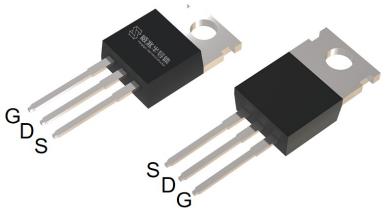
Features

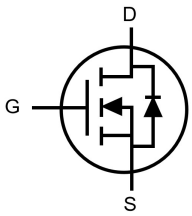
- Enhancement mode
- Very low on-resistance $R_{DS(on)}$ @ V_{GS}=10 V
- 100% Avalanche test

V_{DS}	100	V
$R_{DS(on),TYP}$@ V_{GS}=10 V	4.5	mΩ
$I_{D(Silicon\ Limited)}$	200	A
$I_{D(Package\ Limited)}$	130	A

TO-220AB



Pb-Free RoHS HF Halogen-Free



Part ID	Package Type	Marking	Packing
VS1401ATH	TO-220AB	1401ATH	50pcs/Tube

Maximum ratings, at T_A =25°C, unless otherwise specified

Symbol	Parameter		Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage		100	V
V_{GS}	Gate-Source voltage		±25	V
I_S	Diode continuous forward current	T_C = 25°C	200	A
I_D	Continuous drain current @VGS=10V (Silicon limited)	T_C = 25°C	200	A
I_D	Continuous drain current @VGS=10V (Silicon limited)	T_C = 100°C	142	A
I_D	Continuous drain current @VGS=10V (Wire bond limited)	T_C = 25°C	130	A
I_{DM}	Pulse drain current tested ①	T_C =25°C	800	A
I_{DSM}	Continuous drain current @VGS=10V	T_A=25°C	15	A
		T_A=70°C	12	A
EAS	Avalanche energy, single pulsed ②		900	mJ
P_D	Maximum power dissipation	T_C =25°C	375	W
P_{DSM}	Maximum power dissipation ③	T_A=25°C	2	W
T_{STG},T_J	Storage and Junction Temperature Range		-55 to 175	°C

Thermal Characteristics

Symbol	Parameter	Typical	Max	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.4	0.5	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62.5	75	°C/W

Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ T_j=25°C (unless otherwise stated)						
$V_{(BR)DSS}$	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	μA
	Zero Gate Voltage Drain Current(T_j=125℃)	V_{DS}=100V,V_{GS}=0V	--	--	100	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±25V,V_{DS}=0V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	2.4	3	3.6	V
$R_{DS(on)}$	Drain-Source On-State Resistance ④	V_{GS}=10V, I_D=80A	--	4.5	5.5	mΩ
		T_j=100℃	--	6.5	--	mΩ
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated)						
Ciss	Input Capacitance	V_{DS}=30V,V_{GS}=0V, f=1MHz	11065	14755	19625	pF
Coss	Output Capacitance		500	665	885	pF
Crss	Reverse Transfer Capacitance		370	495	660	pF
Rg	Gate Resistance	f=1MHz	0.2	2.3	5	Ω
Qg	Total Gate Charge	V_{DS}=50V,I_D=40A, V_{GS}=10V	--	232	309	nC
Qgs	Gate-Source Charge		--	59	78	nC
Qgd	Gate-Drain Charge		--	60	90	nC
Switching Characteristics						
Td(on)	Turn-on Delay Time	V_{DD}=50V, I_D=40A, R_G=3Ω, V_{GS}=10V	--	35	--	ns
Tr	Turn-on Rise Time		--	67	--	ns
Td(off)	Turn-Off Delay Time		--	128	--	ns
Tf	Turn-Off Fall Time		--	64	--	ns
Source- Drain Diode Characteristics@ T_j = 25°C (unless otherwise stated)						
V_{SD}	Forward on voltage	I_{SD}=80A,V_{GS}=0V	--	0.9	1.2	V
Trr	Reverse Recovery Time	T_j=25℃,I_{sd}=40A, V_{GS}=0V di/dt=100A/μs	--	44	88	ns
Qrr	Reverse Recovery Charge		--	77	154	nC

NOTE: ① Repetitive rating; pulse width limited by max junction temperature.

② Limited by T_{Jmax}, starting T_J = 25°C, L = 0.5mH, R_G = 25Ω, I_{AS} = 60A, V_{GS} =10V. Part not recommended for use above this value

③ The power dissipation P_{DSM} is based on $R_{\theta JA}$ and the maximum allowed junction temperature of 150°C.

④ Pulse width ≤ 380μs; duty cycle≤ 2%.

Typical Characteristics

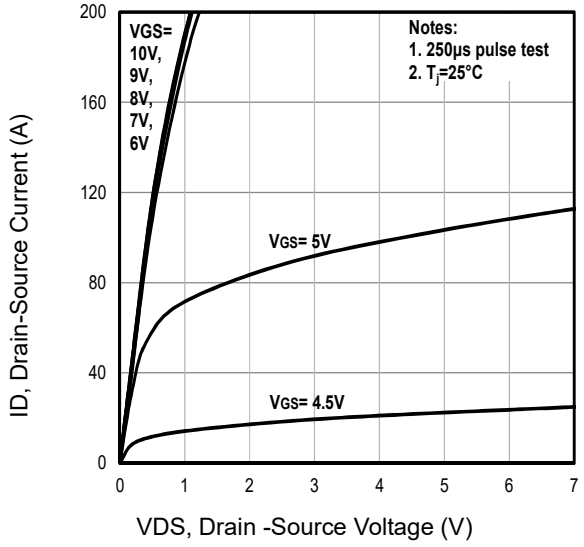


Fig1. Typical Output Characteristics

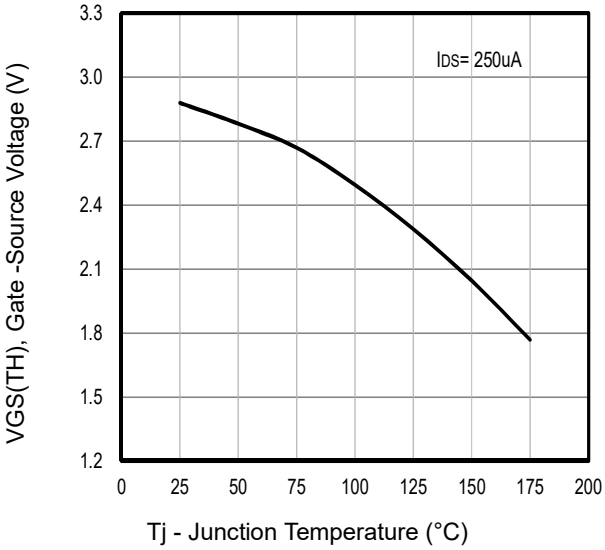


Fig2. $V_{GS(TH)}$ Gate -Source Voltage Vs. Tj

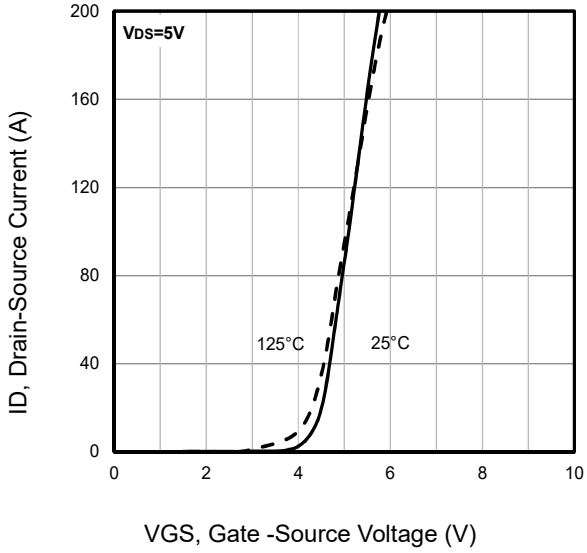


Fig3. Typical Transfer Characteristics

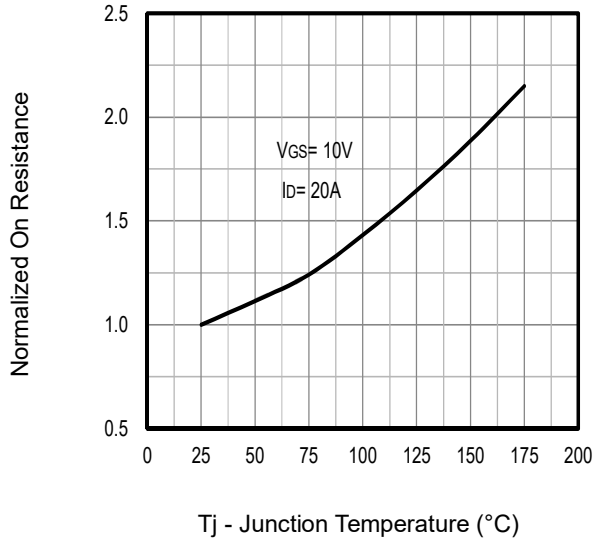


Fig4. Normalized On-Resistance Vs. Tj

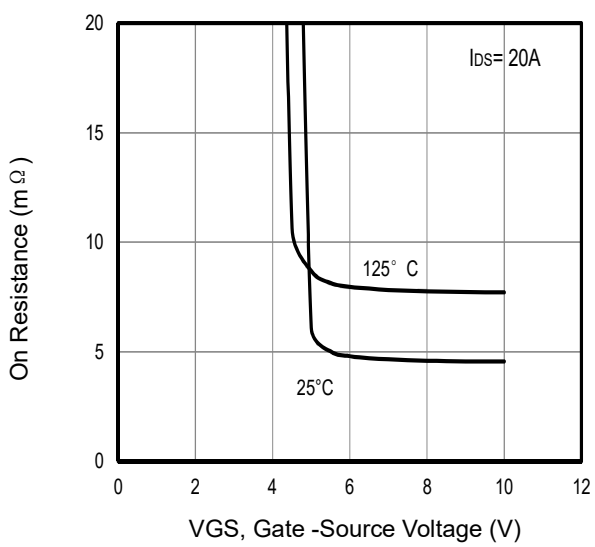


Fig5. On Resistance Vs Gate -Source Voltage

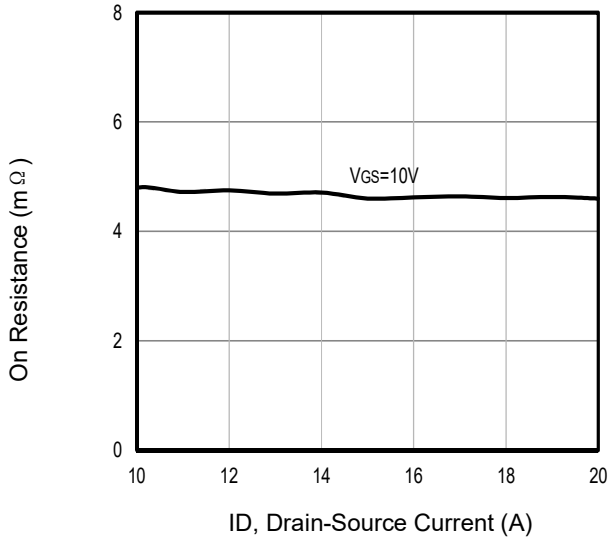


Fig6. On Resistance Vs Drain Current and Gate Voltage

Typical Characteristics

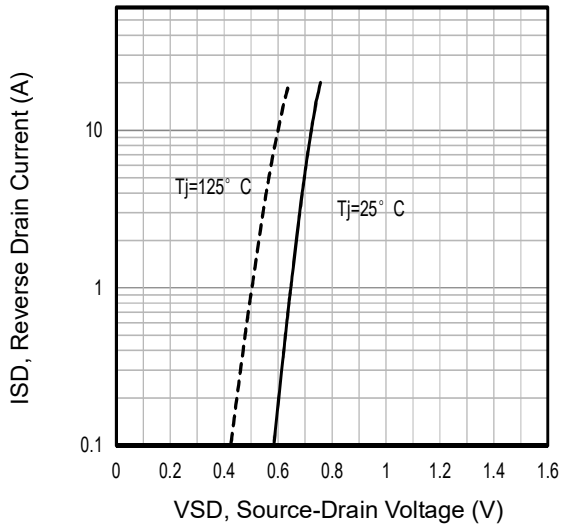


Fig7. Typical Source-Drain Diode Forward Voltage

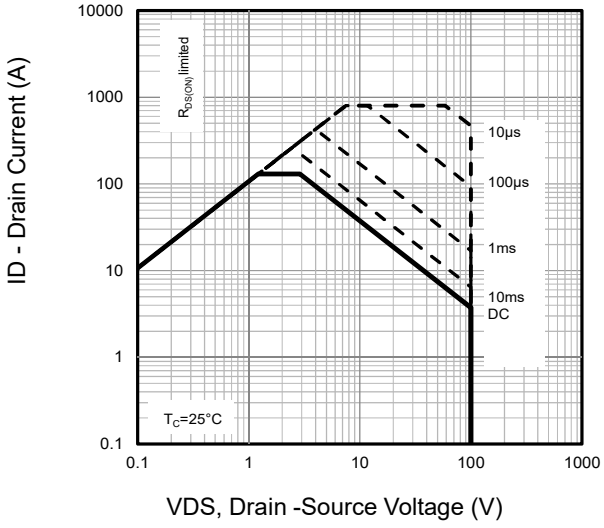


Fig8. Maximum Safe Operating Area

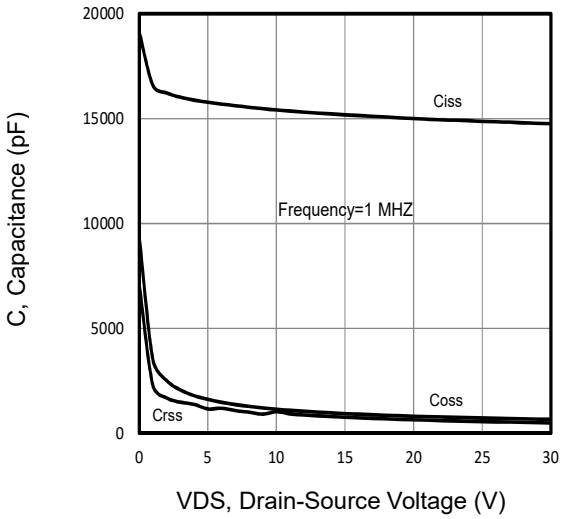


Fig9. Typical Capacitance Vs. Drain-Source Voltage

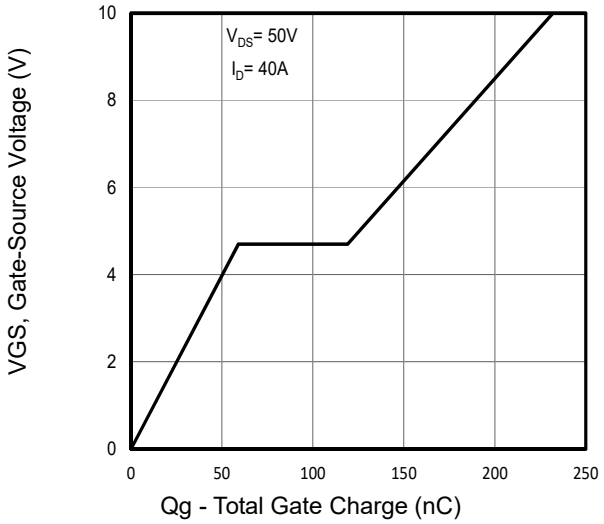


Fig10. Typical Gate Charge Vs. Gate-Source Voltage

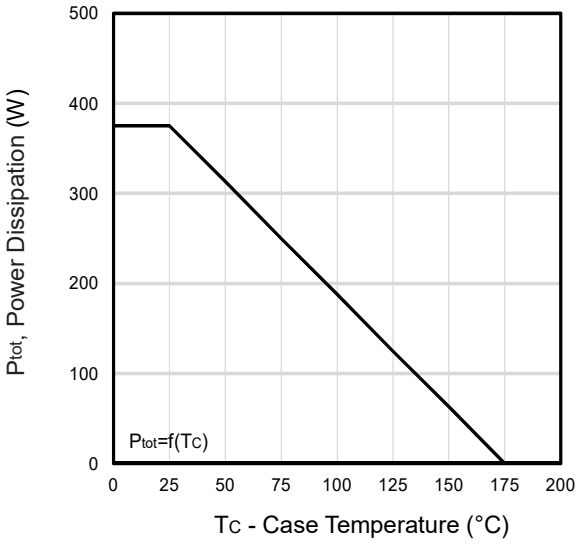


Fig11. Power Dissipation Vs. Case Temperature

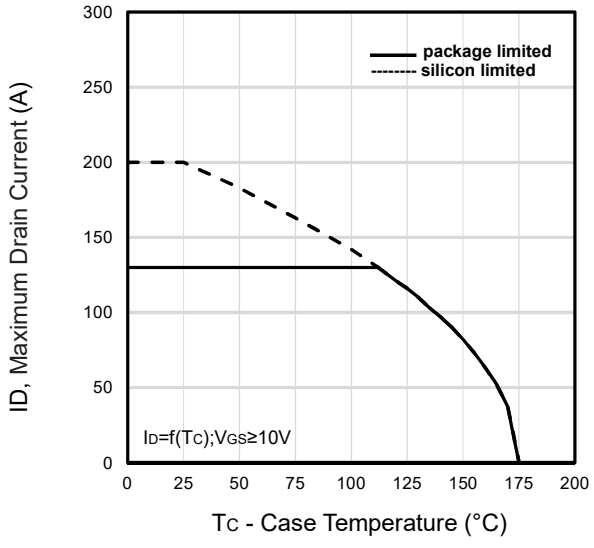


Fig12. Maximum Drain Current Vs. Case Temperature

Typical Characteristics

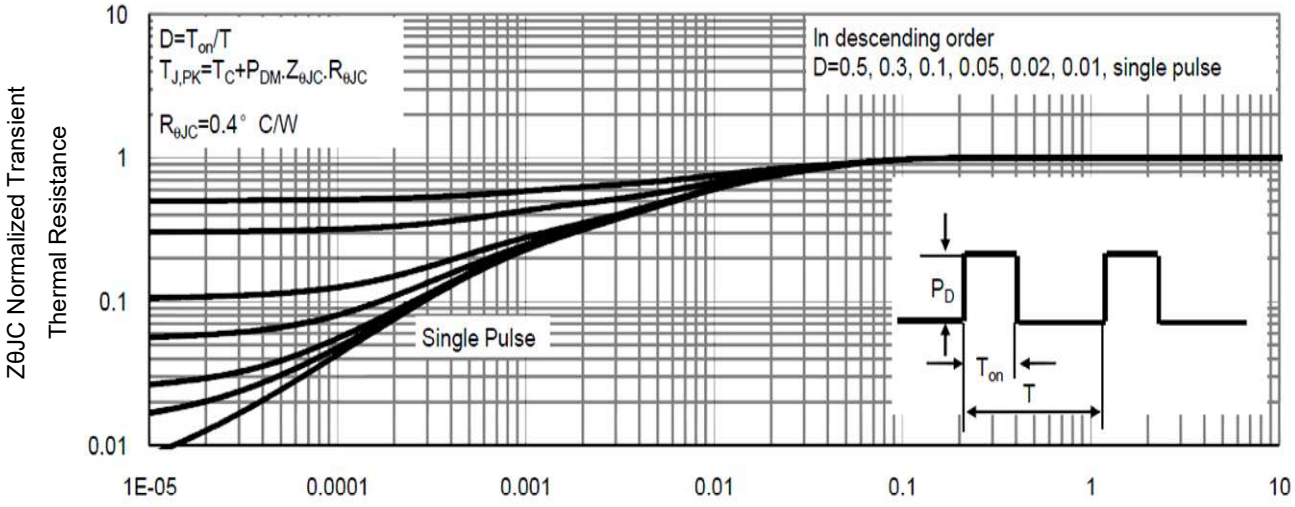


Fig13 . Normalized Maximum Transient Thermal Impedance

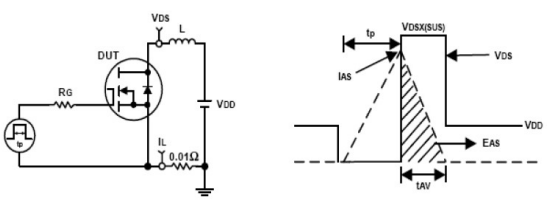


Fig14. Unclamped Inductive Test Circuit and waveforms

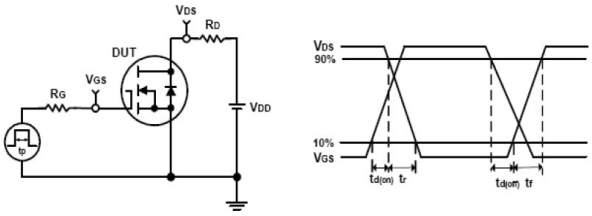
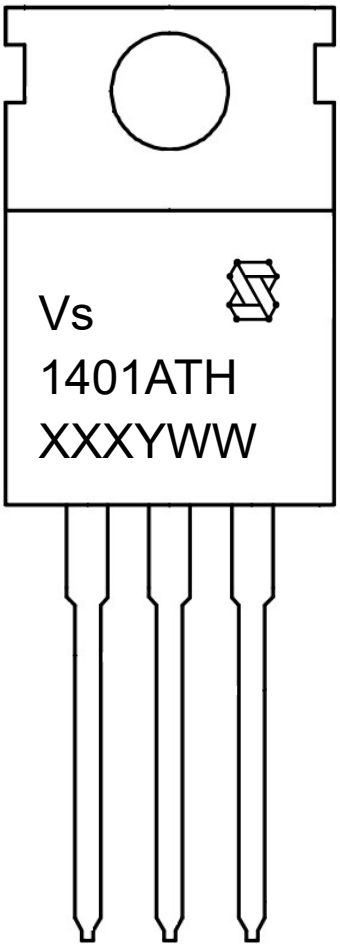


Fig15. Switching Time Test Circuit and waveforms

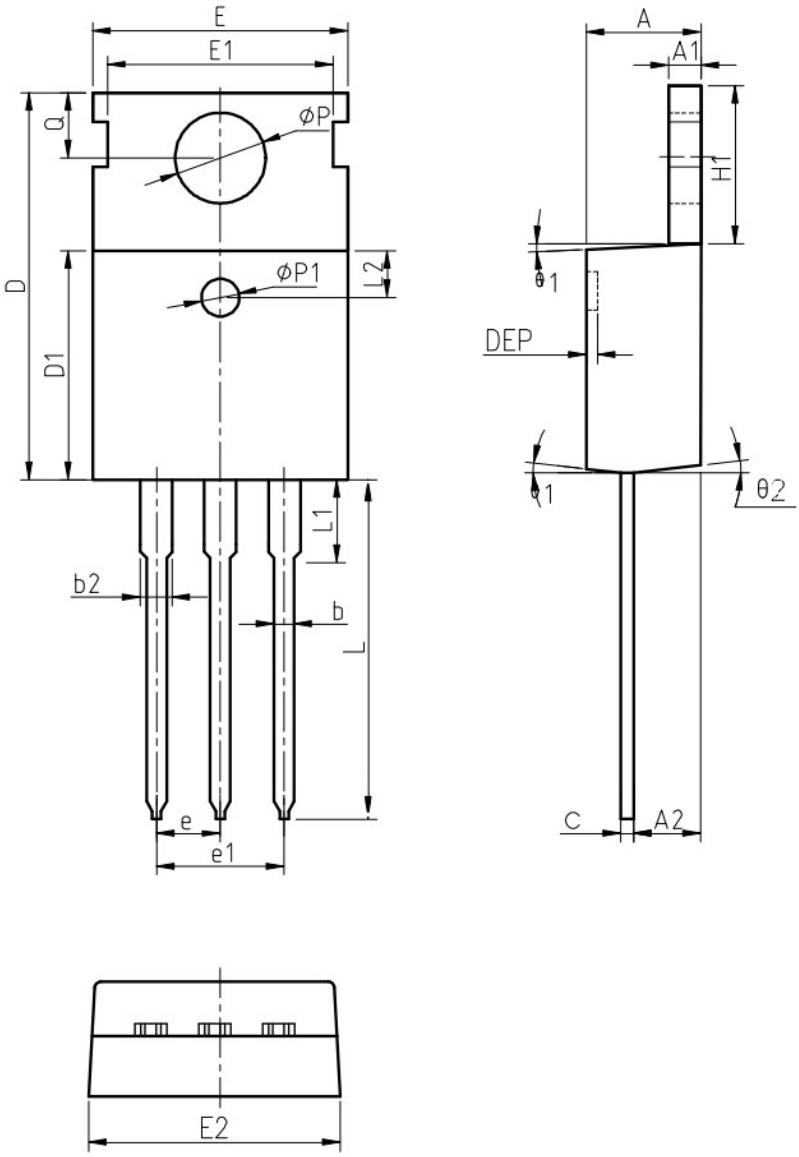
Marking Information



1st line: Vergiga Code（Vs）， Vergiga Logo
2nd line: Part Number（1401ATH）
3rd line: Date code （XXXYWW）
XXX: Wafer Lot Number Code , code changed with Lot Number
Y: Year Code, refer to table below
WW: Week Code (01 to 53)

Code	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030

TO-220AB Package Outline Data



Symbol	Dimensions (unit: mm)		
	Min	Typ	Max
A	4.30	4.52	4.70
A1	1.15	1.30	1.40
A2	2.20	2.40	2.60
b	0.70	0.80	1.00
b2	1.17	1.32	1.50
c	0.45	0.50	0.61
D	15.30	15.65	15.90
D1	9.00	9.20	9.40
DEP	0.05	0.10	0.25
E	9.66	9.90	10.28
E1	-	8.70	-
E2	9.80	10.00	10.20
ΦP1	1.40	1.50	1.60
e	2.54 BSC		
e1	5.08 BSC		
H1	6.40	6.50	6.80
L	12.70	-	14.27
L1	-	-	3.95
L2	2.40	2.50	2.60
ΦP	3.53	3.60	3.70
Q	2.70	2.80	2.90
θ1	5 °	7 °	9 °
θ2	1 °	3 °	5 °

Notes:

1. Refer to JEDEC TO-220 variation AB
2. Dimension "D" and "E" do NOT include mold flash. Mold flash shall not exceed 0.127mm per side.

Customer Service

Sales and Service:

sales@vgsemi.com

Vergiga Semiconductor CO., LTD

TEL: (86-755) -26902410

FAX: (86-755) -26907027

WEB: www.vgsemi.com

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for MOSFET ***category:***

Click to view products by Vanguard ***manufacturer:***

Other Similar products are found below :

614233C 648584F IRFD120 IRFF430 JANTX2N5237 2N7000 FCA20N60_F109 FDZ595PZ AOD464 2SK2267(Q) 2SK2545(Q,T) 405094E 423220D MIC4420CM-TR VN1206L 614234A 715780A SSM6J414TU,LF(T 751625C PSMN4R2-30MLD TK31J60W5,S1VQ(O 2SK2614(TE16L1,Q) DMN1017UCP3-7 EFC2J004NUZTDG FCAB21350L1 P85W28HP2F-7071 DMN1053UCP4-7 NTE2384 NTE2969 NTE6400A DMN2080UCB4-7 DMN61D9UWQ-13 US6M2GTR DMN31D5UDJ-7 SSM6P54TU,LF DMP22D4UFO-7B IPS60R3K4CEAKMA1 DMN1006UCA6-7 DMN16M9UCA6-7 STF5N65M6 STU5N65M6 C3M0021120D DMN13M9UCA6-7 BSS340NWH6327XTSA1 MCM3400A-TP DMTH10H4M6SPS-13 IRF40SC240ARMA1 IPS60R1K0PFD7SAKMA1 IPS60R360PFD7SAKMA1 IPS60R600PFD7SAKMA1