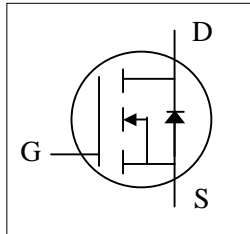




- ▼ Lower Gate Charge
- ▼ Simple Drive Requirement
- ▼ Fast Switching Characteristic
- ▼ RoHS Compliant

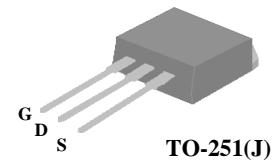
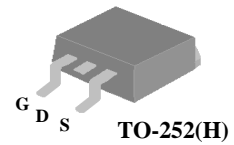


BV_{DSS}	30V
$R_{DS(ON)}$	50m Ω
I_D	12.5A

Description

AP20T03 series are from Advanced Power innovated design and silicon process technology to achieve the lowest possible on-resistance and fast switching performance. It provides the designer with an extreme efficient device for use in a wide range of power applications.

The TO-252 package is widely preferred for all commercial-industrial surface mount applications using infrared reflow technique and suited for high current application due to the low connection resistance. The through-hole version (AP20T03GJ) are available for low-profile applications.



Absolute Maximum Ratings @ $T_J=25^\circ\text{C}$ (unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	+20	V
$I_D@T_C=25^\circ\text{C}$	Drain Current, V_{GS} @ 10V	12.5	A
$I_D@T_C=100^\circ\text{C}$	Drain Current, V_{GS} @ 10V	8	A
I_{DM}	Pulsed Drain Current ¹	40	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation	12.5	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Value	Unit
Rthj-c	Maximum Thermal Resistance, Junction-case	10	$^\circ\text{C}/\text{W}$
Rthj-a	Maximum Thermal Resistance, Junction-ambient (PCB mount) ³	62.5	$^\circ\text{C}/\text{W}$
Rthj-a	Maximum Thermal Resistance, Junction-ambient	110	$^\circ\text{C}/\text{W}$



AP20T03GH/J-HF

Electrical Characteristics @ $T_j=25^{\circ}\text{C}$ (unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V, I_D=8A$	-	-	50	m Ω
		$V_{GS}=4.5V, I_D=5A$	-	-	80	m Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1	-	3	V
g_{fs}	Forward Transconductance	$V_{DS}=5V, I_D=5A$	-	6	-	S
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=30V, V_{GS}=0V$	-	-	1	μA
	Drain-Source Leakage Current ($T_j=125^{\circ}\text{C}$)	$V_{DS}=24V, V_{GS}=0V$	-	-	250	μA
I_{GSS}	Gate-Source Leakage	$V_{GS}= \pm 20V, V_{DS}=0V$	-	-	± 100	nA
Q_g	Total Gate Charge	$I_D=10A$	-	4	7	nC
Q_{gs}	Gate-Source Charge	$V_{DS}=24V$	-	1.5	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	$V_{GS}=4.5V$	-	2.3	-	nC
$t_{d(on)}$	Turn-on Delay Time	$V_{DS}=15V$	-	6	-	ns
t_r	Rise Time	$I_D=10A$	-	30	-	ns
$t_{d(off)}$	Turn-off Delay Time	$R_G=3.3\ \Omega$	-	10	-	ns
t_f	Fall Time	$V_{GS}=10V$	-	3	-	ns
C_{iss}	Input Capacitance	$V_{GS}=0V$	-	270	430	pF
C_{oss}	Output Capacitance	$V_{DS}=25V$	-	70	-	pF
C_{riss}	Reverse Transfer Capacitance	$f=1.0\text{MHz}$	-	50	-	pF
R_g	Gate Resistance	$f=1.0\text{MHz}$	-	1.6	2.4	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage ²	$I_S=5A, V_{GS}=0V$	-	-	1.3	V
t_{rr}	Reverse Recovery Time	$I_S=10A, V_{GS}=0V,$	-	16	-	ns
Q_{rr}	Reverse Recovery Charge	$dI/dt=100A/\mu s$	-	9	-	nC

Notes:

1. Pulse width limited by Max. junction temperature.
2. Pulse test
3. Surface mounted on 1 in² copper pad of FR4 board

THIS PRODUCT IS SENSITIVE TO ELECTROSTATIC DISCHARGE, PLEASE HANDLE WITH CAUTION.

USE OF THIS PRODUCT AS A CRITICAL COMPONENT IN LIFE SUPPORT OR OTHER SIMILAR SYSTEMS IS NOT AUTHORIZED.

APEC DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

APEC RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN.

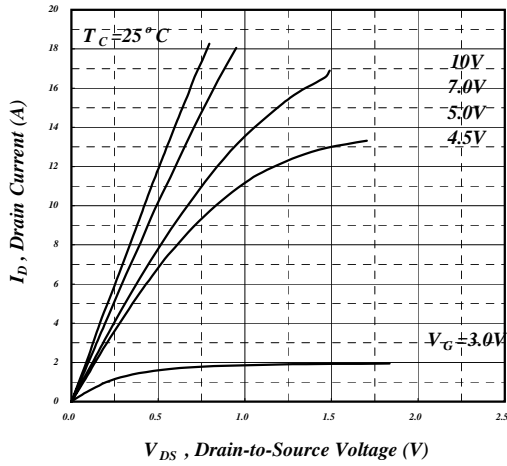


Fig 1. Typical Output Characteristics

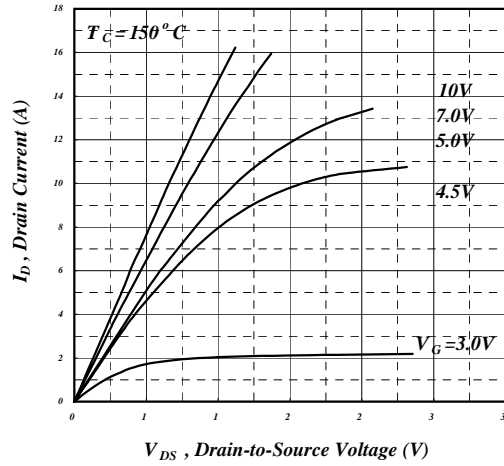


Fig 2. Typical Output Characteristics

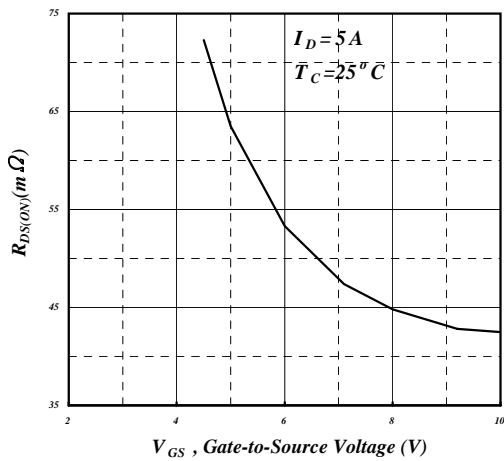


Fig 3. On-Resistance v.s. Gate Voltage

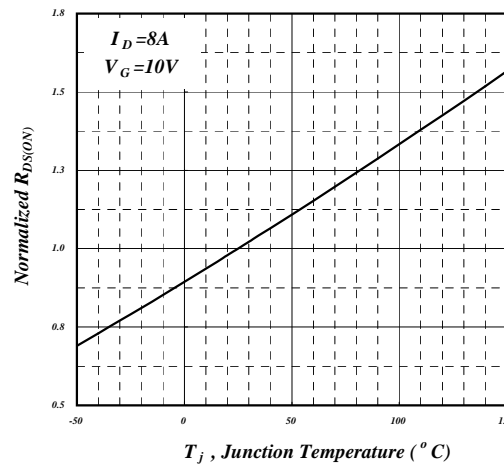


Fig 4. Normalized On-Resistance v.s. Junction Temperature

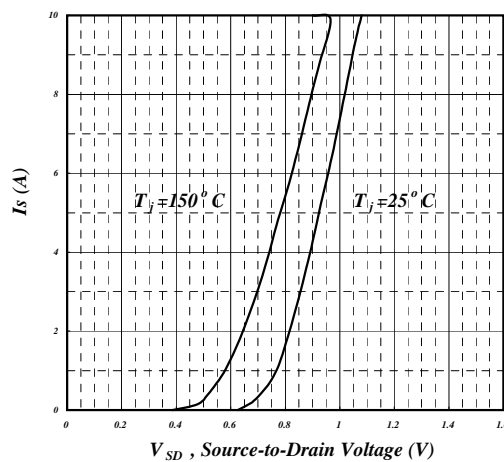


Fig 5. Forward Characteristic of Reverse Diode

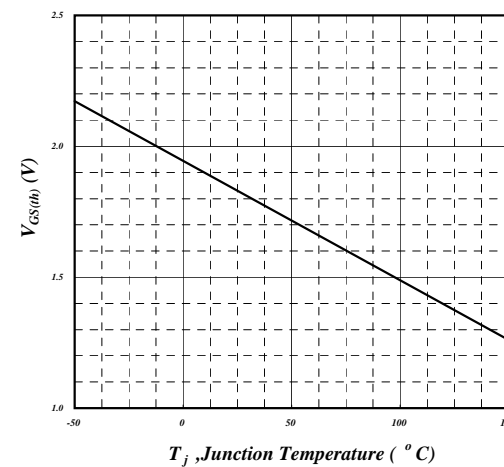


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

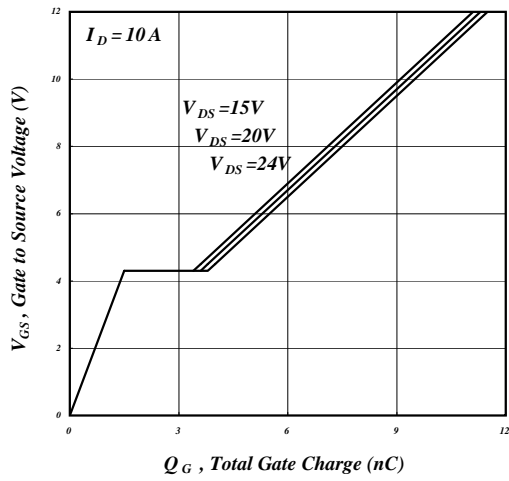


Fig 7. Gate Charge Characteristics

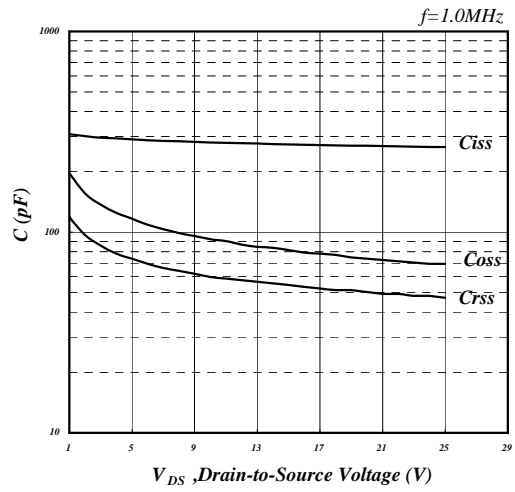


Fig 8. Typical Capacitance Characteristics

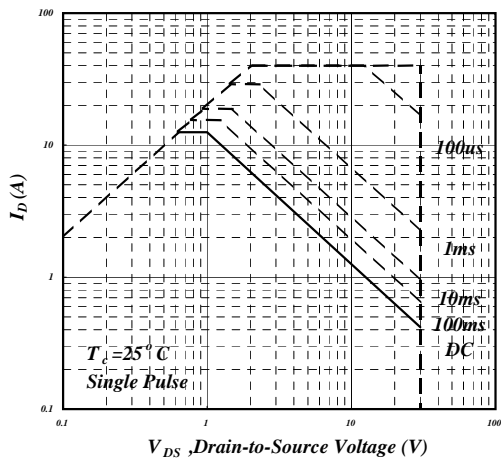


Fig 9. Maximum Safe Operating Area

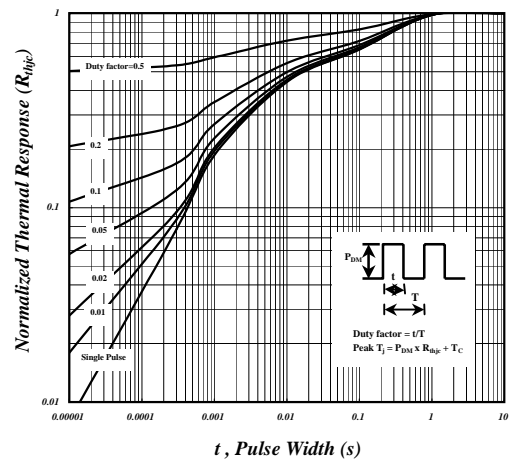


Fig 10. Effective Transient Thermal Impedance

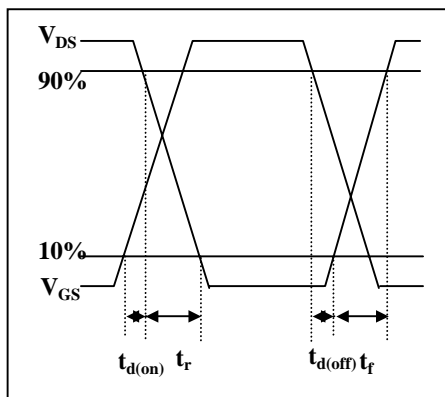


Fig 11. Switching Time Waveform

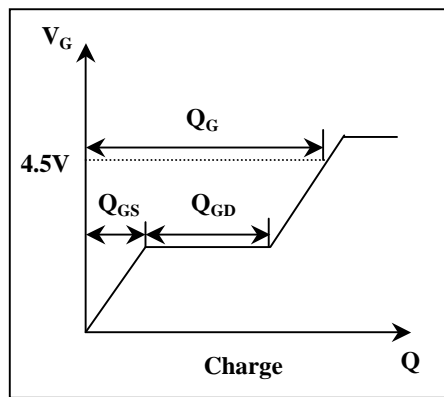
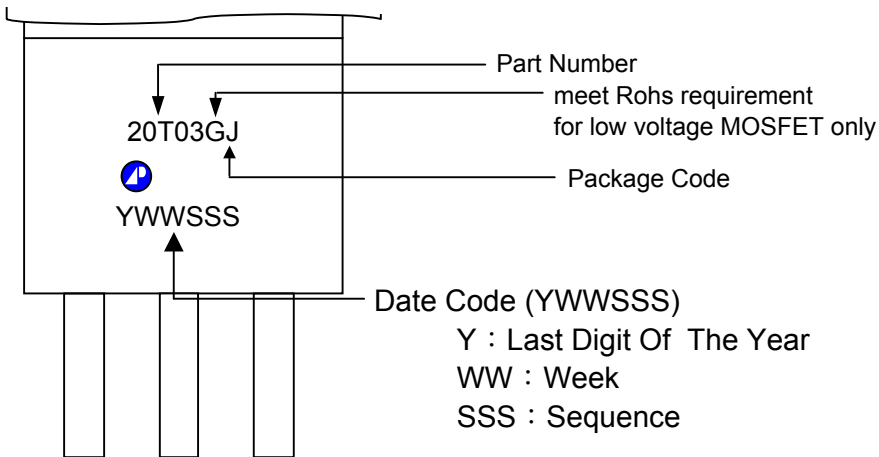


Fig 12. Gate Charge Waveform

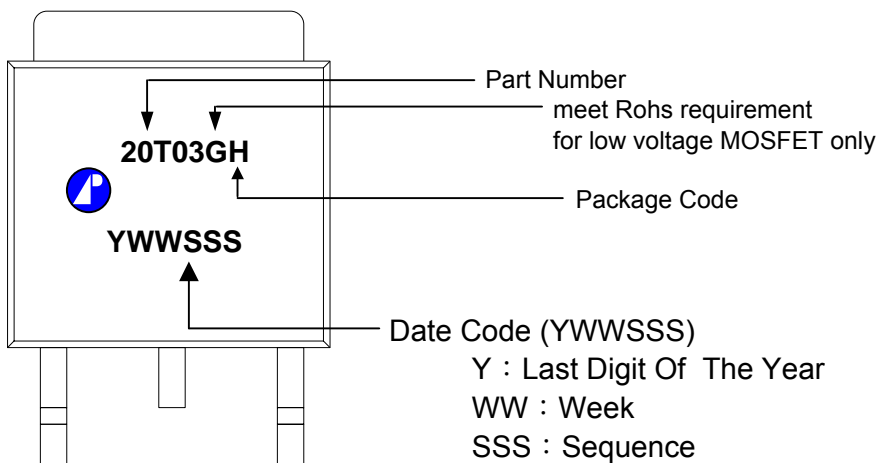


MARKING INFORMATION

TO-251

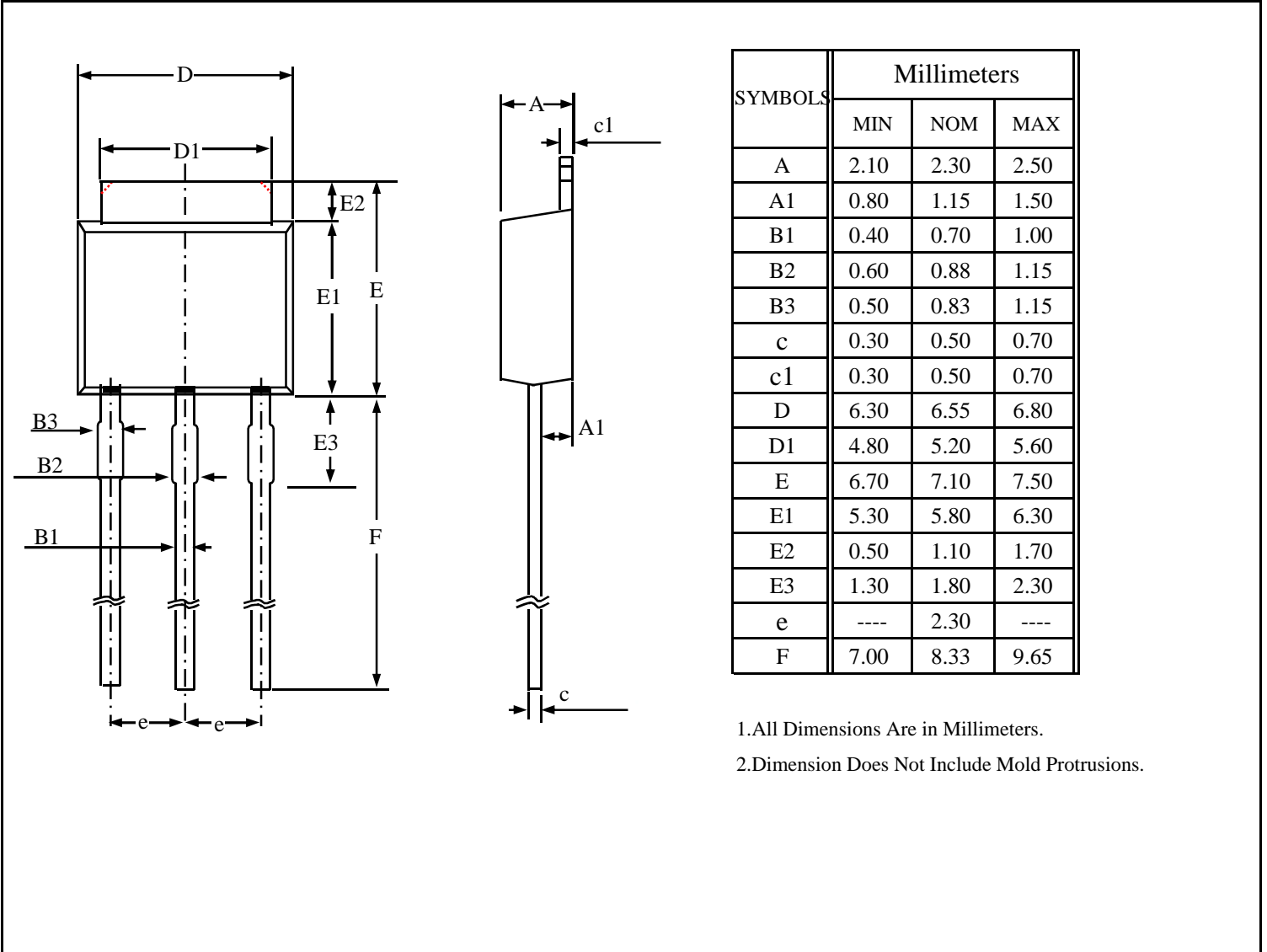


TO-252





Package Outline : TO-251



- 1.All Dimensions Are in Millimeters.
- 2.Dimension Does Not Include Mold Protrusions.



TO-251 FOOTPRINT :

