General Description

The MY33N15D 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.

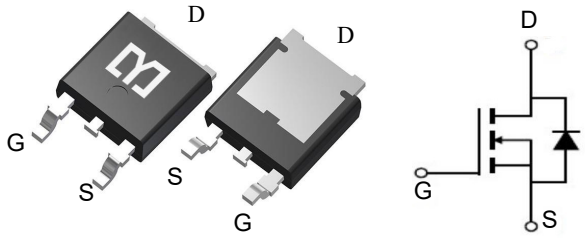
RoHS Compliant

Features

V_{DSS}	150	V
I_D	33	A
$R_{DS(ON)}$(atV_{GS}=10V)	32	mΩ
$R_{DS(ON)}$(atV_{GS}=4.5V)	33	mΩ

Application

- Battery protection
- Load switch
- Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
MY33N15D	TO-252-2L	MY33N15D	2500

Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Rating	Unit
V_{GS}	Gate-Source Voltage	±20	V
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	150	V
T_J	Maximum Junction Temperature	175	°C
T_{STG}	Storage Temperature Range	-50 to 175	°C

Mounted on Large Heat Sink

I_{DM}	Pulse Drain Current Tested①	T_C=25°C	78	A
I_S	Diode continuous forward current	T_C=25°C	33	A
I_D	Continuous Drain Current	T_C=25°C	33	A
		T_C=70°C	26.4	
P_D	Maximum Power Dissipation	T_C=25°C	75	W
EAS	Avalanche energy, single pulsed ②		117.6	mJ
$R_{\theta JC}$	Thermal Resistance-Junction to Case		2	°C/W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=250μA	150	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current(T_C=25℃)	V_{DS}=120V, V_{GS}=0V	--	--	1	μA
	Zero Gate Voltage Drain Current(T_C=125℃)	V_{DS}=120V, V_{GS}=0V	--	--	100	uA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V, V_{DS}=0V	--	--	±100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	2.0	3.0	4.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance③	V_{GS}=12V, I_D=20A	--	32	40	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance③	V_{GS}=10V, I_D=20A	--	33	40	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=75V, V_{GS}=0V, f=1MHz	--	2294	--	pF
C_{oss}	Output Capacitance		--	101	--	pF
C_{rss}	Reverse Transfer Capacitance		--	5.8	--	pF
R_g	Gate Resistance	f=1MHz		12		Ω
Q_g	Total Gate Charge	V_{DS}=75V I_D=20A, V_{GS}=10V	--	30.5	--	nC
Q_{gs}	Gate Source Charge		--	7.3	--	nC
Q_{gd}	Gate Drain Charge		--	3.9	--	nC
Switching Characteristics @ T_J = 25°C (unless otherwise stated)						
$t_{d(on)}$	Turn on Delay Time	V_{DD}=75V, I_D=5A, R_G=3.3Ω, V_{GS}=10V	--	29	--	ns
t_r	Turn on Rise Time		--	15	--	ns
$t_{d(off)}$	Turn Off Delay Time		-	9	--	ns
t_f	Turn Off Fall Time		--	4.2	--	ns
Source Drain Diode Characteristics @ T_J = 25°C (unless otherwise stated)						
t_{rr}	Reverse Recovery Time	I_{SD}=20A, V_{GS}=0V di/dt=500A/μs	--	59	--	nS
Q_{rr}	Reverse Recovery Charge		--	445	--	nC
V_{SD}	Forward on voltage③	I_{SD}=20A,V_{GS}=0V	--	0.86	1.2	V

Typical Characteristics

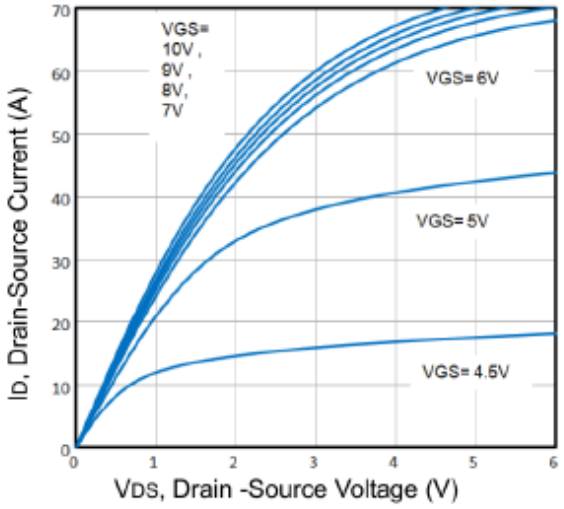


Fig1. Typical Output Characteristics

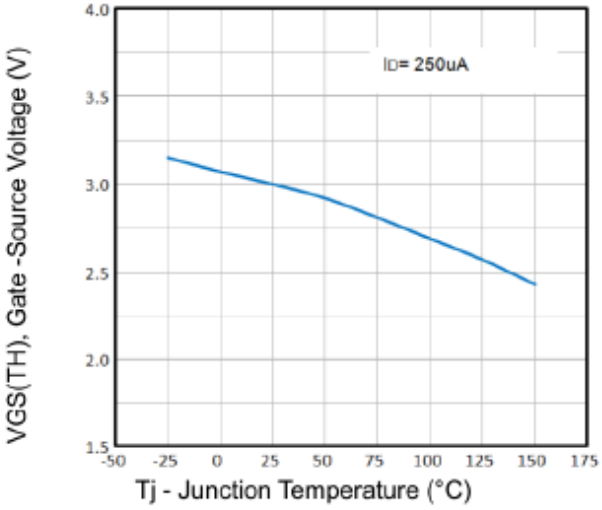


Fig2. Normalized Threshold Voltage Vs. Temperature

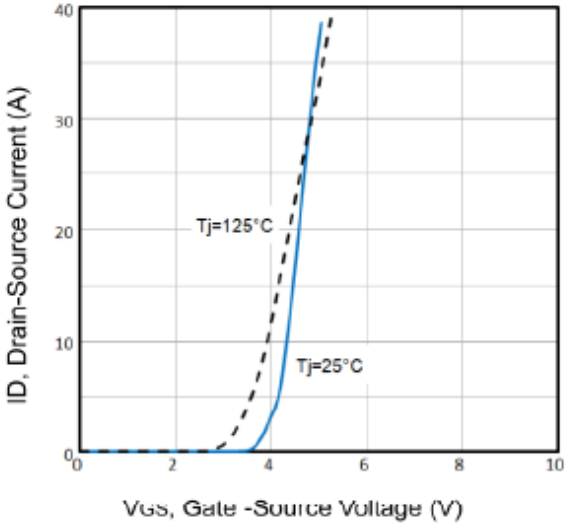


Fig3. Typical Transfer Characteristics

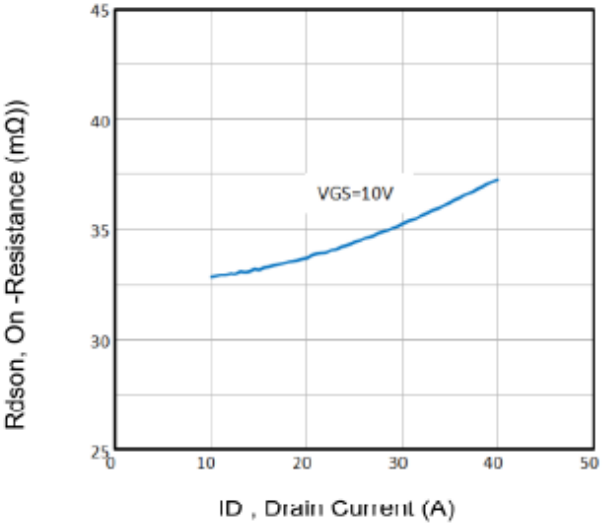


Fig4. On-Resistance vs. Drain Current and Gate Voltage

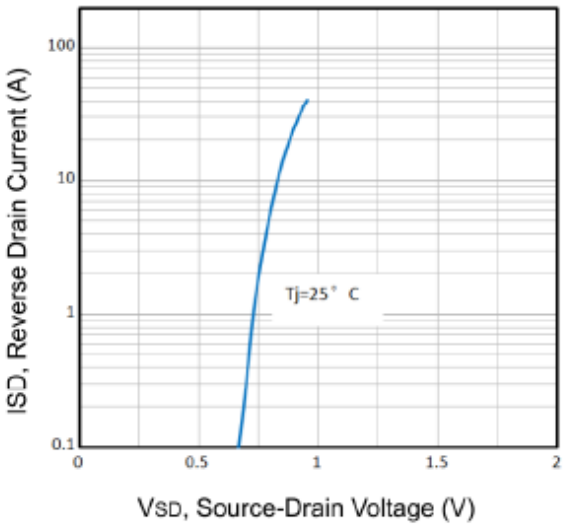


Fig5. Typical Source-Drain Diode Forward Voltage

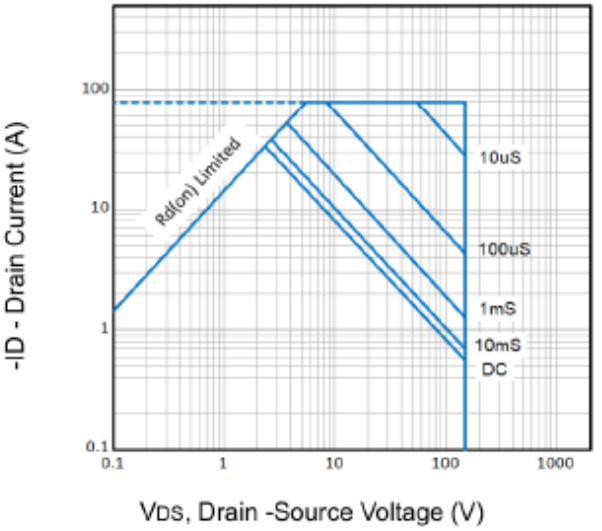


Fig6. Maximum Safe Operating Area

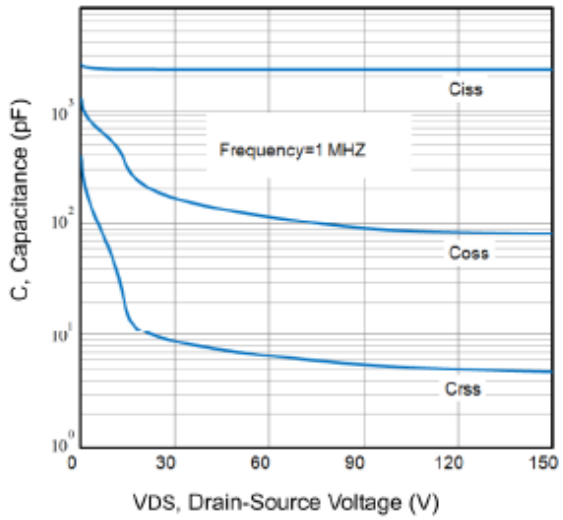


Fig7. Typical Capacitance Vs. Drain-Source Voltage

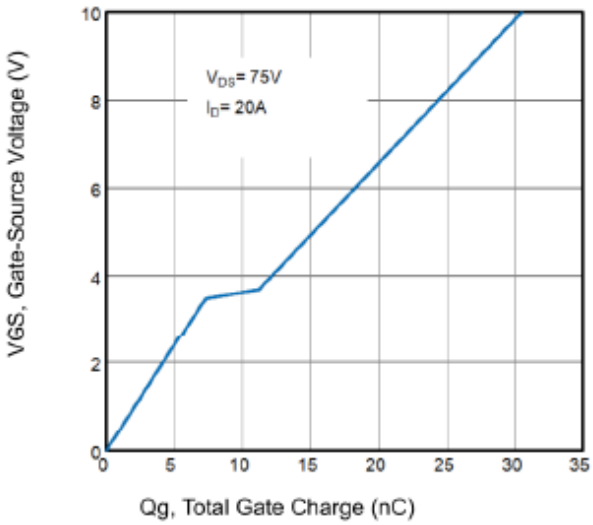


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

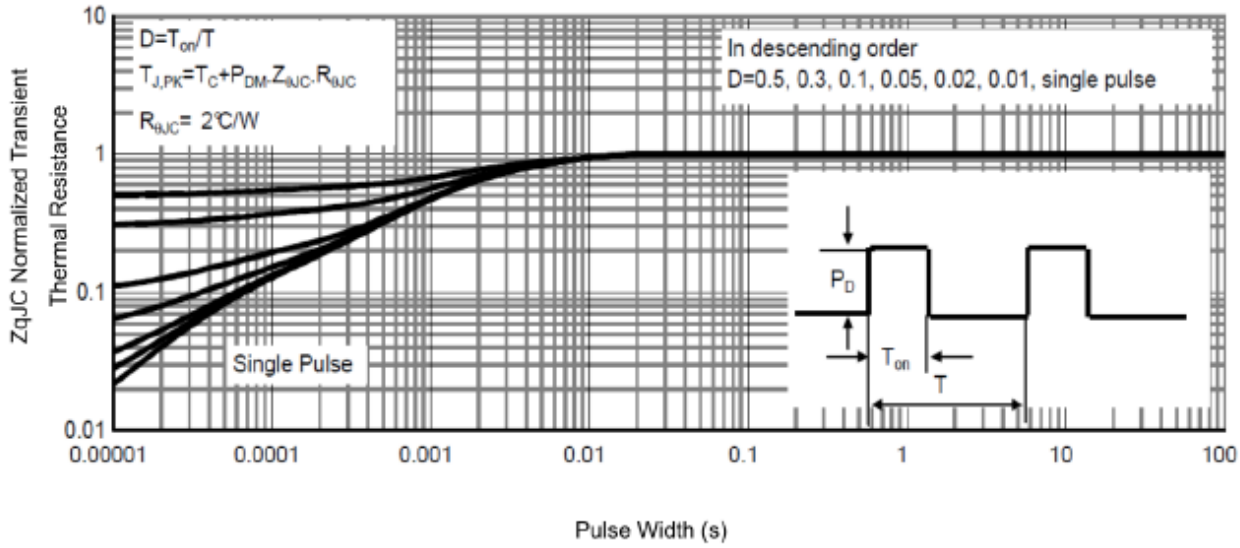


Fig9. Normalized Maximum Transient Thermal Impedance

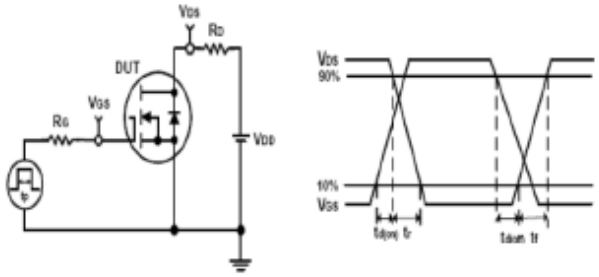


Fig10. Switching Time Test Circuit and waveforms

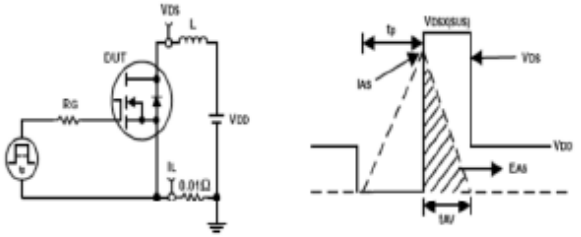
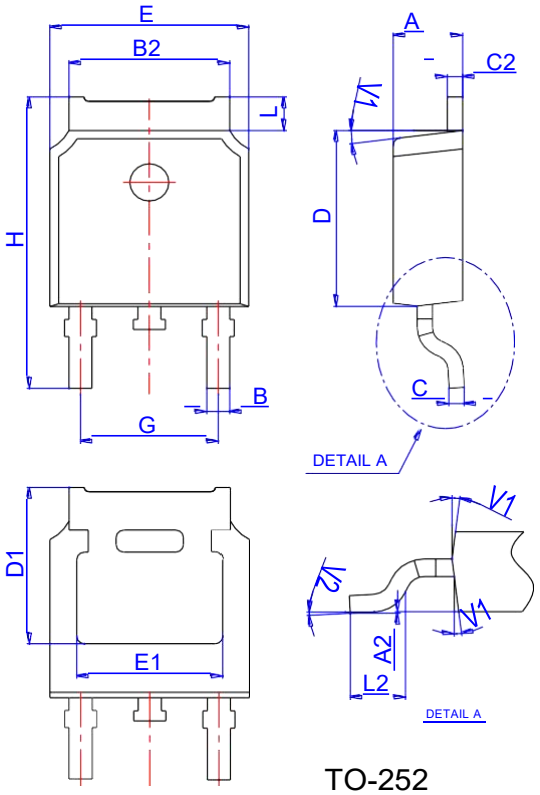


Fig11. Unclamped Inductive Test Circuit and waveforms

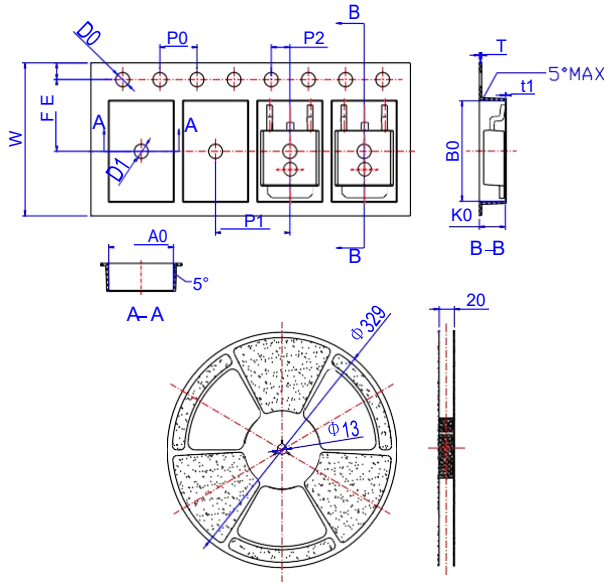
Package Mechanical Data-TO-252-JQ Single



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