

EVVOSEMI[®]

THINK CHANGE DO



ESD



TVS



MOS



LDO



Diode



Sensor



DC-DC

Product Specification

▶ Domestic	Part Number	15N10
▶ Overseas	Part Number	15N10
▶ Equivalent	Part Number	15N10

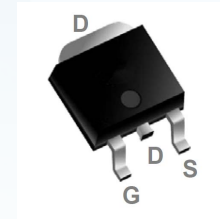
EV is the abbreviation of name EVVO

■ N-Ch MOSFET

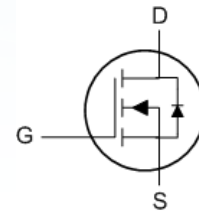
General Description

The 15N10 is the highest performance trench N-ch MOSFET with extreme high cell density , which provide excellent RDSON and gate charge for most of the synchronous buck converter applications .

The 15N10 meet the RoHS and Green Product requirement , 100% EAS guaranteed with full function reliability approved.



■ Simplified outline(TO-252)



Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent Cdv/dt effect decline
- Green Device Available

Applications

- High Frequency Point-of-Load Synchronous Buck Converter
- Networking DC-DC Power System
- Load Switch

BVDSS	RDSON	ID
100V	80mΩ	15A

Absolute Maximum Ratings

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, $V_{GS} @ 10V^1$	11	A
I_{DM}	Pulsed Drain Current ²	64	A
EAS	Single Pulse Avalanche Energy ³	30	mJ
I_{AS}	Avalanche Current	6	A
$P_D@T_C=25^{\circ}C$	Total Power Dissipation ³	60	W
$P_D@T_C=100^{\circ}C$	Total Power Dissipation ³	30	W
T_{STG}	Storage Temperature Range	-55 to 170	$^{\circ}C$
T_J	Operating Junction Temperature Range	-55 to 170	$^{\circ}C$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	---	50	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	2.5	$^{\circ}C/W$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	100	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BVDSS Temperature Coefficient	Reference to 25°C , $I_D=1\text{mA}$	---	0.098	---	V/ $^\circ\text{C}$
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V, I_D=5A$	---	80	100	$m\Omega$
		$V_{GS}=4.5V, I_D=2A$	---	115	130	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	1.5	2.0	2.5	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-4.57	---	mV/ $^\circ\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=80V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=80V, V_{GS}=0V, T_J=55^\circ\text{C}$	---	---	5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=5V, I_D=5A$	---	13	---	S
R_g	Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1\text{MHz}$	---	2	4	Ω
Q_g	Total Gate Charge (10V)	$V_{DS}=50V, V_{GS}=10V, I_D=5A$	12	21	30	nC
Q_{gs}	Gate-Source Charge		3.4	4.9	6.4	
Q_{gd}	Gate-Drain Charge		2.9	5.8	8.7	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=30V, V_{GS}=10V, R_G=6\Omega$ $I_D=1A, R_L=30\Omega$	---	13	24	ns
T_r	Rise Time		---	10	19	
$T_{d(off)}$	Turn-Off Delay Time		---	32	60	
T_f	Fall Time		---	16	30	
C_{iss}	Input Capacitance	$V_{DS}=30V, V_{GS}=0V, f=1\text{MHz}$	---	940	---	pF
C_{oss}	Output Capacitance		---	80	---	
C_{rss}	Reverse Transfer Capacitance		---	50	---	

Guaranteed Avalanche Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
EAS	Single Pulse Avalanche Energy ⁵	$V_{DD}=25V, L=0.5\text{mH}, I_{AS}=6A$	25	---	---	mJ

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current ^{1,6}	$V_G=V_D=0V$, Force Current	---	---	5	A
I_{SM}	Pulsed Source Current ^{2,6}		---	---	64	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V, I_S=5A, T_J=25^\circ\text{C}$	---	---	1.1	V
t_{rr}	Reverse Recovery Time	$I_F=5A, dI/dt=100A/\mu s, T_J=25^\circ\text{C}$	33	47	61	nS
Q_{rr}	Reverse Recovery Charge		61	87	113	nC

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper, $t \leq 10\text{sec}$.
- 2.The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3.The EAS data shows Max. rating. The test condition is $V_{DD}=25V, V_{GS}=10V, L=0.5\text{mH}, I_{AS}=6A$
- 4.The power dissipation is limited by 150°C junction temperature
- 5.The Min. value is 100% EAS tested guarantee.
- 6.The data is theoretically the same as I_D and I_{DM} , in real applications, should be limited by total power dissipation.

Typical Characteristics

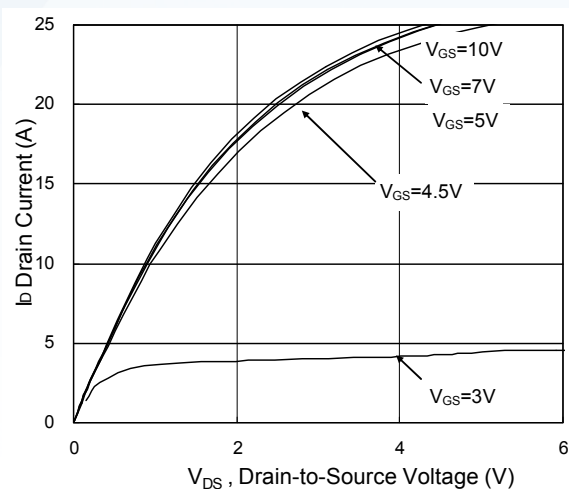


Fig.1 Typical Output Characteristics

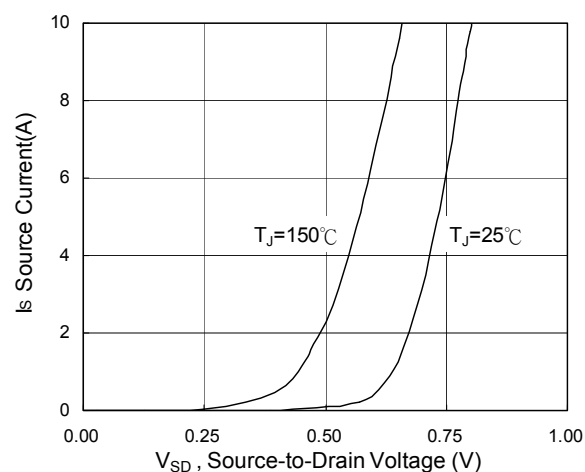


Fig.3 Forward Characteristics Of Reverse

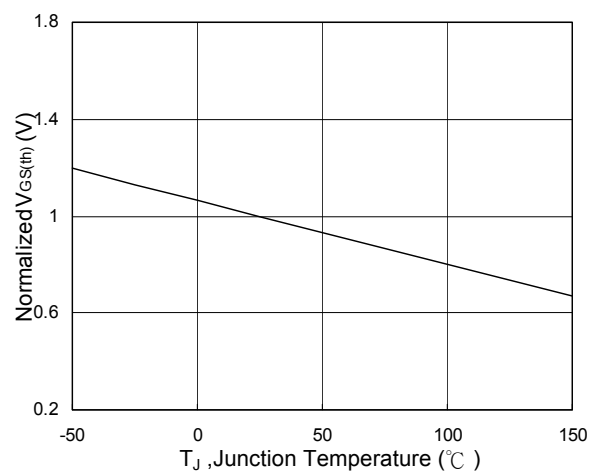


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

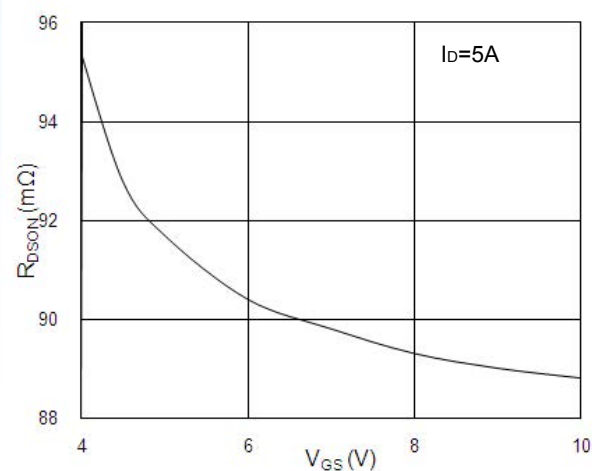


Fig.2 On-Resistance vs. Gate-Source

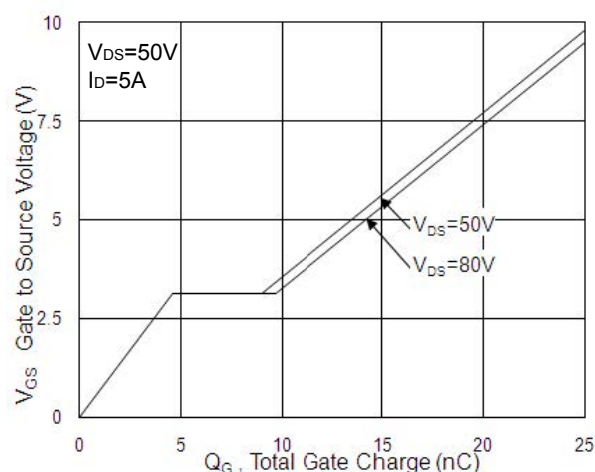


Fig.4 Gate-Charge Characteristics

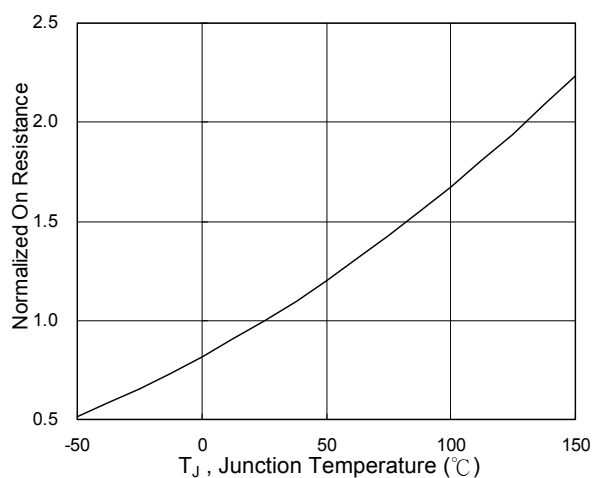


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

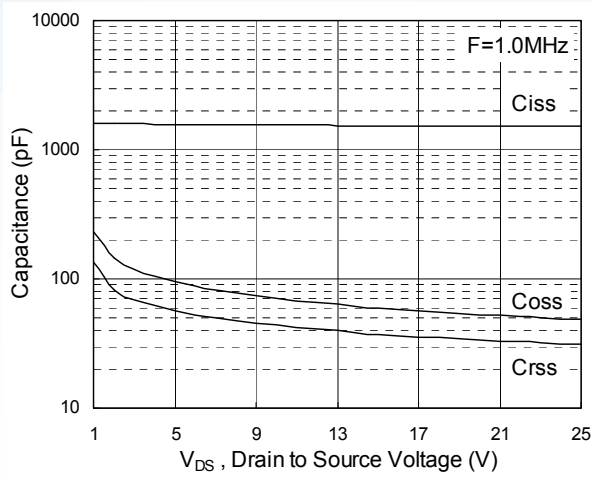


Fig.7 Capacitance

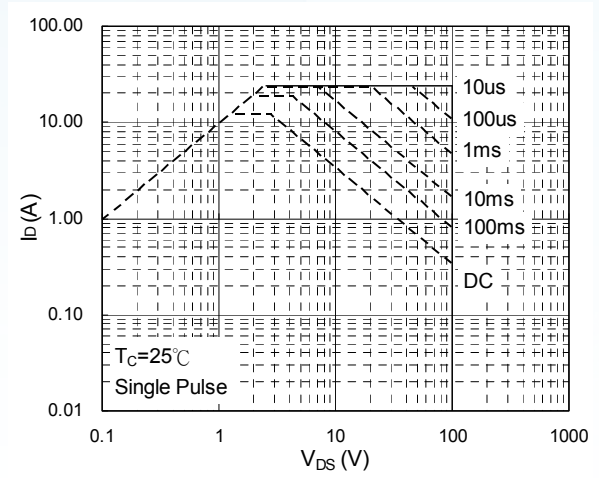


Fig.8 Safe Operating Area

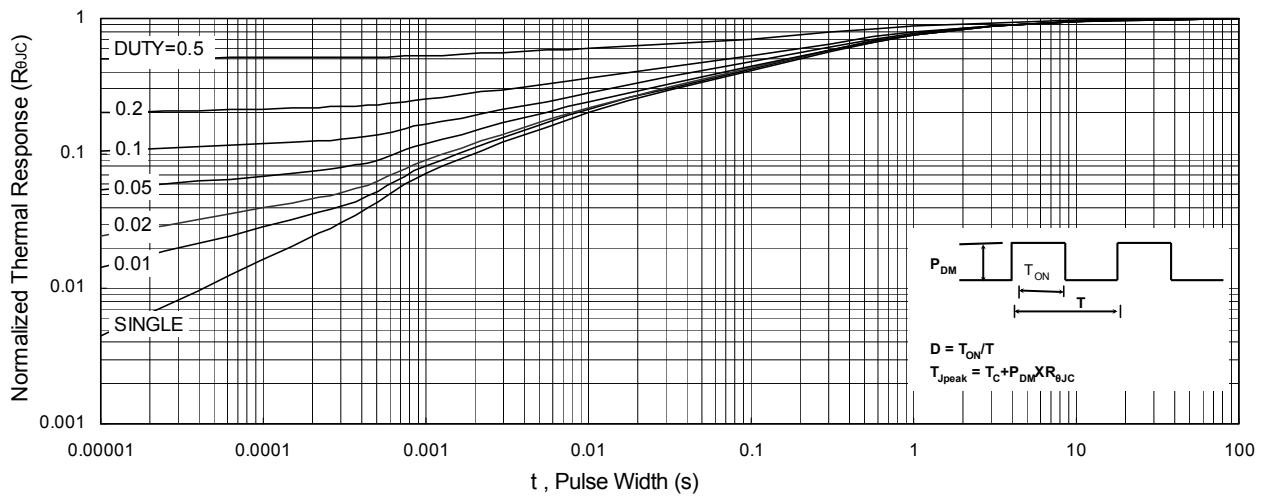


Fig.9 Normalized Maximum Transient Thermal Impedance

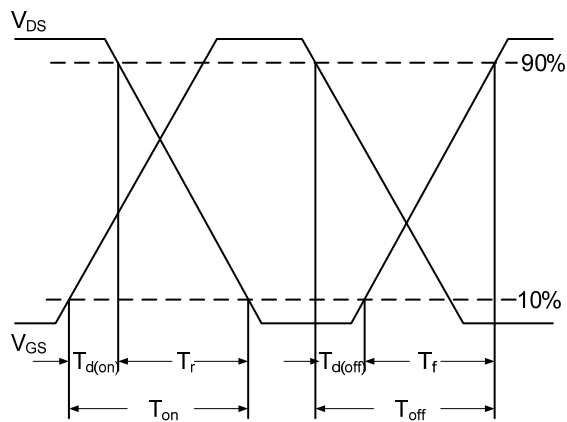


Fig.10 Switching Time Waveform

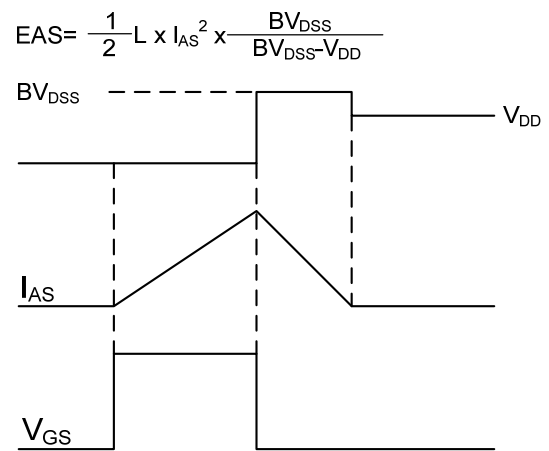
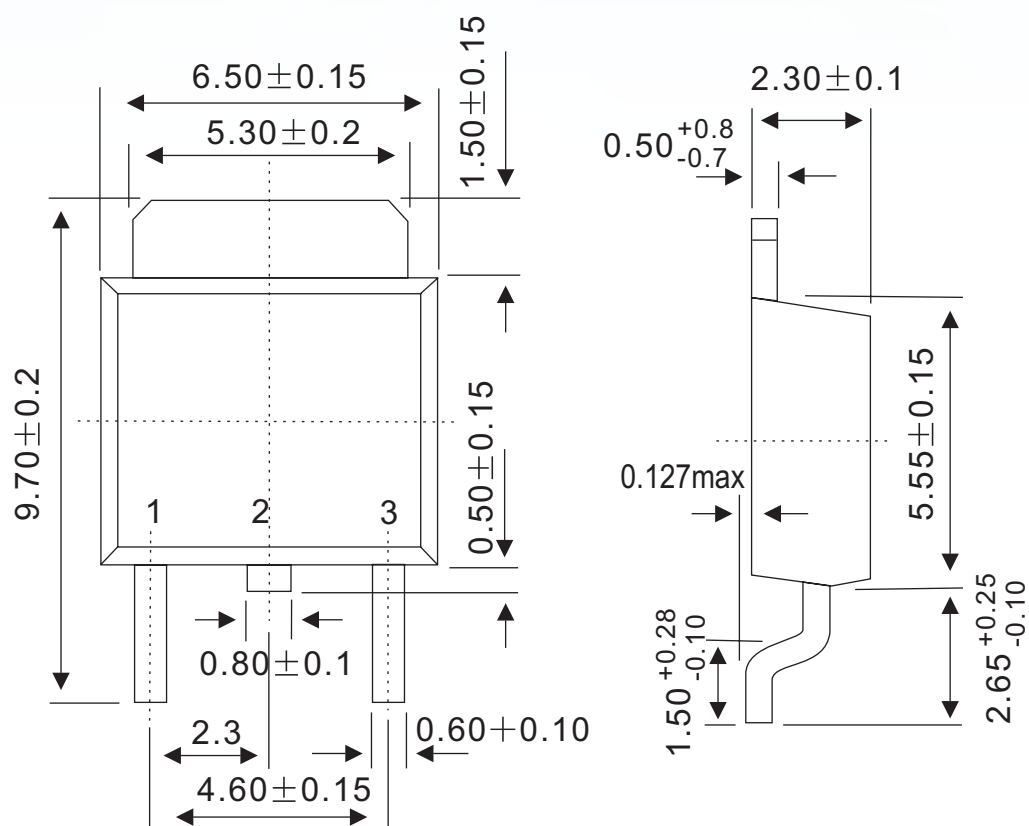


Fig.11 Unclamped Inductive Switching Waveform

■ TO-252

● Unit:mm



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