

MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

IPT015N10NF2SATMA1-MS

Product specification

Description

The IPT015N10NF2SATMA1-MS use advanced SGT MOSFET technology to provide low RDS(ON), low gate charge, fast switching and excellent avalanche characteristics. This device is specially designed to get better ruggedness.

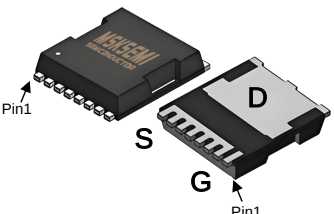
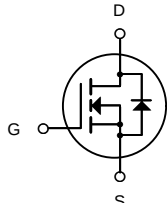
Features

- $V_{DS} = 100V$ $I_D = 350A$
- $R_{DS(ON)} < 2m\Omega$ $V_{GS}=10V$

Application

- Battery Protection
- Power Distribution

Reference News

TOLL-8	N-Channel MOSFET	Marking
		

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

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_c=25^\circ C$	I_D	350	A
	$T_c=100^\circ C$		200	
Pulsed Drain Current ¹		I_{DM}	1248	A
Single Pulse Avalanche Energy ²		EAS	1250	mJ
Total Power Dissipation	$T_c=25^\circ C$	P_D	390.6	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	$^\circ C$
Thermal Resistance from Junction-to-Ambient ³		$R_{\theta JA}$	39	$^\circ C/W$
Thermal Resistance from Junction-to-Case		$R_{\theta JC}$	0.32	$^\circ C/W$

Electrical Characteristics (T_J=25°C unless otherwise specified)

Parameter		Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics							
Drain-Source Breakdown Voltage		V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	100	-	-	V
Gate-body Leakage current		I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	T _J =25°C	I _{DSS}	V _{DS} = 100V, V _{GS} = 0V	-	-	1	μA
	T _J = 100°C			-	-	100	
Gate-Threshold Voltage		V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	2	3	4	V
Drain-Source on-Resistance ⁴		R _{DS(on)}	V _{GS} = 10V, I _D = 20A	-	1.4	2.0	mΩ
Forward Transconductance ⁴		g _{fs}	V _{DS} = 10V, I _D =20A	-	84	-	S
Dynamic Characteristics ⁵							
Input Capacitance		C _{iss}	V _{DS} = 50V, V _{GS} =0V, f =1MHz	-	14300	-	pF
Output Capacitance		C _{oss}		-	2120	-	
Reverse Transfer Capacitance		C _{rss}		-	50	-	
Gate Resistance		R _g	f=1MHz	-	2.8	-	Ω
Switching Characteristics ⁵							
Total Gate Charge		Q _g	V _{GS} = 10V, V _{DS} = 50V, I _D = 20A	-	250	-	nC
Gate-Source Charge		Q _{gs}		-	53	-	
Gate-Drain Charge		Q _{gd}		-	77	-	
Turn-on Delay Time		t _{d(on)}	V _{GS} =10V, V _{DD} = 50V, R _G = 3Ω, I _D = 20A	-	41	-	ns
Rise Time		t _r		-	88	-	
Turn-off Delay Time		t _{d(off)}		-	163	-	
Fall Time		t _f		-	98	-	
Body Diode Reverse Recovery Time		t _{rr}	I _F =20A, di/dt = 100A/μs	-	106	-	ns
Body Diode Reverse Recovery Charge		Q _{rr}		-	245	-	nC
Drain-Source Body Diode Characteristics							
Diode Forward Voltage ⁴		V _{SD}	I _S = 20A, V _{GS} = 0V	-	-	1.2	V
Continuous Source Current	T _C =25°C	I _S	-	-	-	312	A

Note:

- The maximum current rating is package limited.
- Repetitive rating; pulse width limited by max. junction temperature.
- V_{DD}=32 V, R_G=25 Ω, L=0.5mH, starting T_J=25°C.
- P_D is based on max. junction temperature, using junction-case thermal resistance.
- The value of R_{θJA} is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with Ta=25°C .

Typical Characteristics

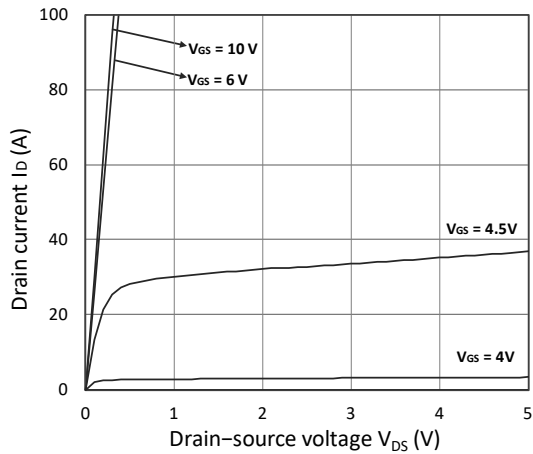


Figure 1. Output Characteristics

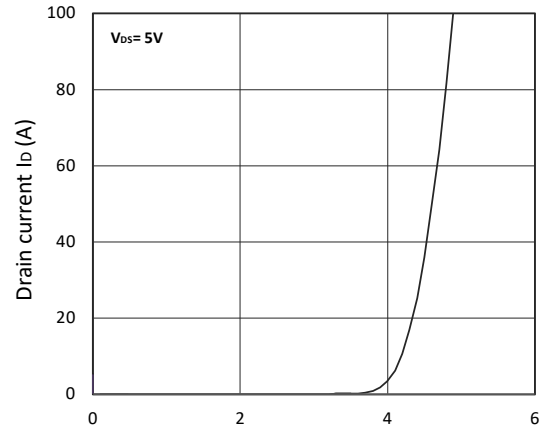


Figure 2. Transfer Characteristics

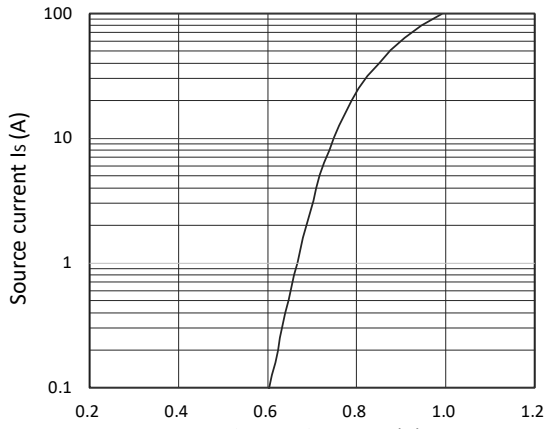


Figure 3. Forward Characteristics of Reverse

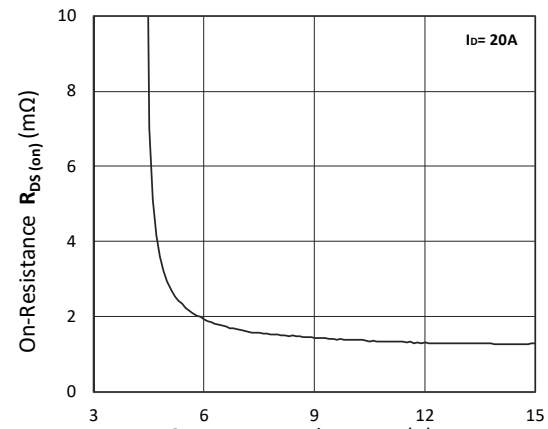


Figure 4. $R_{DS(on)}$ vs. V_{GS}

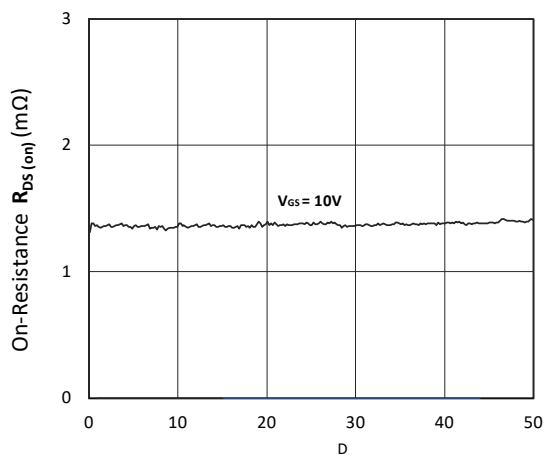


Figure 5. $R_{DS(on)}$ vs. I_D

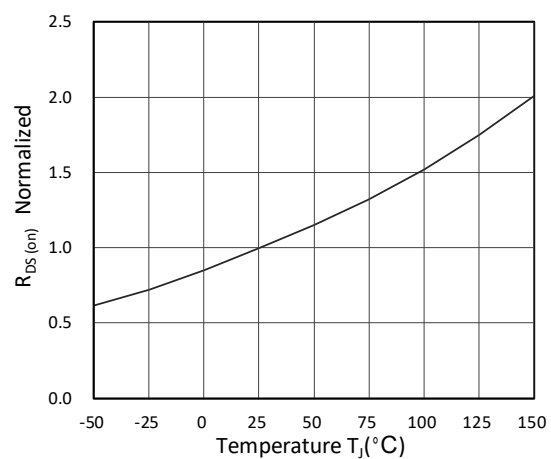


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

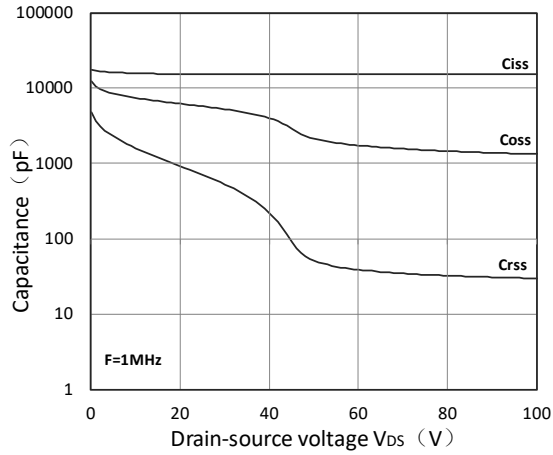


Figure 7. Capacitance Characteristics

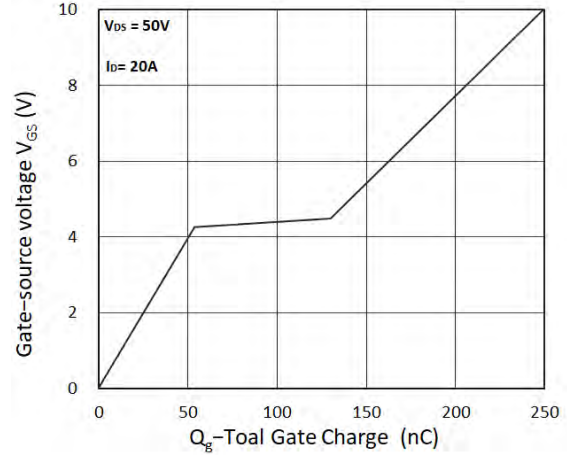


Figure 8. Gate Charge Characteristics

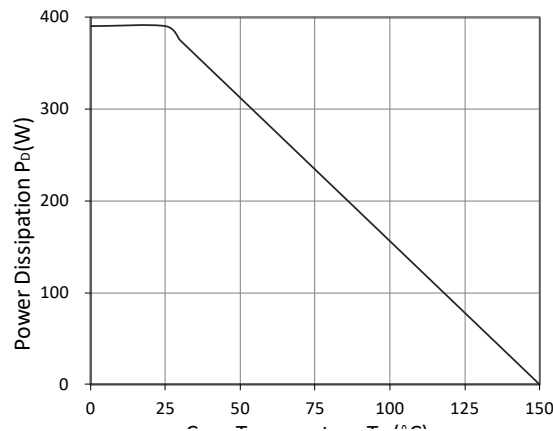


Figure 9. Power Dissipation

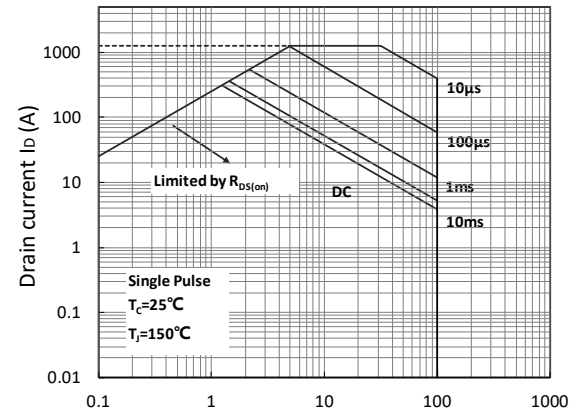


Figure 10. Safe Operating Area

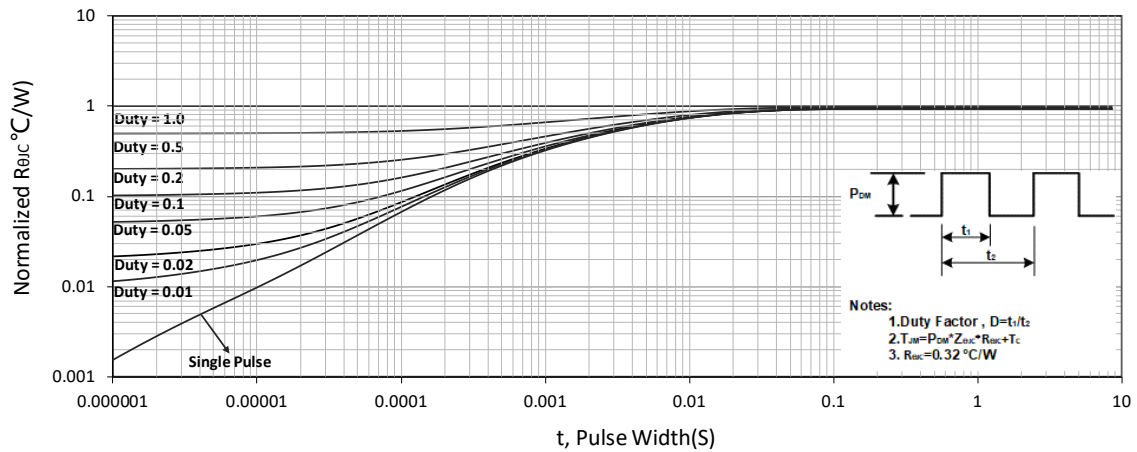


Figure 11. Normalized Maximum Transient Thermal Impedance

Test Circuit

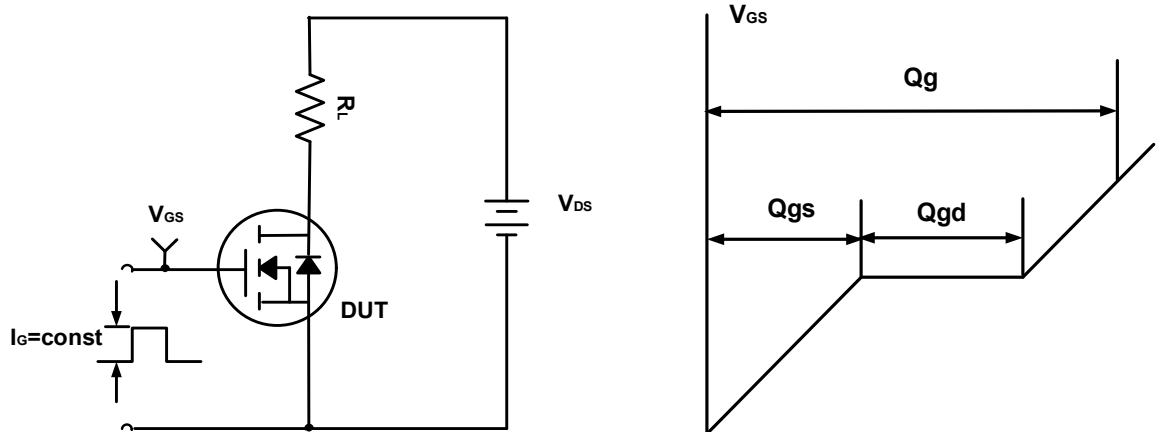


Figure A. Gate Charge Test Circuit & Waveforms

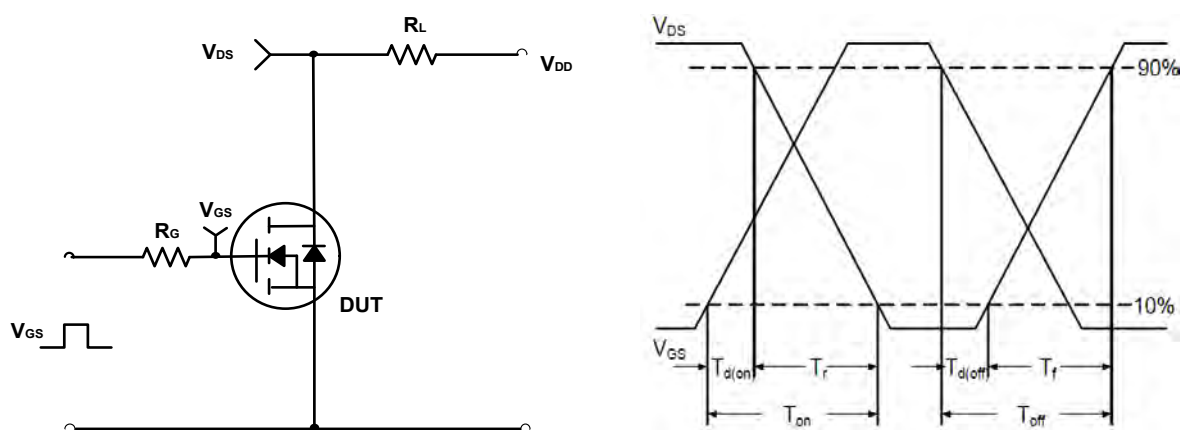


Figure B. Switching Test Circuit & Waveforms

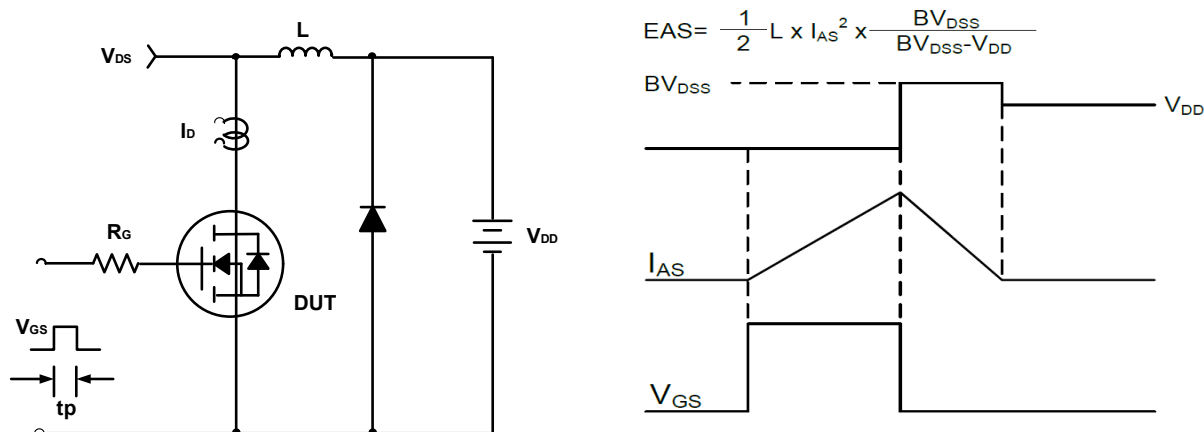
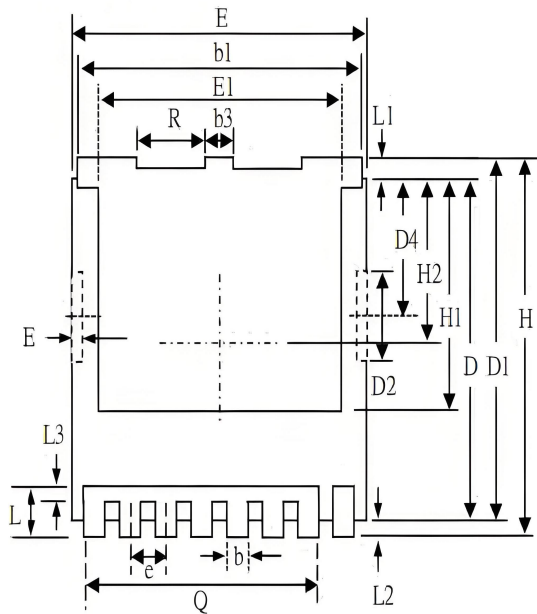
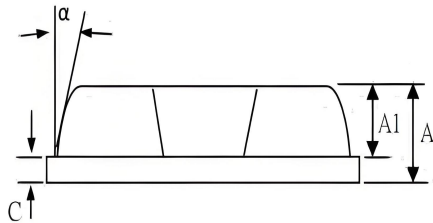


Figure C. Unclamped Inductive Switching Circuit & Waveforms

TOLL-8 Package Information



BACKSIDE VIEW



1.All Dimension Are In Millimeters.

2.Dimension Does Not Include Mold Protrusions.

SYMBOLS	MIN	NOM	MAX
A	2.20	2.30	2.40
A1	1.70	1.80	1.90
b	0.70	0.80	0.90
b1	9.70	9.80	9.90
b3	1.10	1.20	1.30
C	0.40	0.50	0.60
D	10.28	10.38	10.58
D1	9.80	11.08	11.80
D2	3.10	3.30	3.50
D4	4.37	4.55	4.77
E	9.70	9.90	10.10
E1	7.90	8.10	8.30
E2	0.50	0.70	0.90
e	1.20BCS		
H	11.48	11.68	11.88
H1	6.95BCS		
H2	5.89BCS		
L	1.40	1.90	2.10
L1	0.60	0.70	0.80
L2	0.50	0.60	0.70
L3	0.30	0.70	1.30
Q	8.00 REF.		
R	2.95	3.10	3.25
α	4°		10°

REEL SPECIFICATION

P/N	PKG	QTY
IPT015N10NF2SATMA1-MS	TOLL-8	2000

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