



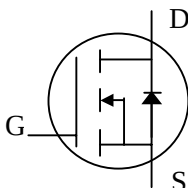
N-channel Enhancement-mode Power MOSFET

Simple Drive Requirement

100% Avalanche Tested

Fast Switching Performance

RoHS-compliant, halogen-free

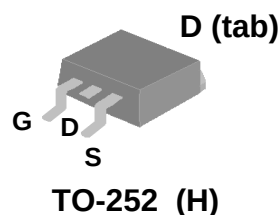


BV_{DSS}	150V
$R_{DS(ON)}$	100m Ω
I_D	20A

Description

Advanced Power MOSFETs from APEC provide the designer with the best combination of fast switching, low on-resistance and cost-effectiveness.

The AP20N15GH-HF-3 is in the TO-252 surface-mount package which is widely used in commercial and industrial applications. This device is well-suited for use in medium voltage applications such as DC-DC converters and motor drives.



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	150	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D at $T_C=25^\circ\text{C}$	Continuous Drain Current	20	A
I_D at $T_C=100^\circ\text{C}$	Continuous Drain Current	12	A
I_{DM}	Pulsed Drain Current ¹	80	A
P_D at $T_C=25^\circ\text{C}$	Total Power Dissipation	89.2	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	Units
Rthj-c	Maximum Thermal Resistance, Junction-case	1.4	$^\circ\text{C/W}$
Rthj-a	Maximum Thermal Resistance, Junction-ambient	62.5	$^\circ\text{C/W}$

Ordering Information

AP20N15GH-HF-3TR : in RoHS-compliant, halogen-free TO-252, shipped on tape and reel (3000pcs/reel)



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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=1mA$	150	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V, I_D=10A$	-	-	100	m Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2	-	4	V
g_{fs}	Forward Transconductance	$V_{DS}=10V, I_D=10A$	-	16	-	S
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=120V, V_{GS}=0V$	-	-	25	μA
	Drain-Source Leakage Current ($T_j=125^{\circ}\text{C}$)	$V_{DS}=120V, V_{GS}=0V$	-	-	100	μA
I_{GSS}	Gate-Source Leakage	$V_{GS}= \pm 20V$	-	-	± 100	nA
Q_g	Total Gate Charge ²	$I_D=14A$	-	22	35	nC
Q_{gs}	Gate-Source Charge	$V_{DS}=120V$	-	6	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	$V_{GS}=10V$	-	7.7	-	nC
$t_{d(on)}$	Turn-on Delay Time ²	$V_{DS}=75V$	-	10	-	ns
t_r	Rise Time	$I_D=14A$	-	33	-	ns
$t_{d(off)}$	Turn-off Delay Time	$R_G=10\Omega, V_{GS}=10V$	-	27	-	ns
t_f	Fall Time	$R_D=5.35\Omega$	-	26	-	ns
C_{iss}	Input Capacitance	$V_{GS}=0V$	-	1070	1700	pF
C_{oss}	Output Capacitance	$V_{DS}=25V$	-	230	-	pF
C_{rss}	Reverse Transfer Capacitance	$f=1.0MHz$	-	9	-	pF
R_g	Gate Resistance	$f=1.0MHz$	-	1.6	2.4	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage ²	$I_S=10A, V_{GS}=0V$	-	-	1.3	V
t_{rr}	Reverse Recovery Time ²	$I_S=14A, V_{GS}=0V,$	-	0.13	-	μs
Q_{rr}	Reverse Recovery Charge	$dI/dt=100A/\mu s$	-	0.77	-	μC

Notes:

1. Pulse width limited by maximum junction temperature.
2. Pulse test - pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. Surface mounted on 1 in² copper pad of FR4 board

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

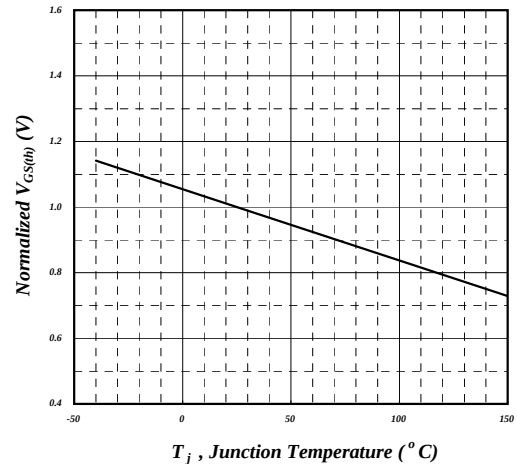
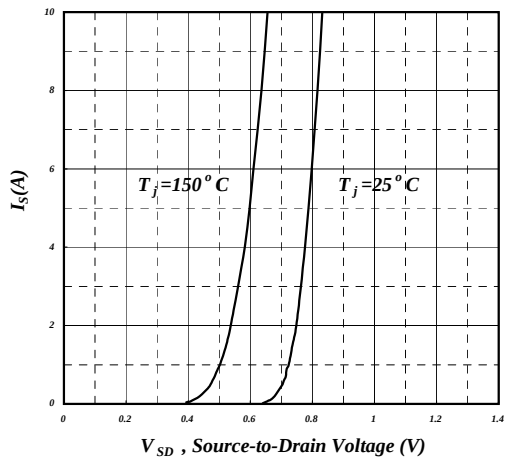
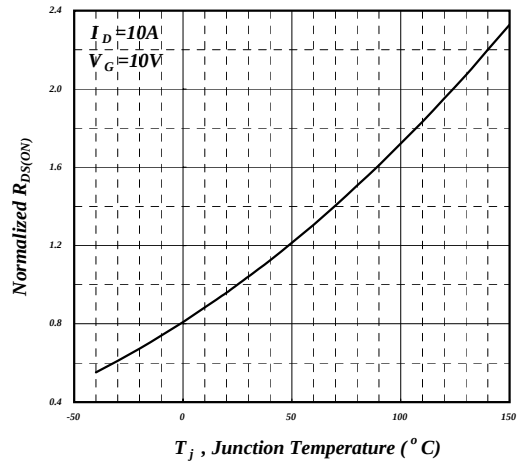
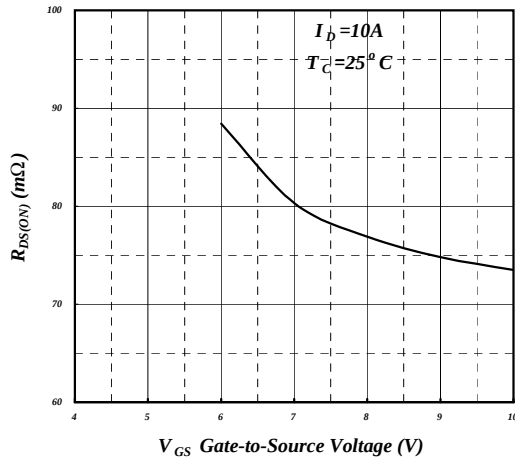
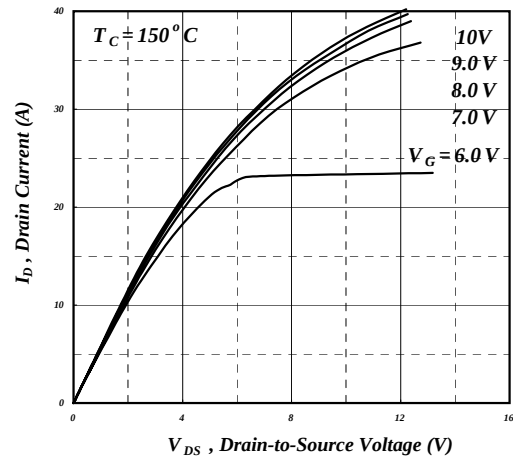
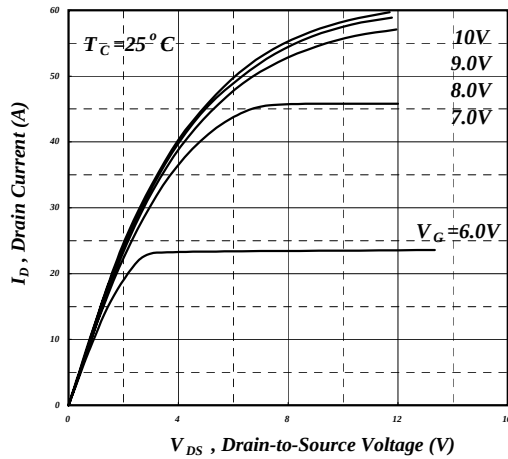
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Typical Electrical Characteristics





Typical Electrical Characteristics (cont.)

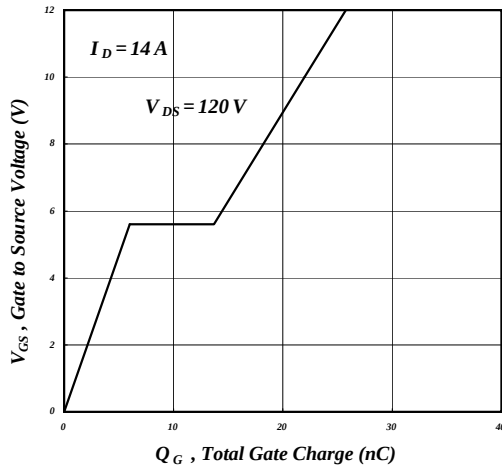


Fig 7. Gate Charge Characteristics

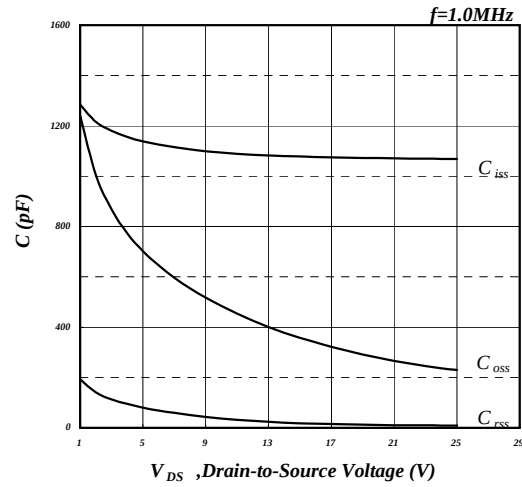


Fig 8. Typical Capacitance Characteristics

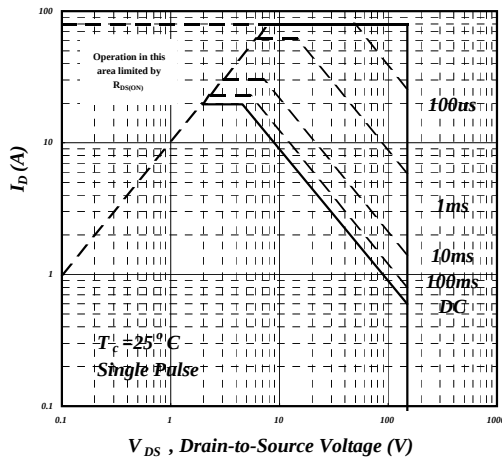


Fig 9. Maximum Safe Operating Area

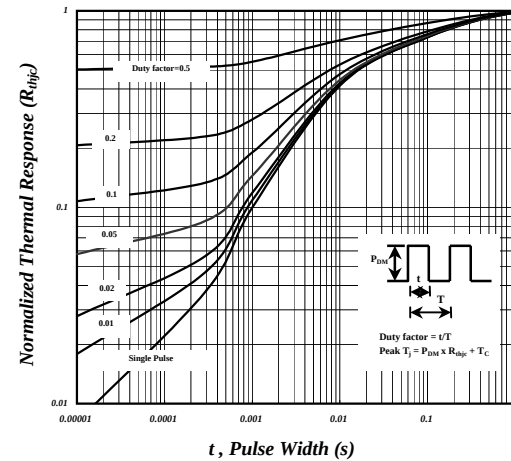


Fig 10. Effective Transient Thermal Impedance

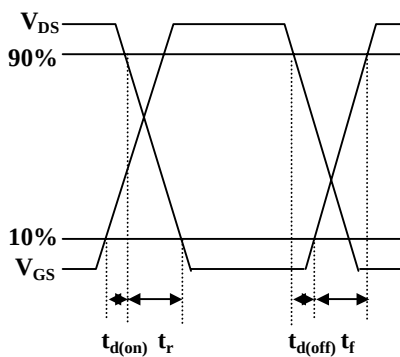


Fig 11. Switching Time Waveforms

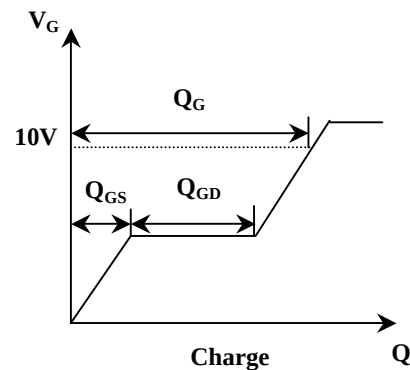
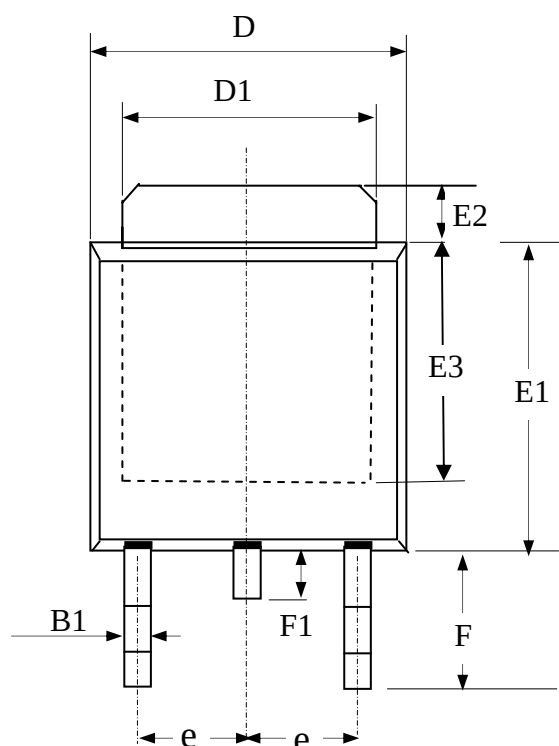


Fig 12. Gate Charge Waveform

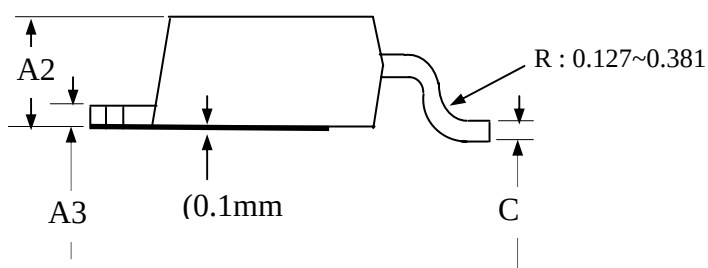


Package Dimensions: TO-252



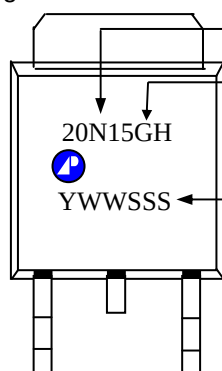
SYMBOLS	Millimeters		
	MIN	NOM	MAX
A2	1.80	2.30	2.80
A3	0.40	0.50	0.60
B1	0.40	0.70	1.00
D	6.00	6.50	7.00
D1	4.80	5.35	5.90
E3	3.50	4.00	4.50
F	2.20	2.63	3.05
F1	0.50	0.85	1.20
E1	5.10	5.70	6.30
E2	0.50	1.10	1.80
e	--	2.30	--
C	0.35	0.50	0.65

1. All dimensions are in millimeters.
2. Dimensions do not include mold protrusions.



Marking Information:

Laser Marking



Product: AP20N15

Package code

GH = RoHS-compliant halogen-free TO-252

Date/lot code (YWWSSS)

Y: Last digit of the year

WW: Work week

SSS: Lot code sequence