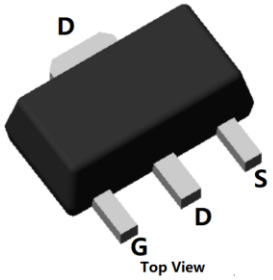
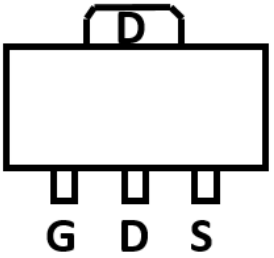
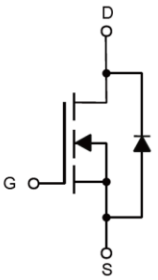
N-Channel Enhancement Mode Field Effect Transistor





SOT-89



Product Summary

- V_{DS} 20 V
- I_D 10 A
- $R_{DS(ON)}$(at V_{GS}=4.5V) ＜11 mohm
- $R_{DS(ON)}$(at V_{GS}=2.5V) ＜15 mohm
- $R_{DS(ON)}$(at V_{GS}=1.8V) ＜20 mohm

General Description

- Trench Power LV MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

Applications

- DC-DC Converters
- Power management functions

■ Absolute Maximum Ratings (T_A=25℃unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	20	V
Gate-source Voltage		V_{GS}	±10	V
Drain Current	T_A=25℃	I_D	10	A
	T_A=70℃		8	
Pulsed Drain Current [A]		I_{DM}	43	A
Total Power Dissipation	T_A=25℃	P_D	1.5	W
	T_C=25℃		4.0	W
Thermal Resistance Junction-to-Ambient [B]		$R_{\theta JA}$	83	℃/ W
Thermal Resistance Junction-to-Case		$R_{\theta JC}$	31	℃/ W
Junction and Storage Temperature Range		T_J ,T_{STG}	-55～+150	℃

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
H10N02A	F1	2010	1000	10000	40000	7“ reel
	F2	2010	1000	8000	32000	7“ reel

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

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=250μA	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V,V_{GS}=0V			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±10V, V_{DS}=0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA	0.45	0.62	1.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= 4.5V, I_D=5A		7	11	mΩ
		V_{GS}= 2.5V, I_D=3A		8.5	15	
		V_{GS}= 1.8V, I_D=2A		13	20	
Diode Forward Voltage	V_{SD}	I_S=10A,V_{GS}=0V		0.8	1.2	V
Maximum Body-Diode Continuous Current	I_S				10	A
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=10V,V_{GS}=0V,f=1MHZ		2250		pF
Output Capacitance	C_{oss}			334		
Reverse Transfer Capacitance	C_{rss}			271		
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=4.5V,V_{DS}=10V,I_D=15A		27.9		nC
Gate-Source Charge	Q_{gs}			4.1		
Gate-Drain Charge	Q_{gd}			7.4		
Body Diode Reverse Recovery Charge	Q_{rr}	I_F=15A,dI/dt=100A/μs		2.2		
Body Diode Reverse Recovery Time	T_{rr}			16.3		ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=4.5V,V_{DD}=10V,I_D=10A,R_L=1Ω R_{GEN}=3Ω		13		
Turn-on Rise Time	t_r			53		
Turn-off Delay Time	$t_{D(off)}$			61		
Turn-off fall Time	t_f			76		

A. Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.

B. $R_{\theta JA}$ is the sum of the junction-to-Case and Case-to-ambient thermal resistance, where the Case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design, while $R_{\theta JA}$ is determined by the board design. The maximum rating presented here is based on mounting on a 1 in 2 pad of 2oz copper.

■ Typical Performance Characteristics

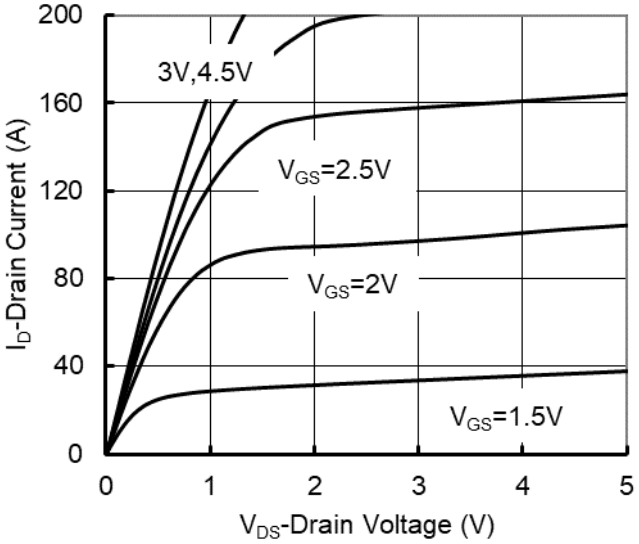


Figure1. Output Characteristics

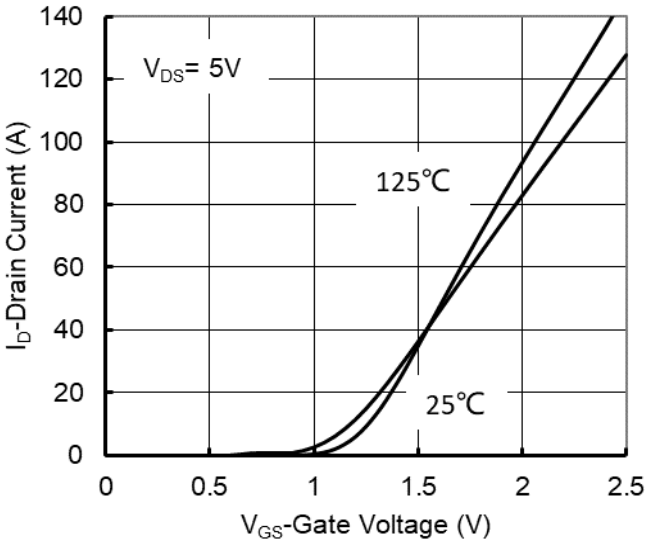


Figure2. Transfer Characteristics

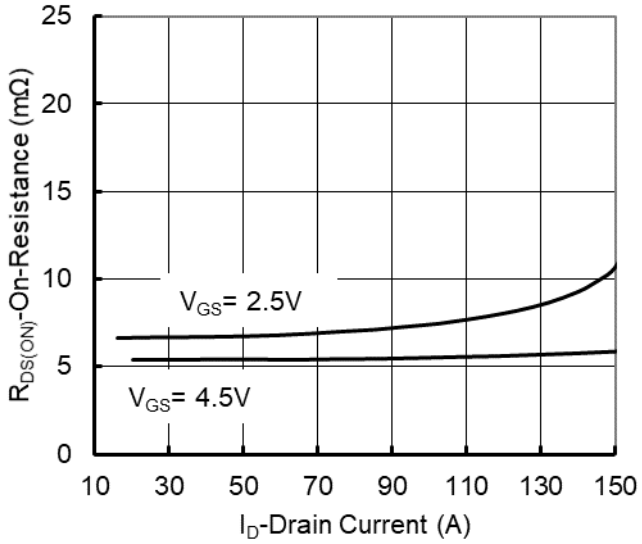


Figure3. On-Resistance vs. Drain Current

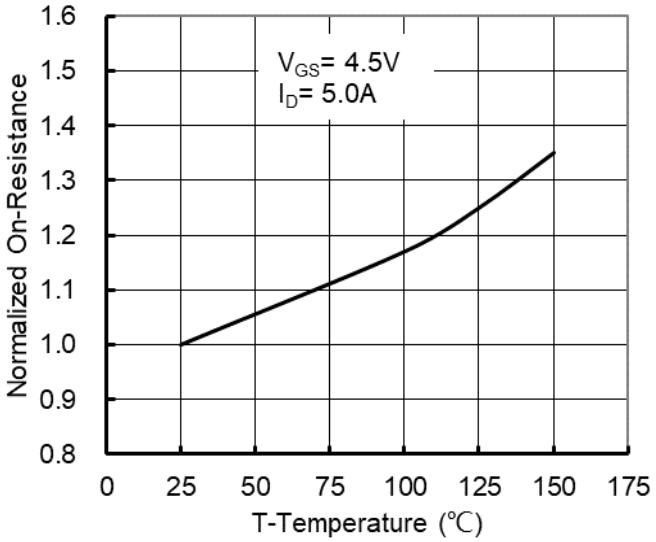


Figure4.On-Resistance vs. Junction Temperature

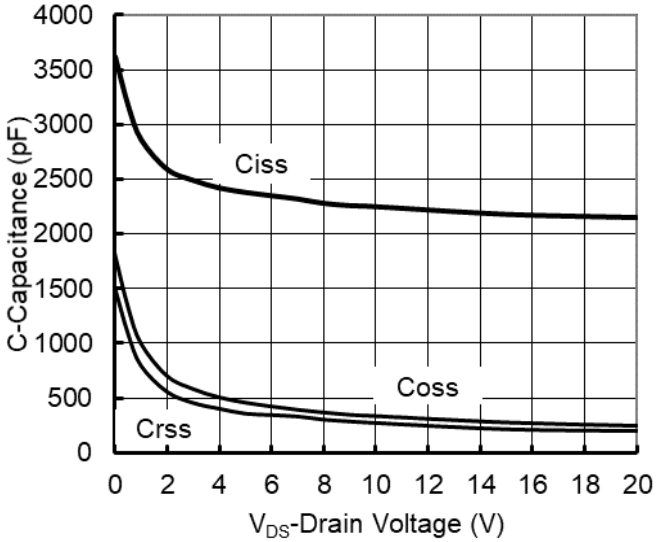


Figure5.Capacitance Characteristics

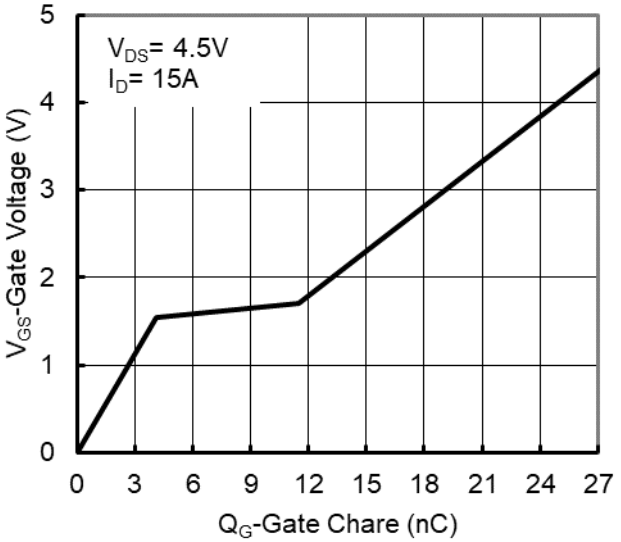


Figure6. Gate Charge

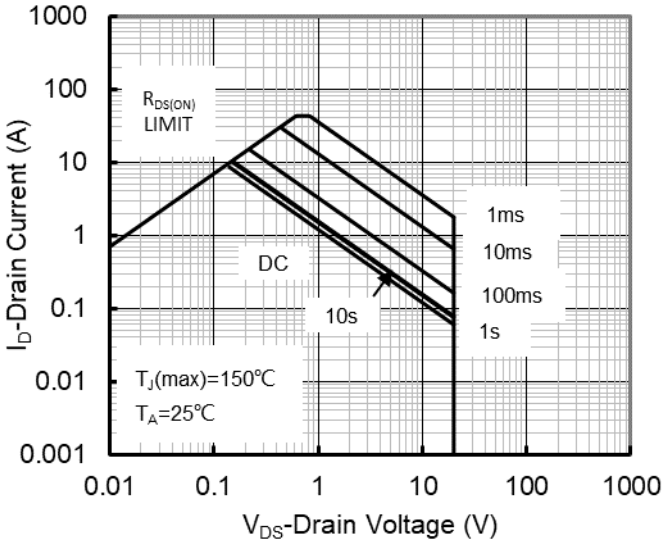


Figure7. Safe Operation Area

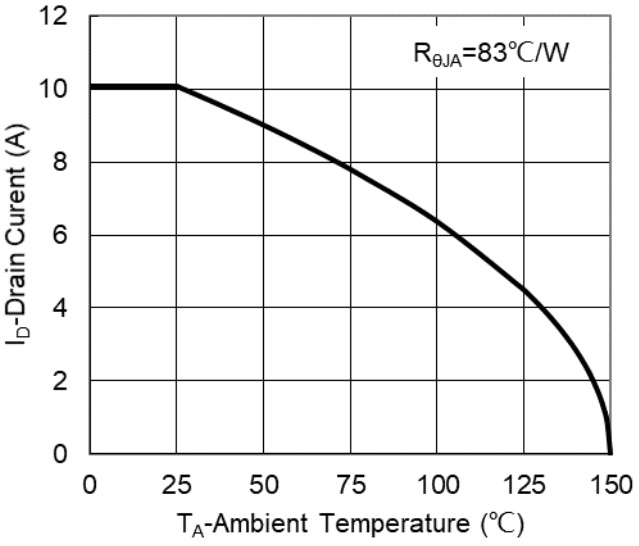


Figure8. Maximum Continuous Drain Current vs Ambient Temperature

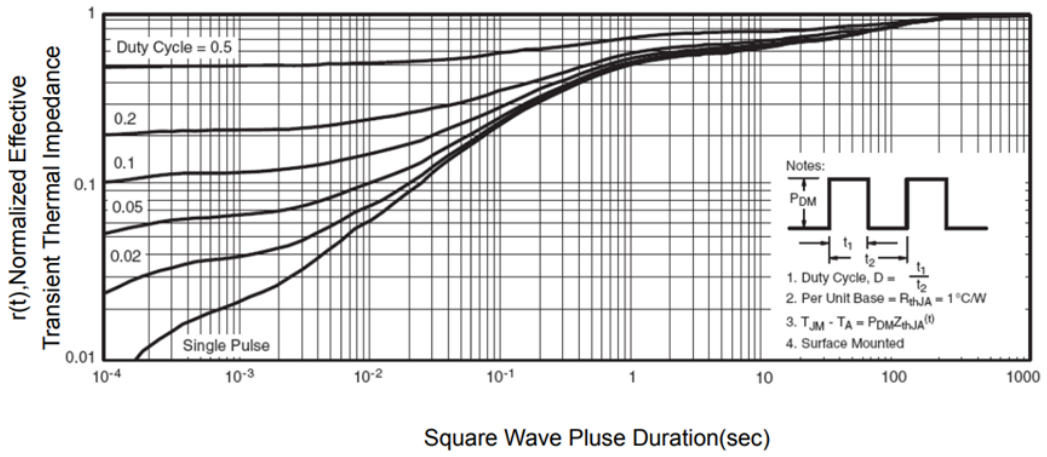
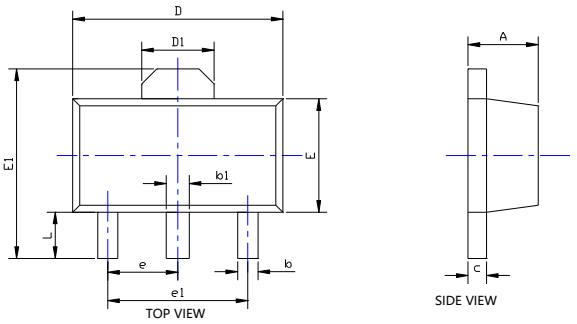
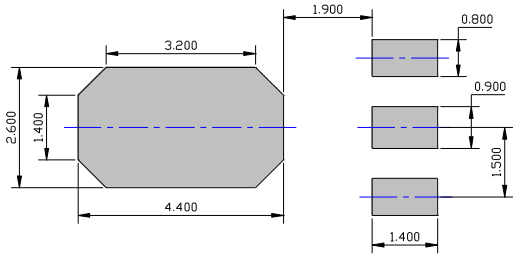


Figure9.Normalized Maximum Transient Thermal Impedance

■ SOT-89 Package information

TYPE A(PACKING CODE:F1):





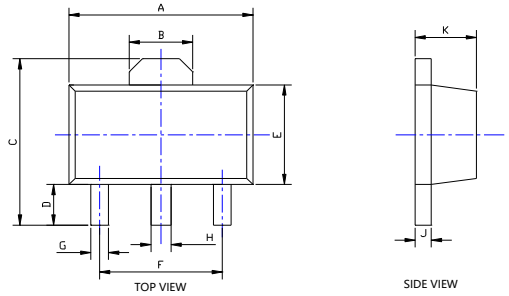
UNIT：mm

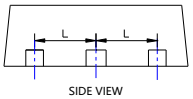
SUGGESTED SOLDER PAD LAYOUT

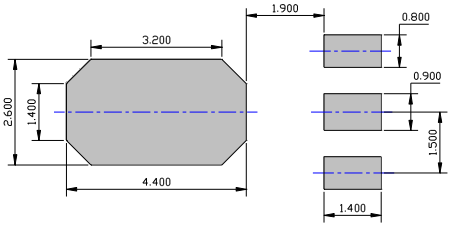
DIMENSIONS						
SYMBOL	INCHES			Millimeter		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.055	0.059	0.063	1.400	1.500	1.600
b	0.014	---	0.020	0.350	---	0.520
b1	0.016	---	0.023	0.400	---	0.580
c	0.014	---	0.017	0.350	---	0.440
D	0.173	0.177	0.181	4.400	4.500	4.600
D1	0.061REF			1.550REF		
E	0.093	0.096	0.100	2.350	2.450	2.550
E1	0.155	---	0.167	3.940	---	4.250
e	0.059TYP			1.500TYP		
e1	0.118TYP			3.000TYP		
L	0.035	0.039	0.043	0.900	1.000	1.100

NOTE:
1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
3.THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.

TYPE B(PACKING CODE:F2)：







UNIT：mm

SUGGESTED SOLDER PAD LAYOUT

DIMENSIONS				
DIM	INCHES		Millimeter	
	MIN.	MAX.	MIN.	MAX.
A	0.169	0.185	4.300	4.700
B	0.061TYP		1.550TYP	
C	0.154	0.171	3.910	4.350
D	0.031	0.047	0.800	1.200
E	0.089	0.104	2.250	2.650
F	0.118TYP		3.000TYP	
G	0.013	0.020	0.330	0.520
H	0.016	0.023	0.400	0.580
J	0.014	0.017	0.350	0.440
K	0.055	0.063	1.400	1.600
L	0.059TYP		1.500TYP	

NOTE:
1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
3.THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.

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