

TMN10015YS

N-Channel Enhancement Mosfet

General Description

- Low $R_{DS(ON)}$
- RoHS and Halogen-Free Compliant

Applications

- Load switch
- PWM

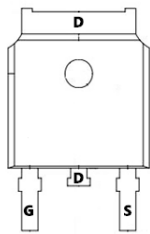
General Features

$V_{DS} = 100V$ $I_D = 15A$

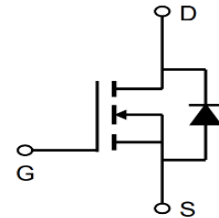
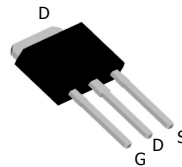
$R_{DS(ON)} = 75m\Omega(Typ.) @ V_{GS} = 10V$

100% UIS Tested

100% R_g Tested



Y:TO-251S-3L



Marking: 15N10

Absolute Maximum Ratings (TC=25°C unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	15	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	8	A
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	3	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	2.4	A
I_{DM}	Pulsed Drain Current ²	20	A
EAS	Single Pulse Avalanche Energy ³	6.1	mJ
I_{AS}	Avalanche Current	10	A
$P_D @ T_C = 25^\circ C$	Total Power Dissipation ³	30	W
$P_D @ T_A = 25^\circ C$	Total Power Dissipation ³	2	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	---	62	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	6.6	°C/W

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	100	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =100V, V _{GS} =0V,	-	-	1.0	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} =±20V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.0	1.5	2.5	V
R _{DS(on)}	Static Drain-Source on-Resistance note3	V _{GS} =10V, I _D =5A	-	75	110	mΩ
		V _{GS} =4.5V, I _D =3A	-	96	140	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	-	765	-	pF
C _{oss}	Output Capacitance		-	38	-	pF
C _{rss}	Reverse Transfer Capacitance		-	33	-	pF
Q _g	Total Gate Charge	V _{DS} =50V, I _D =2A, V _{GS} =10V	-	18	-	nC
Q _{gs}	Gate-Source Charge		-	2.5	-	nC
Q _{gd}	Gate-Drain(“Miller”) Charge		-	4	-	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DS} =50V, I _D =3A, R _G =1.8Ω, V _{GS} =10V	-	7.5	-	ns
t _r	Turn-on Rise Time		-	6	-	ns
t _{d(off)}	Turn-off Delay Time		-	21	-	ns
t _f	Turn-off Fall Time		-	9	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	10	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	40	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S =10A	-	-	1.2	V
t _{rr}	Body Diode Reverse Recovery Time	I _F =3A, dI/dt=100A/μs	-	21	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	22	-	nC

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition : $T_J=25^{\circ}\text{C}, V_{DD}=30V, V_G=10V, L=0.5mH, R_g=25\Omega, I_{AS}=4A$

3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

Typical Performance Characteristics

Figure1: Output Characteristics

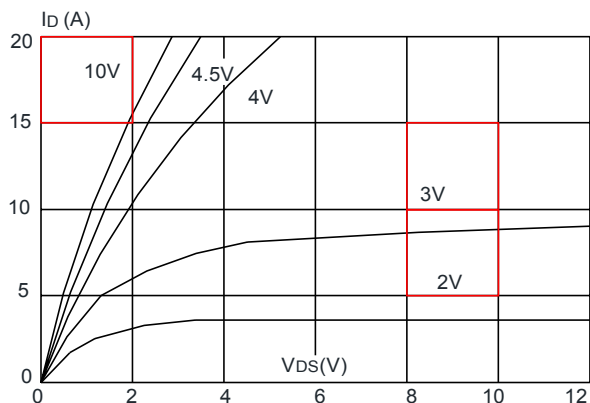


Figure 2: Typical Transfer Characteristics

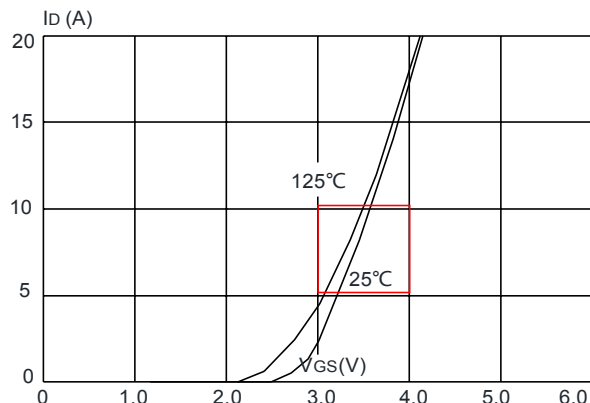


Figure 3: On-resistance vs. Drain Current

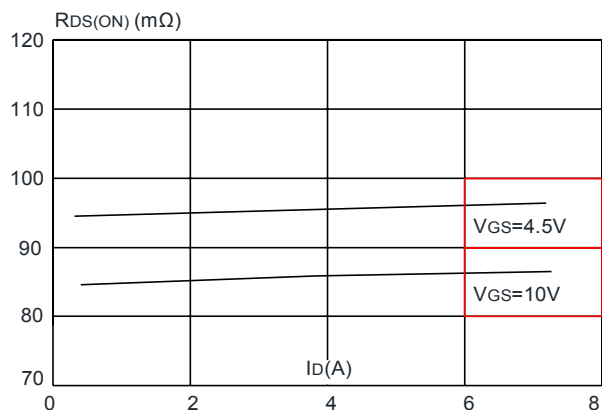


Figure 4 : Body Diode Characteristics

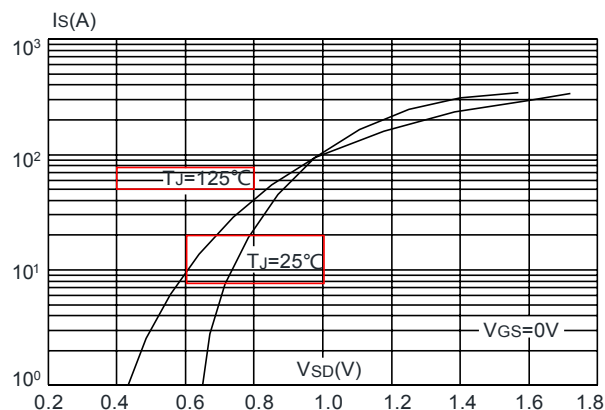


Figure 5: Gate Charge Characteristics

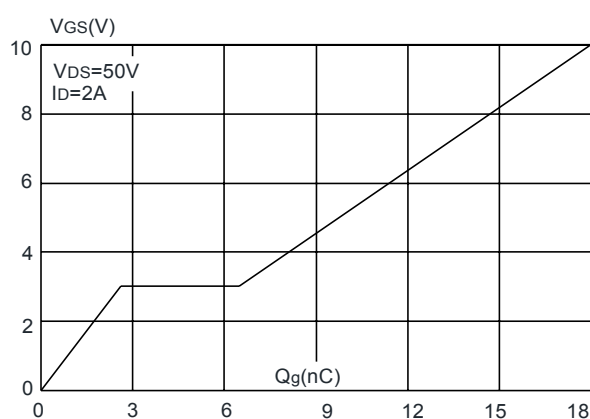
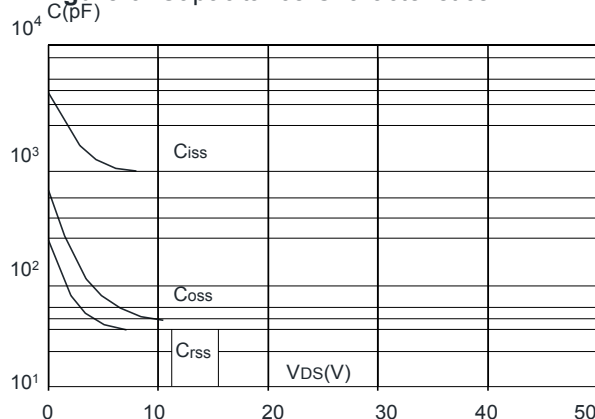


Figure 6: Capacitance Characteristics



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Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

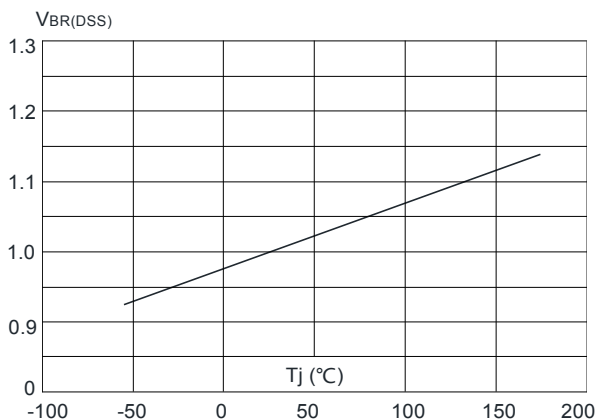


Figure 8: Normalized on Resistance vs. Junction Temperature

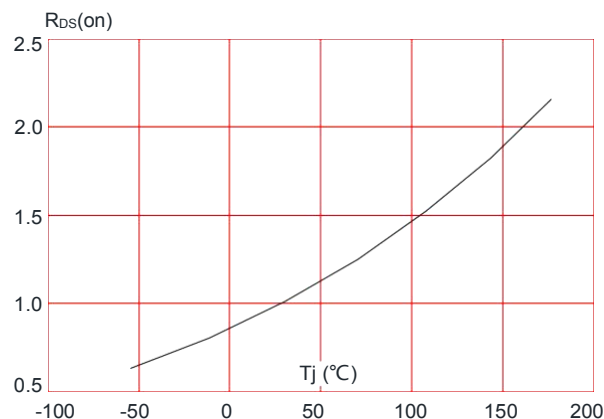


Figure 9: Maximum Safe Operating Area

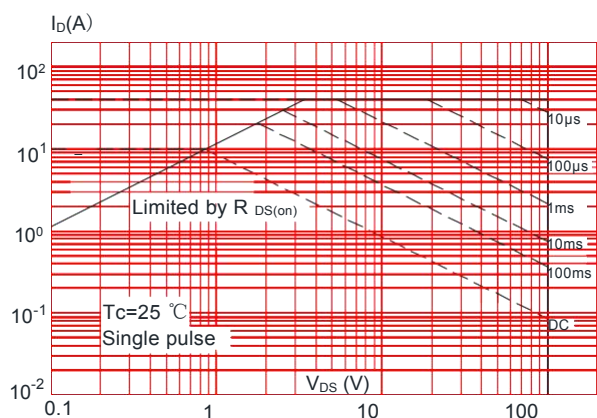


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

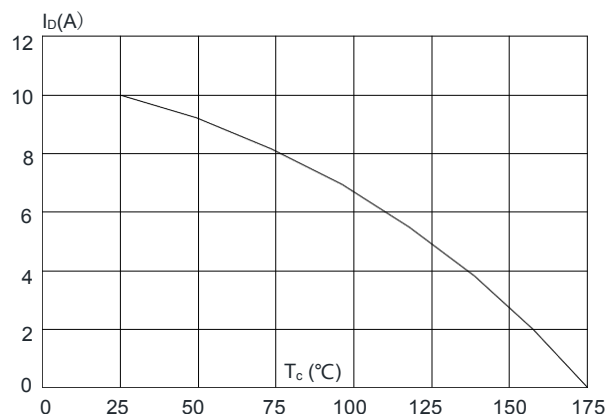
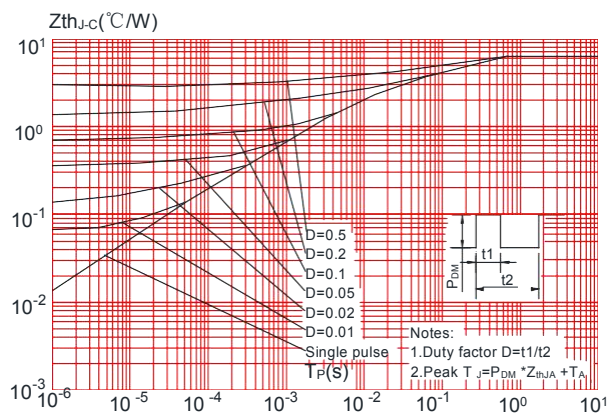


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Package Information:TO-251S-3L

UNIT: mm

SYMBOL	min	nom	max
A	2.20		2.40
b	0.50		0.85
C	0.45	0.50	0.60
D	6.50		6.70
D1	5.10		5.50
E	5.9		6.20
e	2.18	2.29	2.38
L	11.00		12.40
L1	4.8		5.3
L2	3.5		4.2

