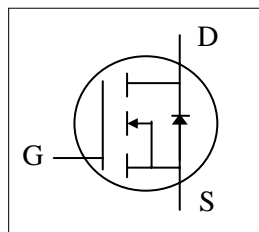


AP15N03H/J**Advanced Power
Electronics Corp.***N-CHANNEL ENHANCEMENT MODE**POWER MOSFET*

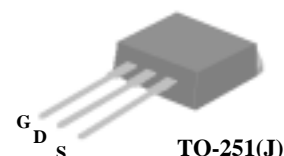
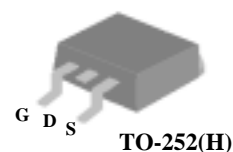
- ▼ Low Gate Charge
- ▼ Simple Drive Requirement
- ▼ Fast Switching



BV_{DSS}	30V
$R_{DS(ON)}$	80m Ω
I_D	15A

Description

The TO-252 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters. The through-hole version (AP15N03J) is available for low-profile applications.

**Absolute Maximum Ratings**

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V	15	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V	9	A
I_{DM}	Pulsed Drain Current ¹	50	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation	28	W
	Linear Derating Factor	0.22	W/ $^\circ\text{C}$
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-case	Thermal Resistance Junction-case	Max. 4.8	$^\circ\text{C}/\text{W}$
Rthj-amb	Thermal Resistance Junction-ambient	Max. 110	$^\circ\text{C}/\text{W}$



AP15N03H/J

Electrical Characteristics @T_j=25°C (unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	30	-	-	V
ΔBV _{DSS} /ΔT _j	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I _D =1mA	-	0.037	-	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =8A	-	-	80	mΩ
		V _{GS} =4.5V, I _D =6A	-	-	100	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	1	-	3	V
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =18A	-	16	-	S
I _{DSS}	Drain-Source Leakage Current (T _j =25°C)	V _{DS} =30V, V _{GS} =0V	-	-	1	uA
	Drain-Source Leakage Current (T _j =150°C)	V _{DS} =24V, V _{GS} =0V	-	-	25	uA
I _{GSS}	Gate-Source Leakage	V _{GS} = ± 20V	-	-	±100	nA
Q _g	Total Gate Charge ²	I _D =8A	-	4.6	-	nC
Q _{gs}	Gate-Source Charge	V _{DS} =24V	-	1.1	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =5V	-	3	-	nC
t _{d(on)}	Turn-on Delay Time ²	V _{DS} =15V	-	4.9	-	ns
t _r	Rise Time	I _D =8A	-	22.5	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =3.4Ω, V _{GS} =10V	-	12.2	-	ns
t _f	Fall Time	R _D =1.9Ω	-	3.3	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	160	-	pF
C _{oss}	Output Capacitance	V _{DS} =25V	-	107	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	32	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
I _S	Continuous Source Current (Body Diode)	V _D =V _G =0V , V _S =1.3V	-	-	15	A
I _{SM}	Pulsed Source Current (Body Diode) ¹		-	-	50	A
V _{SD}	Forward On Voltage ²	T _j =25°C, I _S =15A, V _{GS} =0V	-	-	1.3	V

Notes:

1. Pulse width limited by safe operating area.
2. Pulse width ≤300us , duty cycle ≤2%.

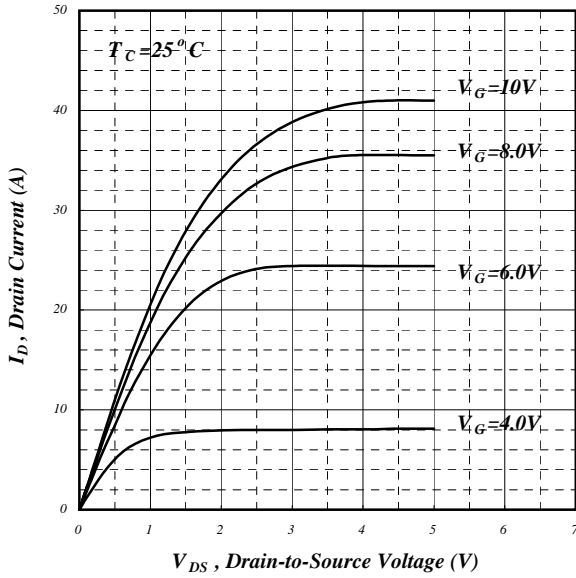


Fig 1. Typical Output Characteristics

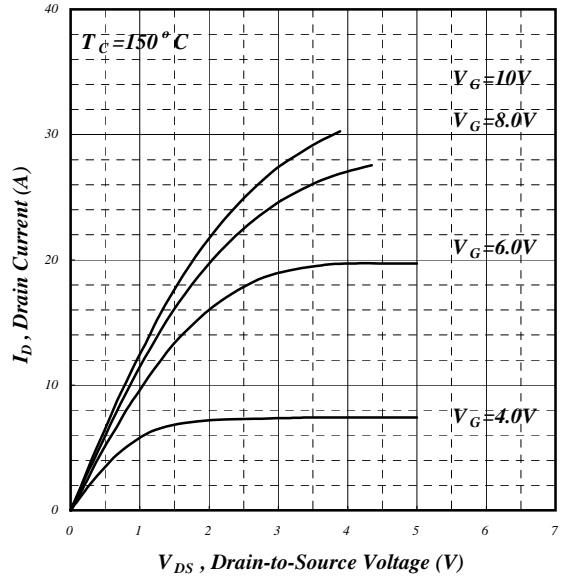


Fig 2. Typical Output Characteristics

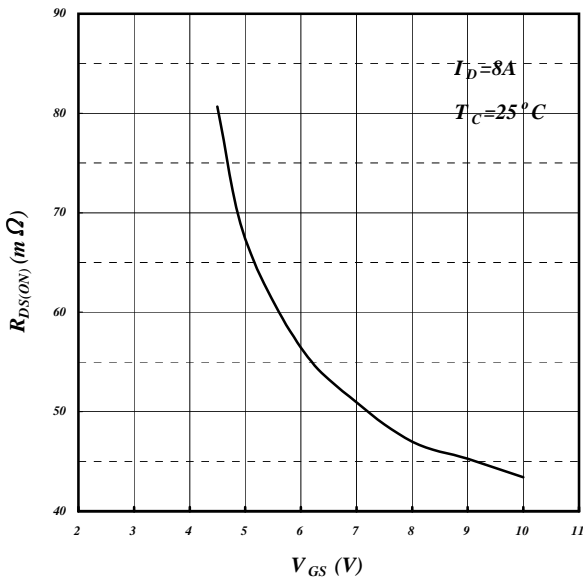


Fig 3. On-Resistance v.s. Gate Voltage

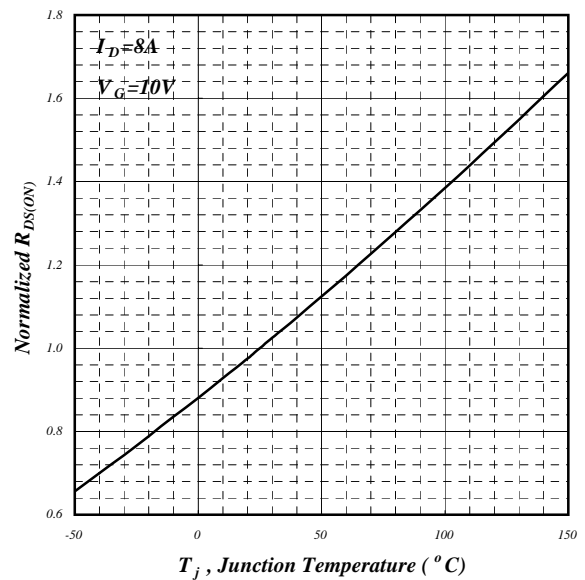


Fig 4. Normalized On-Resistance v.s. Junction Temperature



AP15N03H/J

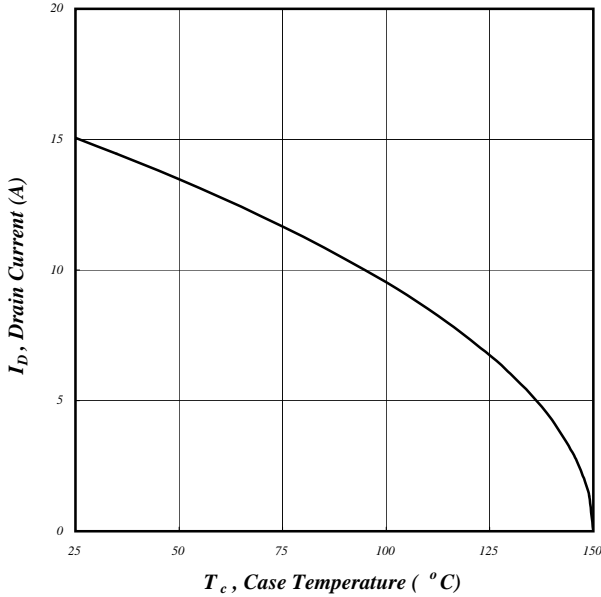


Fig 5. Maximum Drain Current v.s. Case Temperature

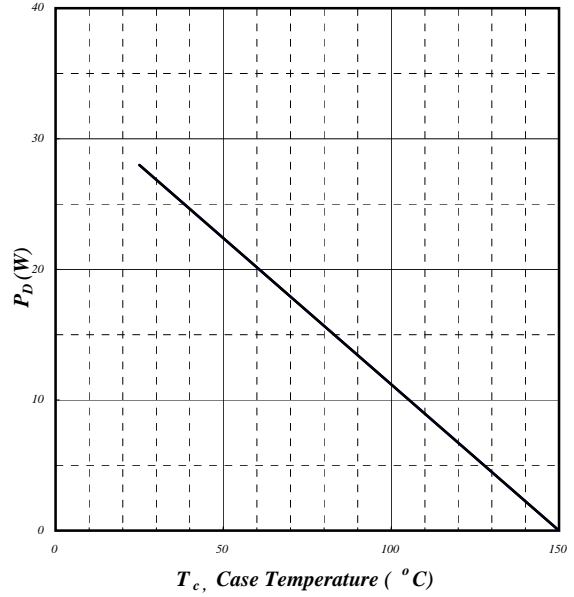


Fig 6. Typical Power Dissipation

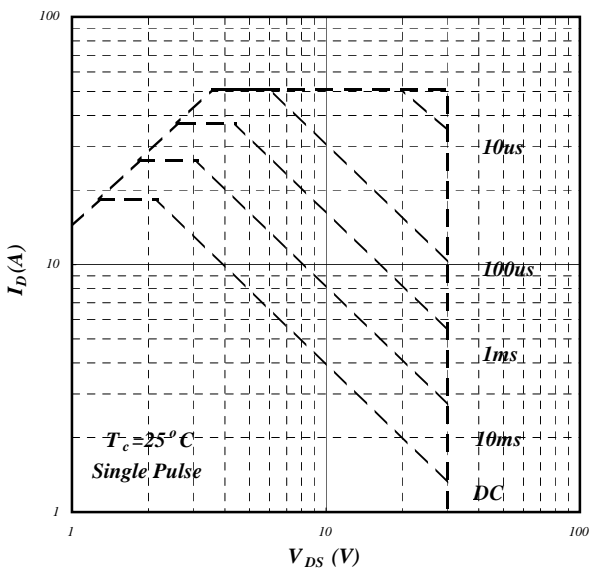


Fig 7. Maximum Safe Operating Area

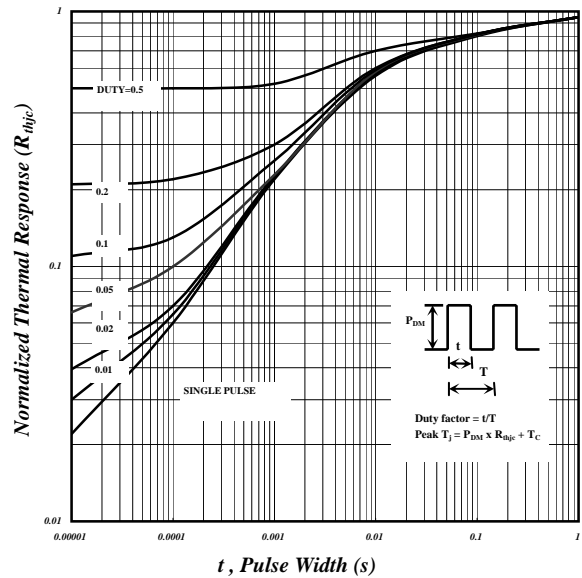


Fig 8. Effective Transient Thermal Impedance



AP15N03H/J

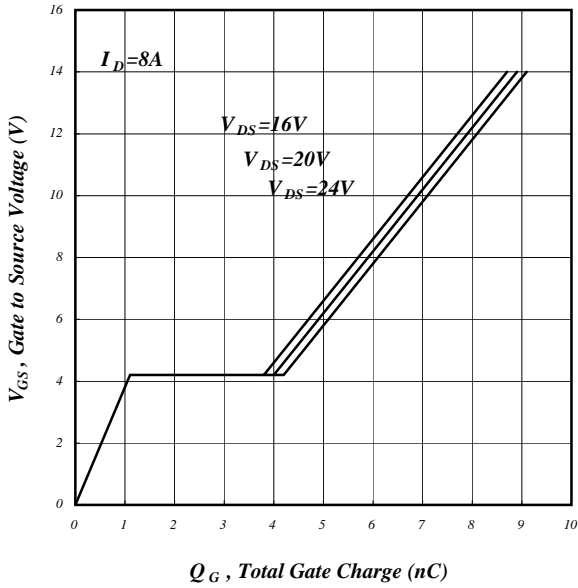


Fig 9. Gate Charge Characteristics

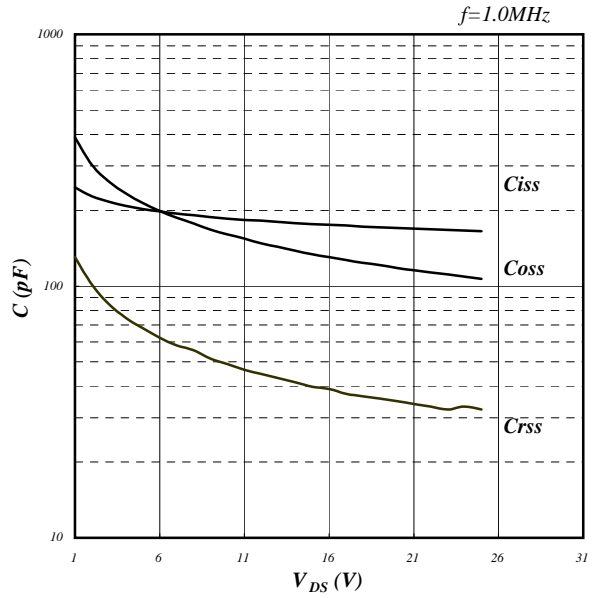


Fig 10. Typical Capacitance Characteristics

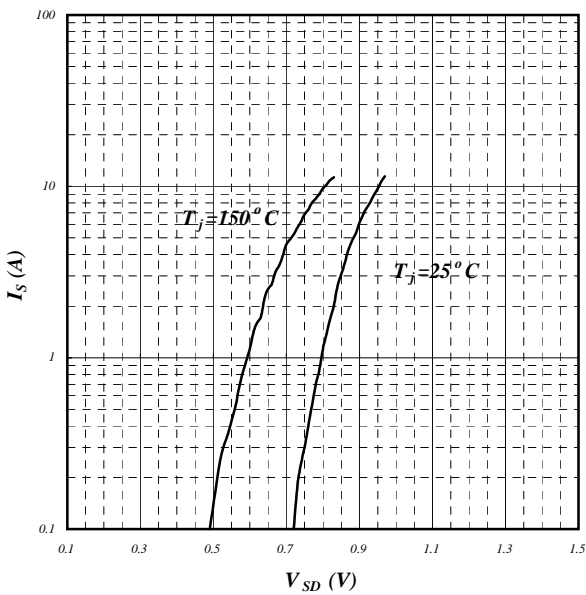


Fig 11. Forward Characteristic of Reverse Diode

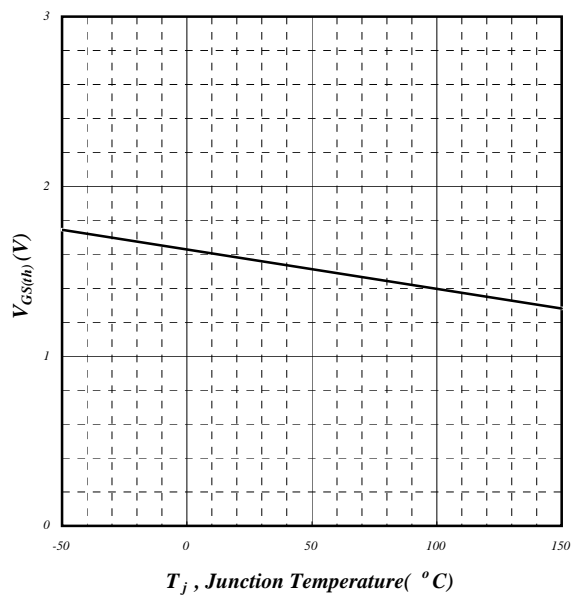


Fig 12. Gate Threshold Voltage v.s. Junction Temperature



AP15N03H/J

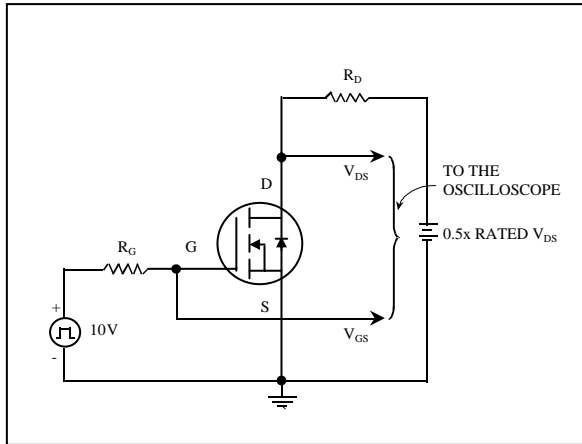


Fig 13. Switching Time Circuit

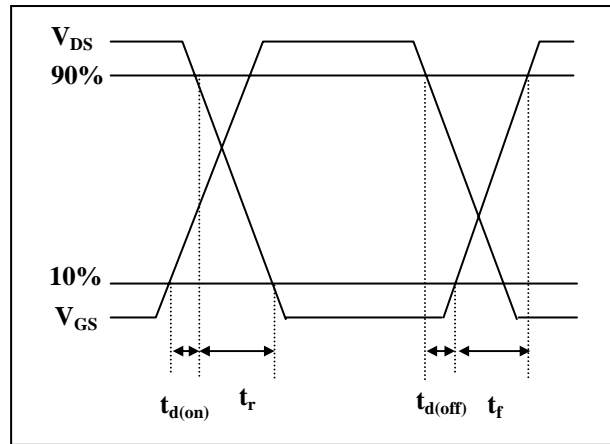


Fig 14. Switching Time Waveform

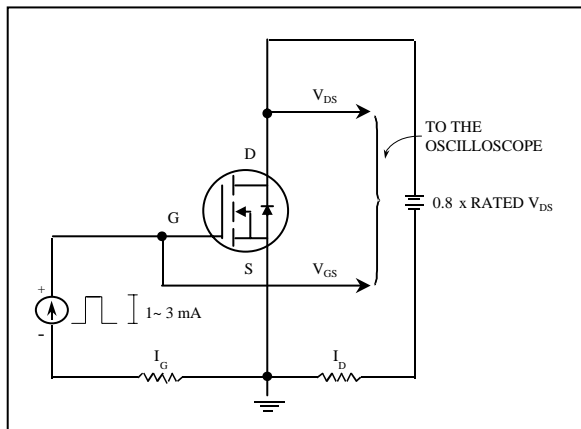


Fig 15. Gate Charge Circuit

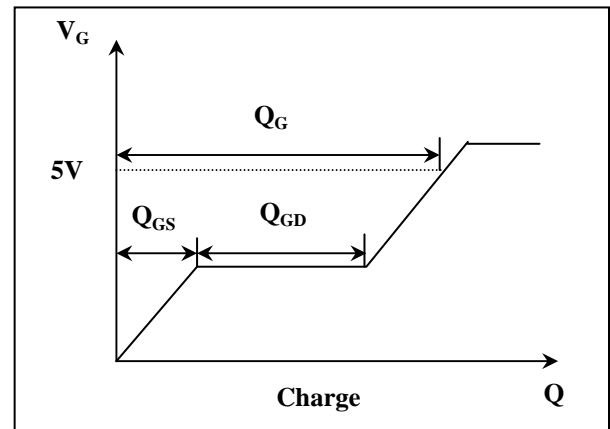


Fig 16. Gate Charge Waveform