay Time			20		nS
t_f	Turn-Off Fall Time			4.5		nS
Q_g	Total Gate Charge	$V_{GS}=-10V, V_{DS}=-20V, I_D=-15A$		20		nC
Q_{gs}	Gate-Source Charge			2.5		nC
Q_{gd}	Gate-Drain Charge			4.5		nC
I_{SD}	Source-Drain Current(Body Diode)				-20	A
V_{SD}	Forward on Voltage	$V_{GS}=0V, I_S=-20A$			-1.2	V

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature

Typical Characteristics



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)

Figure1. Power Dissipation

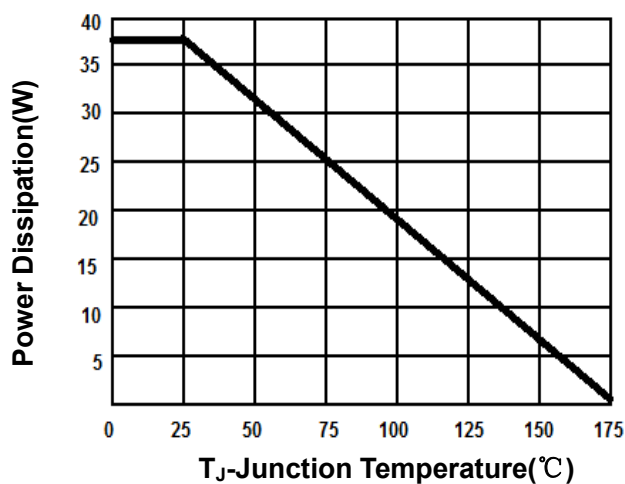


Figure2. Drain Current

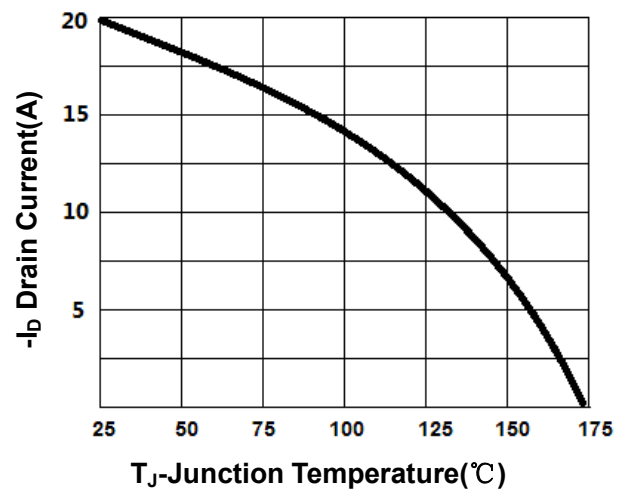


Figure3. Output Characteristics

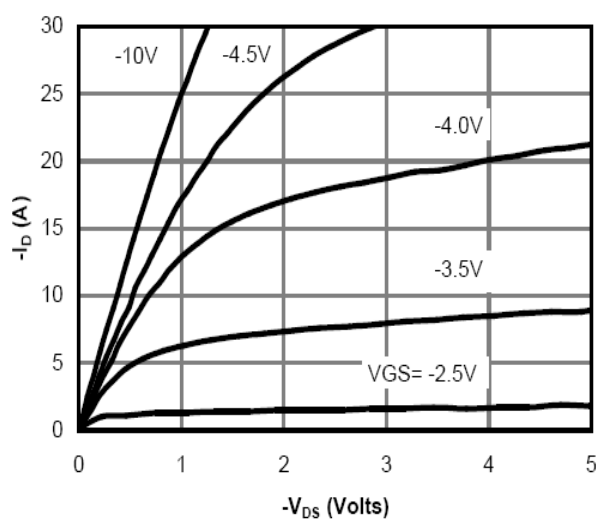


Figure4. Transfer Characteristics

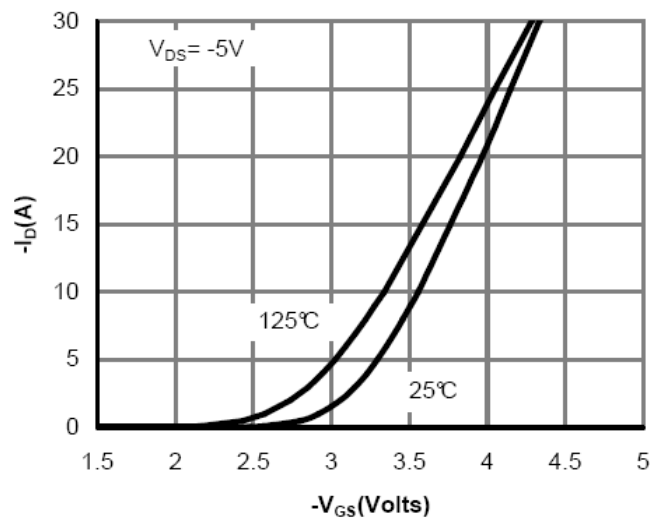


Figure5. Capacitance

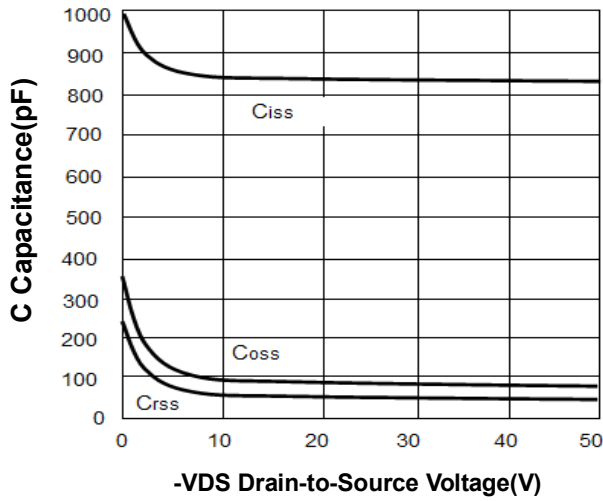


Figure6. $R_{DS(ON)}$ vs Junction Temperature

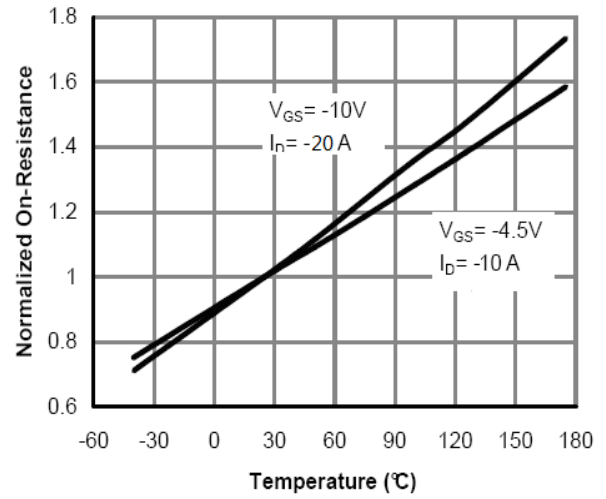


Figure7. $V_{GS(th)}$ vs Junction Temperature

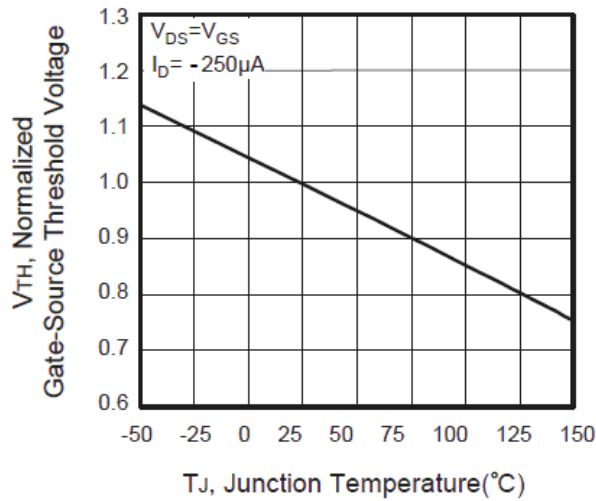


Figure8. Gate Charge Waveforms

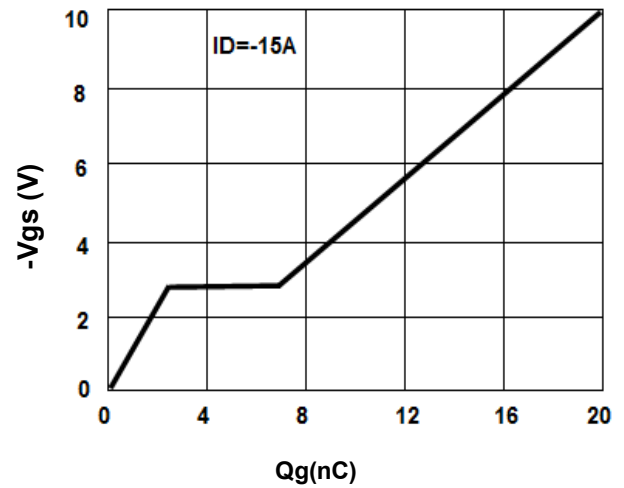
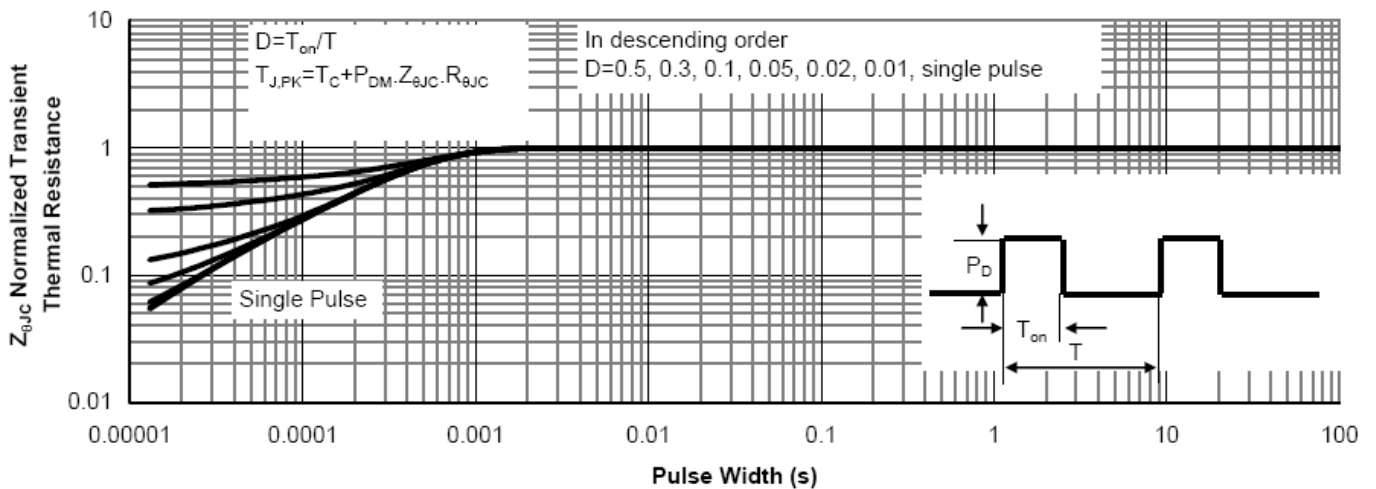
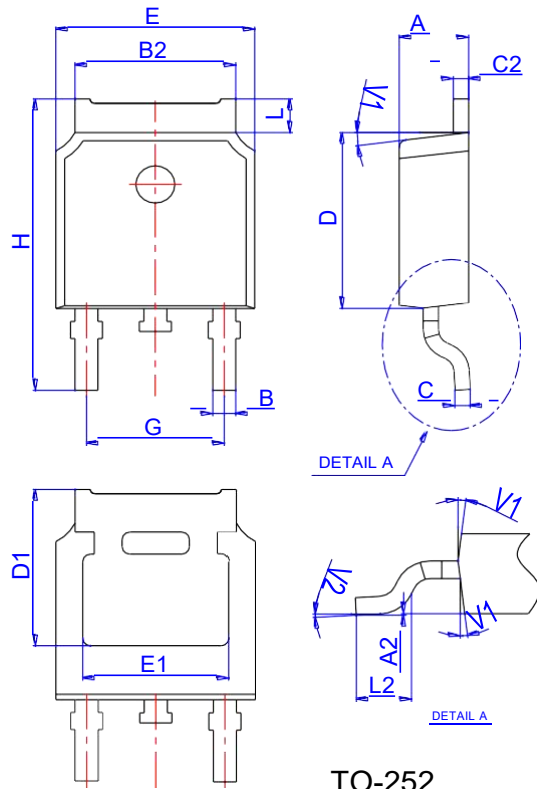


Figure9. Normalized Maximum Transient Thermal Impedance



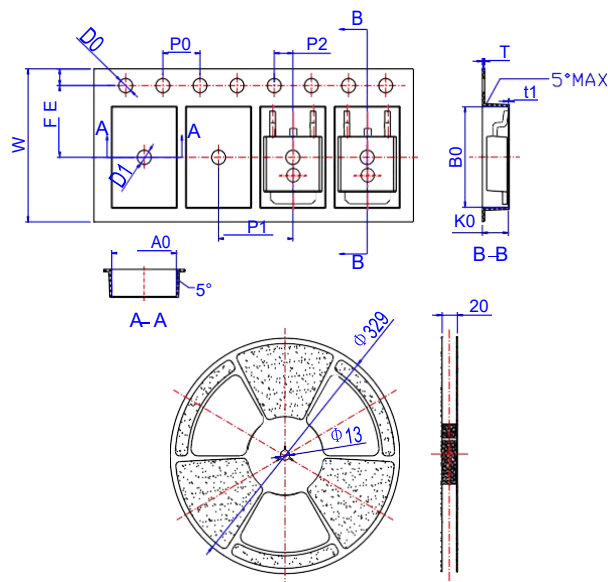
Package Mechanical Data-TO-252-JQ Single



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