AP95T10AGI-HF-VB Datasheet

N-Channel 100 V (D-S) 175 °C MOSFET

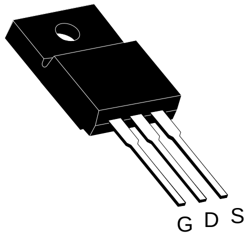
PRODUCT SUMMARY	
V_{DS} (V)	100
$R_{DS(on)}$ (Ω) at V_{GS} = 10 V	0.0038
I_D (A)	120
Configuration	Single

FEATURES

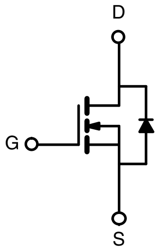
- TrenchFET® Power MOSFET
- Package with Low Thermal Resistance
- 100 % R_g and UIS Tested

RoHS
COMPLIANT
HALOGEN
FREE

TO-220 FULLPAK



Top View



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_C = 25 °C, unless otherwise noted)				
PARAMETER		**SYMBOL**	**LIMIT**	**UNIT**
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current	T_C = 25 °C[a]	I_D	120	A
	T_C = 125 °C		102	
Continuous Source Current (Diode Conduction)[a]		I_S	120	
Pulsed Drain Current[b]		I_{DM}	480	
Single Pulse Avalanche Current	L = 0.1 mH	I_{AS}	73	
Single Pulse Avalanche Energy		E_{AS}	266	mJ
Maximum Power Dissipation[b]	T_C = 25 °C	P_D	84	W
	T_C = 125 °C		35	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to + 175	°C

THERMAL RESISTANCE RATINGS				
PARAMETER		**SYMBOL**	**LIMIT**	**UNIT**
Junction-to-Ambient	PCB Mount[c]	R_{thJA}	40	°C/W
Junction-to-Case (Drain)		R_{thJC}	0.6	

Notes

a. Package limited.
b. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.
c. When mounted on 1" square PCB (FR-4 material).
d. Parametric verification ongoing.

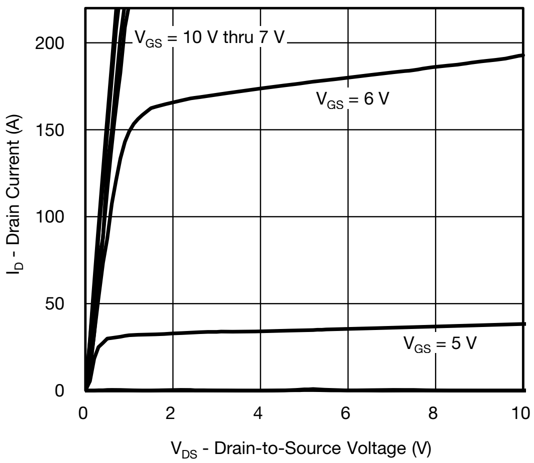
SPECIFICATIONS (T_C = 25 °C, unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT
Static							
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0, I_D = 250 μA		100	-	-	V
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 250 μA		2.5	3.0	3.5	
Gate-Source Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V		-	-	± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS} = 0 V	V_{DS} = 100 V	-	-	1	μA
		V_{GS} = 0 V	V_{DS} = 100 V, T_J = 125 °C	-	-	50	
		V_{GS} = 0 V	V_{DS} = 100 V, T_J = 175 °C	-	-	500	
On-State Drain Current[a]	$I_{D(on)}$	V_{GS} = 10 V	$V_{DS} \geq 5$ V	120	-	-	A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = 10 V	I_D = 20 A	-	0.0038	-	Ω
		V_{GS} = 10 V	I_D = 20 A, T_J = 125 °C	-	0.0064	-	
		V_{GS} = 10 V	I_D = 20 A, T_J = 175 °C	-	0.0080	-	
Forward Transconductance[b]	g_{fs}	V_{DS} = 15 V, I_D = 20 A		-	82	-	S
Dynamic[b]							
Input Capacitance	C_{iss}	V_{GS} = 0 V	V_{DS} = 25 V, f = 1 MHz	-	5780	7230	pF
Output Capacitance	C_{oss}			-	3070	3840	
Reverse Transfer Capacitance	C_{rss}			-	305	385	
Total Gate Charge[c]	Q_g	V_{GS} = 10 V	V_{DS} = 50 V, I_D = 70 A	-	125	190	nC
Gate-Source Charge[c]	Q_{gs}			-	28	-	
Gate-Drain Charge[c]	Q_{gd}			-	46	-	
Gate Resistance	R_g	f = 1 MHz		1.6	3.3	5	Ω
Turn-On Delay Time[c]	$t_{d(on)}$	V_{DD} = 50 V, R_L = 0.7 Ω $I_D \cong$ 70 A, V_{GEN} = 10 V, R_g = 1 Ω		-	16	25	ns
Rise Time[c]	t_r			-	110	165	
Turn-Off Delay Time[c]	$t_{d(off)}$			-	40	60	
Fall Time[c]	t_f			-	12	20	
Source-Drain Diode Ratings and Characteristics[b]							
Pulsed Current[a]	I_{SM}			-	-	480	A
Forward Voltage	V_{SD}	I_F = 100 A, V_{GS} = 0		-	0.9	1.5	V

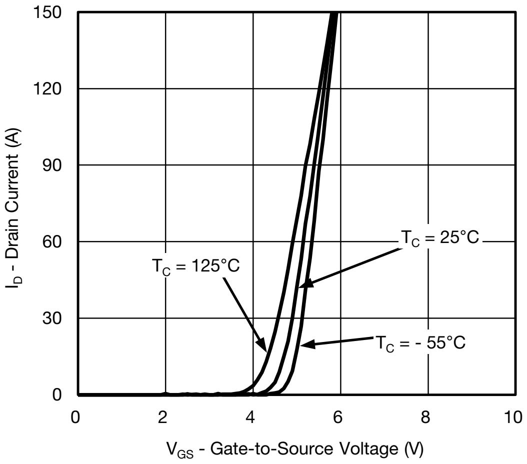
Notes

a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.
c. Independent of operating temperature.

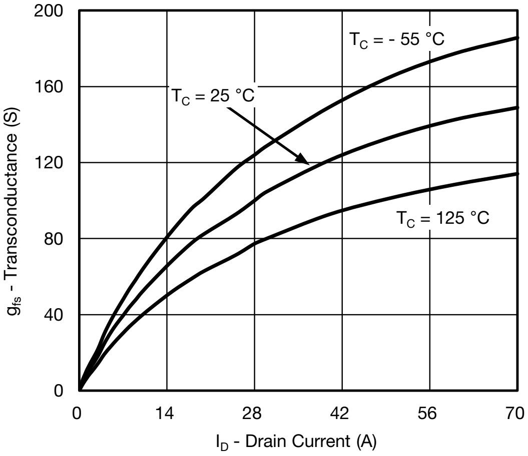
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



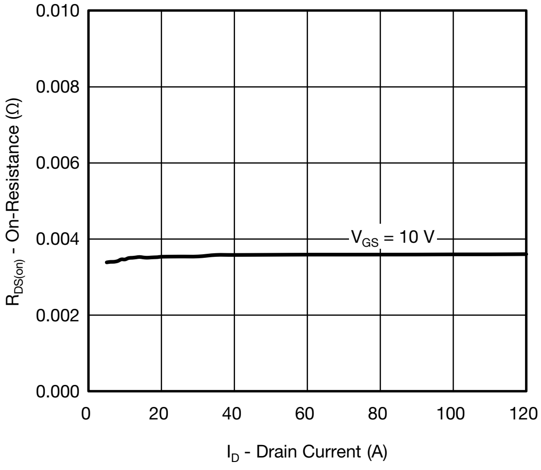
Output Characteristics



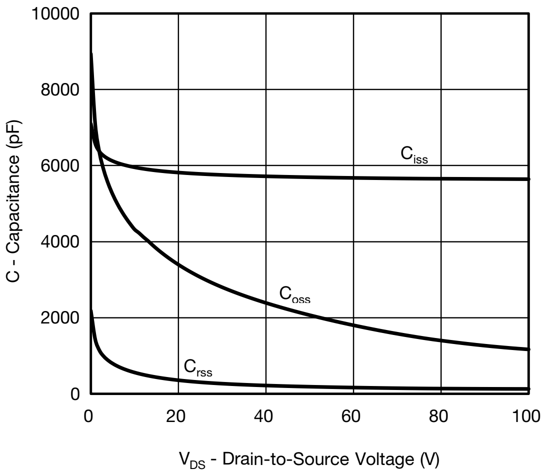
Transfer Characteristics



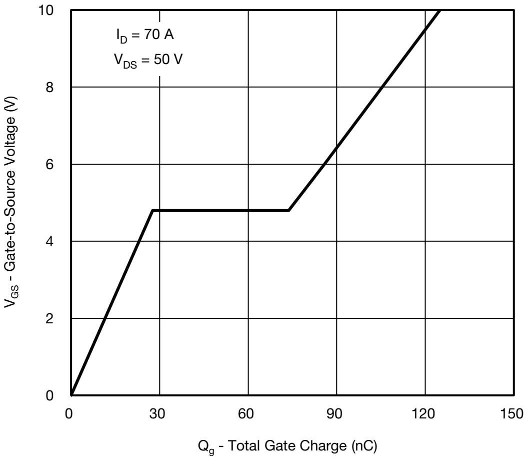
Transconductance



On-Resistance vs. Drain Current

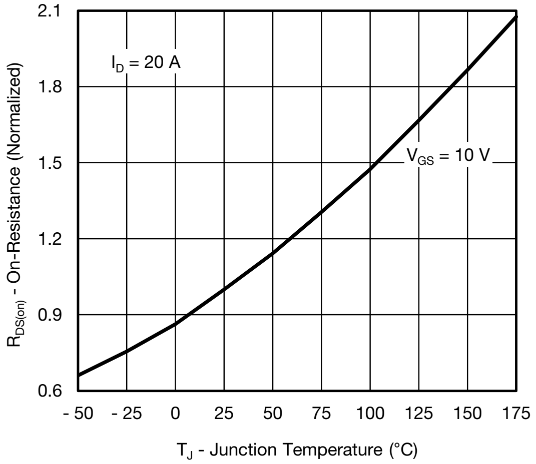


Capacitance

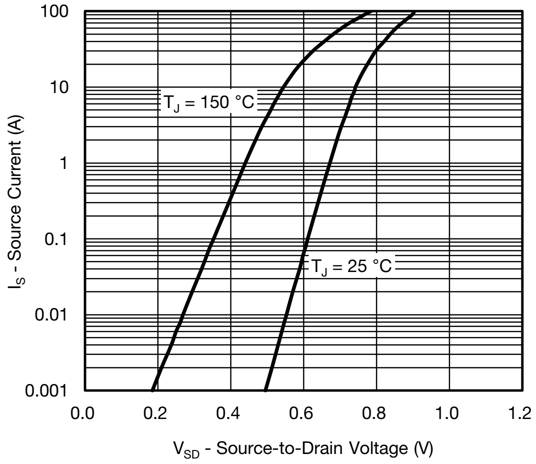


Gate Charge

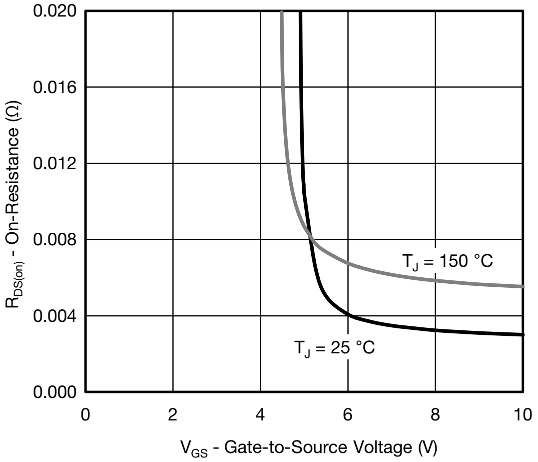
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



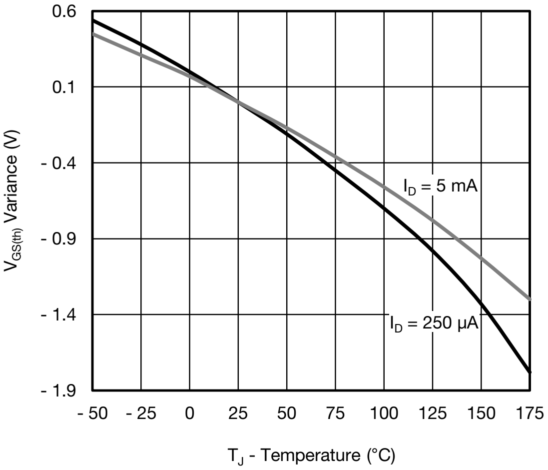
On-Resistance vs. Junction Temperature



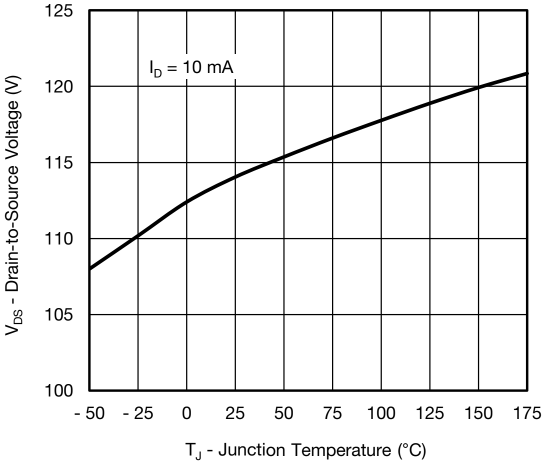
Source Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage

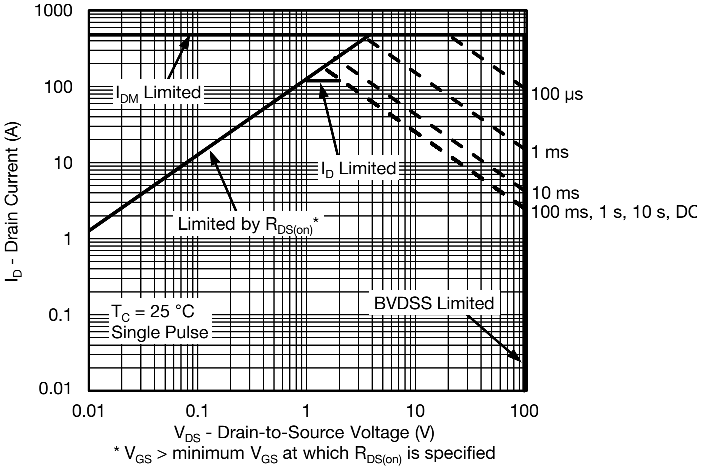


Threshold Voltage

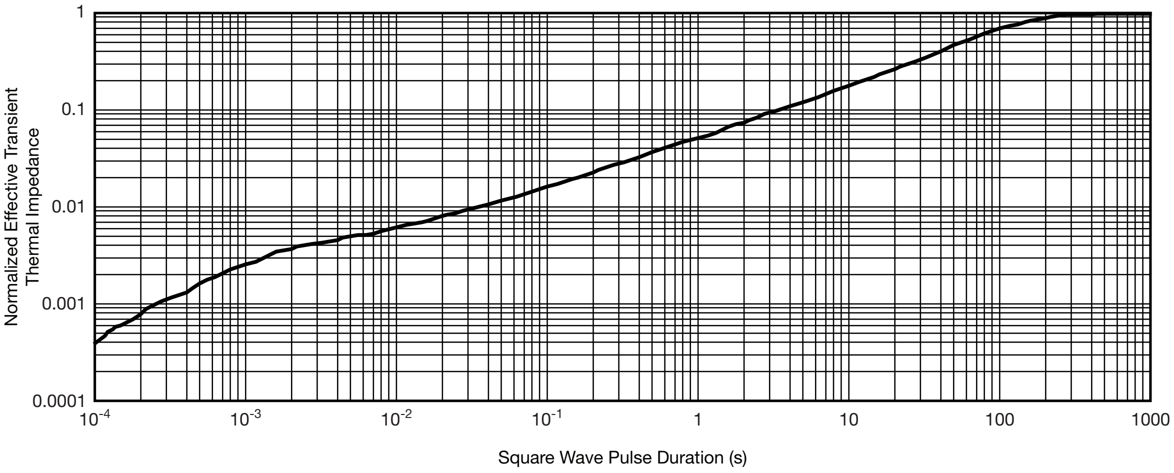


Drain Source Breakdown vs. Junction Temperature

THERMAL RATINGS (T_A = 25 °C, unless otherwise noted)

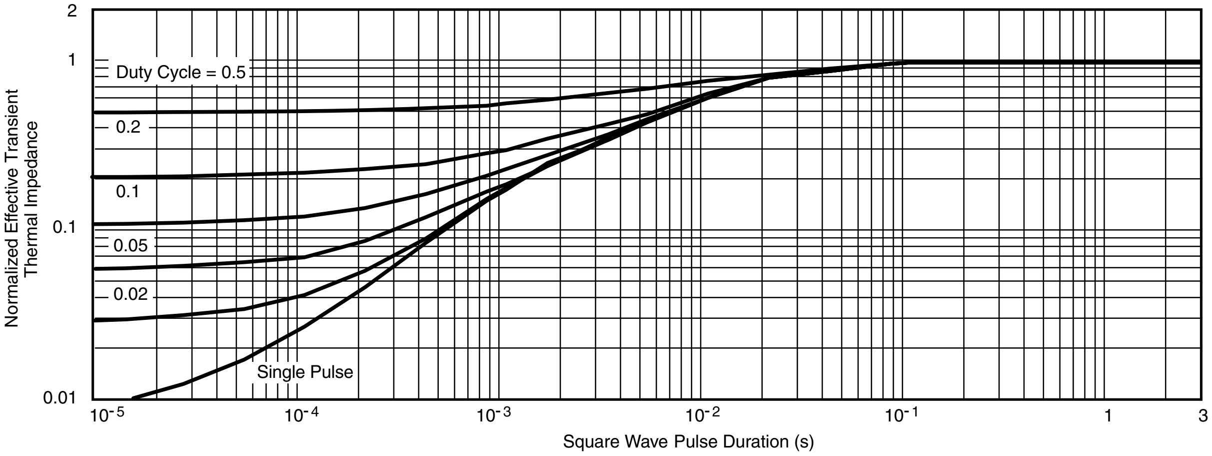


Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Ambient

THERMAL RATINGS (T_A = 25 °C, unless otherwise noted)



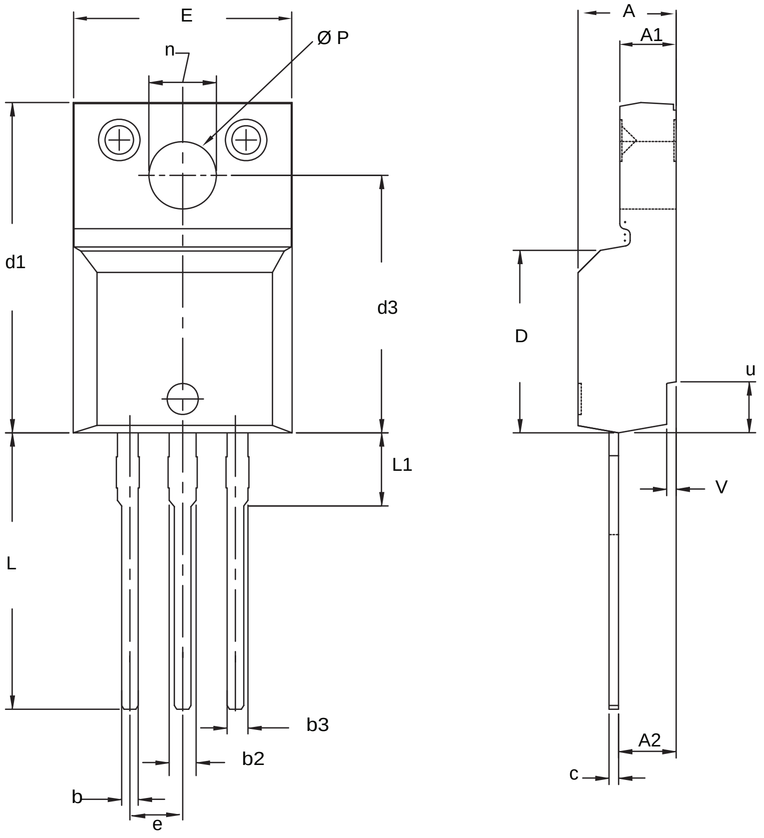
Normalized Thermal Transient Impedance, Junction-to-Case

Note

- The characteristics shown in the two graphs
  - Normalized Transient Thermal Impedance Junction to Ambient (25 °C)
  - Normalized Transient Thermal Impedance Junction to Case (25 °C)

  are given for general guidelines only to enable the user to get a “ball park” indication of part capabilities. The data are extracted from single pulse transient thermal impedance characteristics which are developed from empirical measurements. The latter is valid for the part mounted on printed circuit board - FR4, size 1" x 1" x 0.062", double sided with 2 oz. copper, 100 % on both sides. The part capabilities can widely vary depending on actual application parameters and operating conditions.

TO-220 FULLPAK (HIGH VOLTAGE)



	MILLIMETERS		INCHES	
DIM.	MIN.	MAX.	MIN.	MAX.
A	4.570	4.830	0.180	0.190
A1	2.570	2.830	0.101	0.111
A2	2.510	2.850	0.099	0.112
b	0.622	0.890	0.024	0.035
b2	1.229	1.400	0.048	0.055
b3	1.229	1.400	0.048	0.055
c	0.440	0.629	0.017	0.025
D	8.650	9.800	0.341	0.386
d1	15.88	16.120	0.622	0.635
d3	12.300	12.920	0.484	0.509
E	10.360	10.630	0.408	0.419
e	2.54 BSC		0.100 BSC	
L	13.200	13.730	0.520	0.541
L1	3.100	3.500	0.122	0.138
n	6.050	6.150	0.238	0.242
Ø P	3.050	3.450	0.120	0.136
u	2.400	2.500	0.094	0.098
v	0.400	0.500	0.016	0.020
ECN: X09-0126-Rev. B, 26-Oct-09 DWG: 5972				

Notes

1. To be used only for process drawing.
2. These dimensions apply to all TO-220, FULLPAK leadframe versions 3 leads.
3. All critical dimensions should C meet $C_{pk} > 1.33$.
4. All dimensions include burrs and plating thickness.
5. No chipping or package damage.

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