

AP70T03AP-VB Datasheet N-Channel 30 V (D-S) MOSFET

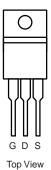
PRODUCT SUMMARY					
V _{DS} (V)	30				
$R_{DS(on)}(\Omega)$ at $V_{GS} = 10 \text{ V}$	0. 007				
$R_{DS(on)}(\Omega)$ at $V_{GS} = 4.5 \text{ V}$	0. 010				
I _D (A)	70				
Configuration	Single				
Package	TO-220AB				

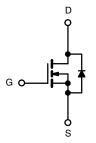
FEATURES

- Trench power MOSFET
- Package with low thermal resistance
- \bullet 100 % R_{g} and UIS tested









N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T _C = 25 °C, unless otherwise noted)					
PARAMETER		SYMBOL	LIMIT	UNIT	
Drain-Source Voltage		V _{DS}	30	V	
Gate-Source Voltage		V_{GS}	± 20	V	
Continuous Drain Current	T _C = 25 °C ^a	1-	70		
	T _C = 125 °C	- I _D	50		
Continuous Source Current (Diode Conduction) a		I _S	70	Α	
Pulsed Drain Current ^b		I _{DM}	250		
Single Pulse Avalanche Current	L = 0.1 mH	I _{AS}	33		
Single Pulse Avalanche Energy	L = 0.1 111111	E _{AS}	54	mJ	
Maximum Power Dissipation ^b	T _C = 25 °C	- P _D	71	W	
	T _C = 125 °C		23	VV	
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}	50	°C/W		
Junction-to-Case (Drain)		R _{thJC}	2.1	C/VV		

Notes

- a. Package limited.
- b. Pulse test; pulse width $\leq 300~\mu s,~duty~cycle \leq 2~\%.$
- c. When mounted on 1" square PCB (FR4 material).

服务热线:400-655-8788

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SPECIFICATIONS ($T_C = 25$ °C,	unless otherv	vise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT	
Static								
Drain-Source Breakdown Voltage	V _{DS}	$V_{GS} = 0 \text{ V}, I_D = 250 \mu\text{A}$		30	-	-	V	
Gate-Source Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_D = 250 \mu A$		1.0		2.5	V	
Gate-Source Leakage	I _{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$		-	-	± 100	nA	
		$V_{GS} = 0 V$	V _{DS} = 30 V	-	-	1		
Zero Gate Voltage Drain Current	I _{DSS}	$V_{GS} = 0 V$	V _{DS} = 30 V, T _J = 125 °C	-	-	50	μA	
		$V_{GS} = 0 V$	V _{DS} = 30 V, T _J = 175 °C	-	-	150		
On-State Drain Current ^a	I _{D(on)}	V _{GS} = 10 V	$V_{DS} \ge 5 V$	70	-	-	Α	
		V _{GS} = 10 V	I _D = 20 A	-	0.007	-	Ω	
Drain Source On State Begintance 8		V _{GS} = 10 V	I _D = 20 A, T _J = 125 °C	-	0.010	-		
Drain-Source On-State Resistance a	R _{DS(on)}	V _{GS} = 10 V	I _D = 20 A, T _J = 175 °C	-	0.014	-		
		$V_{GS} = 4.5 \text{ V}$	I _D = 15 A	-	0.010	-		
Forward Transconductance b	9fs	V _{DS} = 15 V, I _D = 15 A		-	100	-	S	
Dynamic ^b								
Input Capacitance	C _{iss}			-	-	1500	pF	
Output Capacitance	C _{oss}	$V_{GS} = 0 V$	$V_{DS} = 25 \text{ V}, f = 1 \text{ MHz}$	-	-	260		
Reverse Transfer Capacitance	C _{rss}			-	-	95		
Total Gate Charge ^c	Qg			-	46	75		
Gate-Source Charge ^c	Q_{gs}	V _{GS} = 10 V	$V_{DS} = 20 \text{ V}, I_{D} = 50 \text{ A}$	-	10	-	nC	
Gate-Drain Charge ^c	Q _{gd}			-	8	-		
Gate Resistance	R _g	f = 1 MHz		1.3	2.8	4.5	Ω	
Turn-On Delay Time ^c	t _{d(on)}				9	15		
Rise Time ^c	t _r	$V_{DD} = 20 \text{ V}, R_L = 0.4 \Omega$ $I_D \cong 50 \text{ A}, V_{GEN} = 10 \text{ V}, R_g = 1 \Omega$		-	19	30	ns	
Turn-Off Delay Time ^c	t _{d(off)}			-	26	40		
Fall Time ^c	t _f			-	10	15		
Source-Drain Diode Ratings and Chara	acteristics ^b							
Pulsed Current ^a	I _{SM}			-	-	200	Α	
Forward Voltage	V _{SD}	I _F = 30 A, V _{GS} = 0 V		-	0.87	1.5	V	

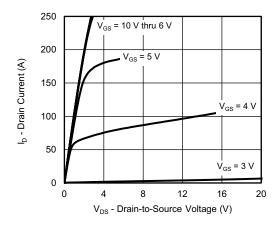
Notes

- a. Pulse test; pulse width $\leq 300~\mu s,$ duty cycle $\leq 2~\%.$
- b. Guaranteed by design, not subject to production testing.
- c. Independent of operating temperature.

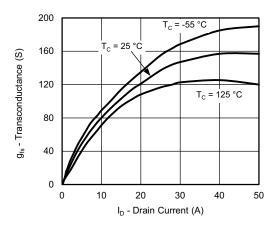
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



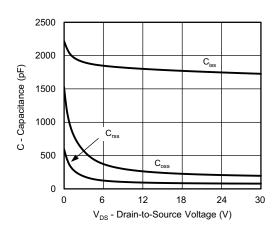
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



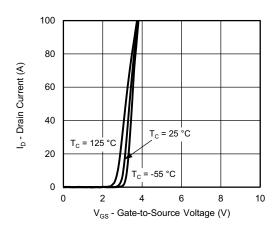
Output Characteristics



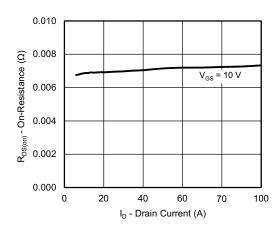
Transconductance



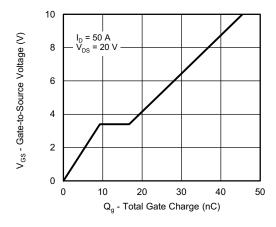
Capacitance



Transfer Characteristics



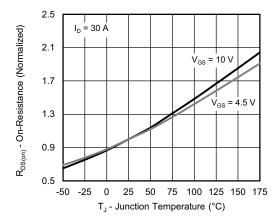
On-Resistance vs. Drain Current



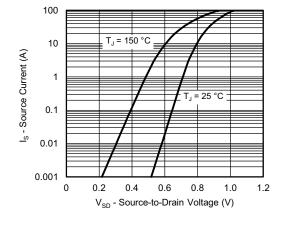
Gate Charge



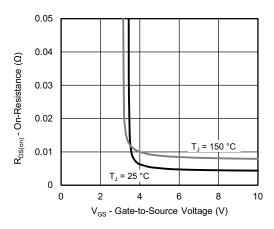
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



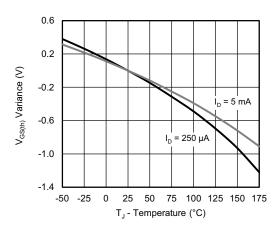
On-Resistance vs. Junction Temperature



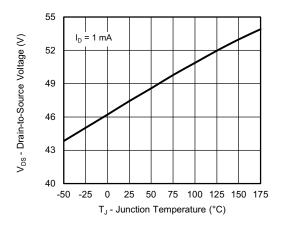
Source Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



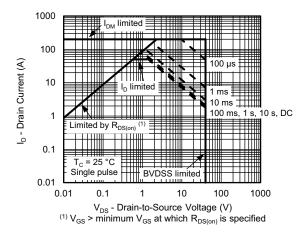
Threshold Voltage



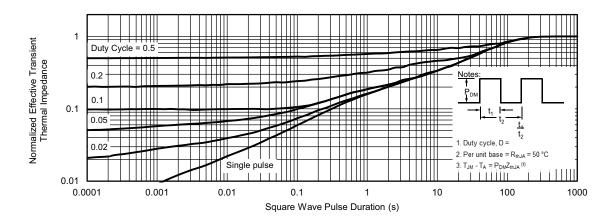
Drain Source Breakdown vs. Junction Temperature



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



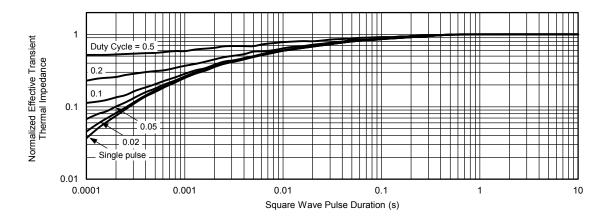
Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Ambient



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



Normalized Thermal Transient Impedance, Junction-to-Case

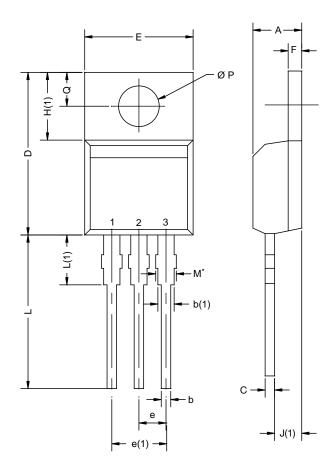
Note

- 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-220AB



	MILLIMETERS		INC	HES		
DIM.	MIN.	MAX.	MIN.	MAX.		
А	4.25	4.65	0.167	0.183		
b	0.69	1.01	0.027	0.040		
b(1)	1.20	1.73	0.047	0.068		
С	0.36	0.61	0.014	0.024		
D	14.85	15.49	0.585	0.610		
E	10.04	10.51	0.395	0.414		
е	2.41	2.67	0.095	0.105		
e(1)	4.88	5.28	0.192	0.208		
F	1.14	1.40	0.045	0.055		
H(1)	6.09	6.48	0.240	0.255		
J(1)	2.41	2.92	0.095	0.115		
L	13.35	14.02	0.526	0.552		
L(1)	3.32	3.82	0.131	0.150		
ØР	3.54	3.94	0.139	0.155		
Q	2.60	3.00	0.102	0.118		
FCN: X12-0208-Rev. N. 08-Oct-12						

ECN: X12-0208-Rev. N, 08-Oct-12 DWG: 5471

Notes

 $^{^{\}star}$ M = 1.32 mm to 1.62 mm (dimension including protrusion) Heatsink hole for HVM



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