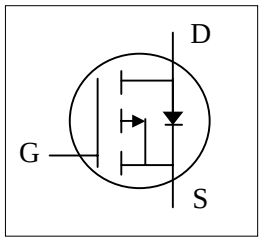
AP6P025S

Halogen-Free Product

Advanced Power Electronics Corp.

P-CHANNEL ENHANCEMENT MODE POWER MOSFET

- ▼ **100% R_g & UIS Test**
- ▼ **Simple Drive Requirement**
- ▼ **Fast Switching Characteristic**
- ▼ **RoHS Compliant & Halogen-Free**

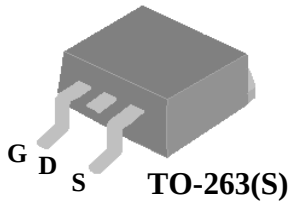


BV_{DSS}	-60V
$R_{DS(ON)}$	25mΩ
I_D	-40A

Description

AP6P025 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-263 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.



Absolute Maximum Ratings@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Drain Current, V_{GS} @ 10V	-40	A
I_D@T_C=100℃	Drain Current, V_{GS} @ 10V	-25	A
I_{DM}	Pulsed Drain Current[1]	-160	A
P_D@T_C=25℃	Total Power Dissipation	62.5	W
P_D@T_A=25℃	Total Power Dissipation	3.12	W
E_{AS}	Single Pulse Avalanche Energy[4]	28.8	mJ
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Maximum Thermal Resistance, Junction-case	2	℃/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient (PCB mount)[3]	40	℃/W

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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	-60	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=-10V, I_D=-20A	-	-	25	mΩ
		V_{GS}=-4.5V, I_D=-15A	-	-	30	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=-20A	-	47	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-48V, V_{GS}=0V	-	-	-25	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Q_g	Total Gate Charge	I_D=-15A	-	37	59.2	nC
Q_{gs}	Gate-Source Charge	V_{DS}=-48V	-	12	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=-4.5V	-	15	-	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=-30V	-	11	-	ns
t_r	Rise Time	I_D=-20A	-	40	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω	-	84	-	ns
t_f	Fall Time	V_{GS}=-10V	-	79	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	4000	6400	pF
C_{oss}	Output Capacitance	V_{DS}=-25V	-	240	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	170	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage[2]	I_S=-20A, V_{GS}=0V	-	-	-1.3	V
t_{rr}	Reverse Recovery Time	I_S=-20A, V_{GS}=0V,	-	23	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=-100A/μs	-	17	-	nC

Notes:

1.Pulse width limited by Max. junction temperature.

2.Pulse test

3.Surface mounted on 1 in^2 copper pad of FR4 board

4.Starting T_j=25°C , V_{DD}=-30V , L=0.1mH , R_G=25Ω

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.

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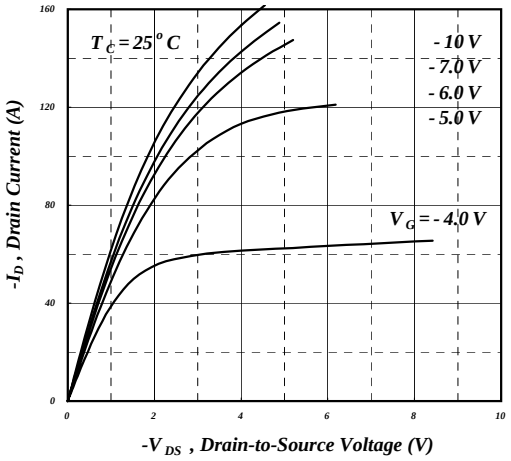


Fig 1. Typical Output Characteristics

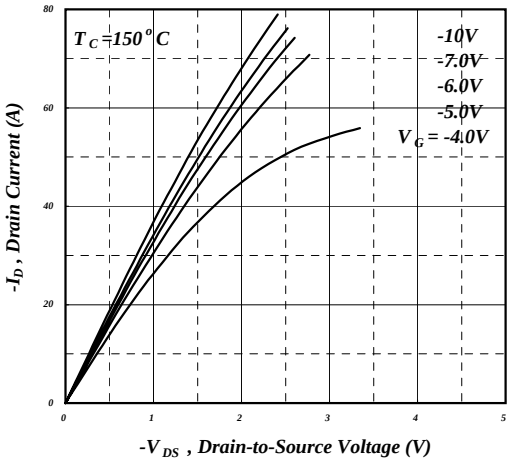


Fig 2. Typical Output Characteristics

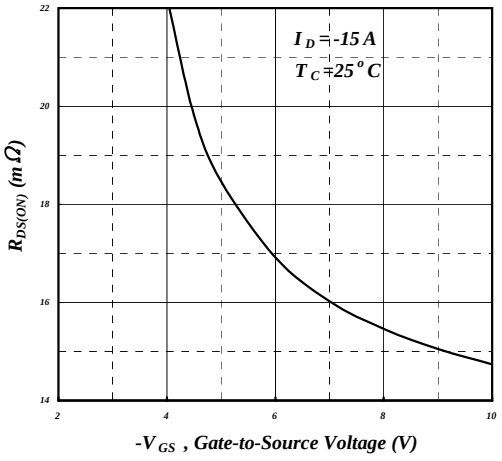


Fig 3. On-Resistance v.s. Gate Voltage

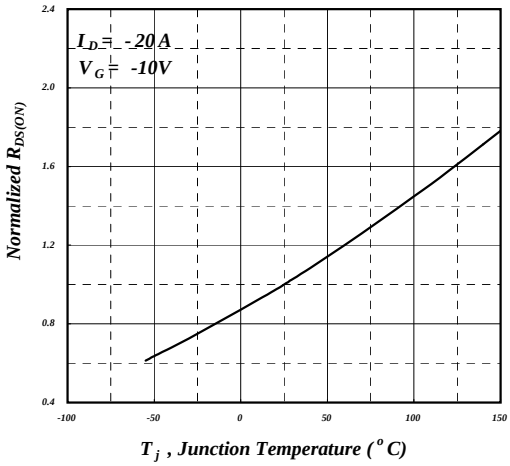


Fig 4. Normalized On-Resistance v.s. Junction Temperature

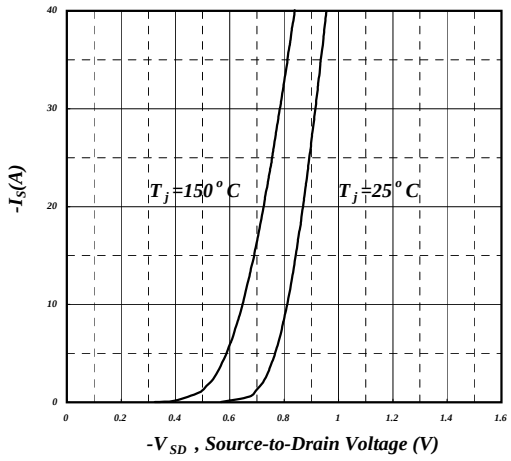


Fig 5. Forward Characteristic of Reverse Diode

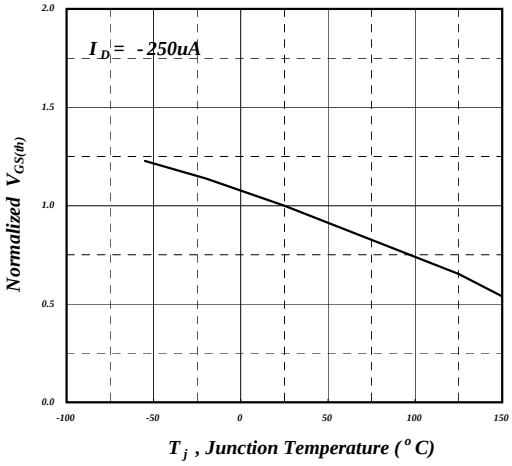


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

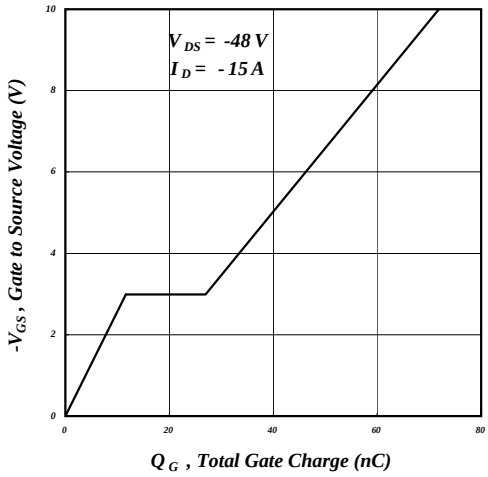


Fig 7. Gate Charge Characteristics

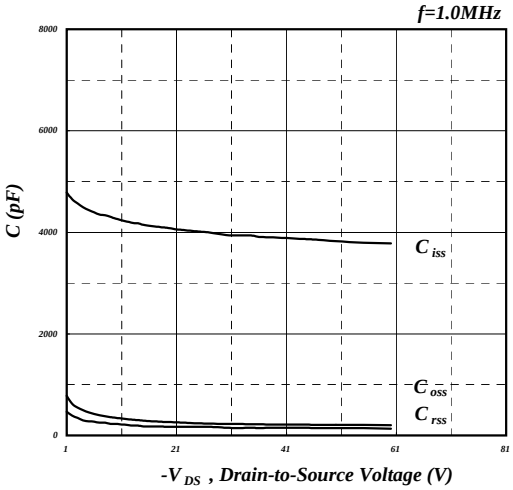


Fig 8. Typical Capacitance Characteristics

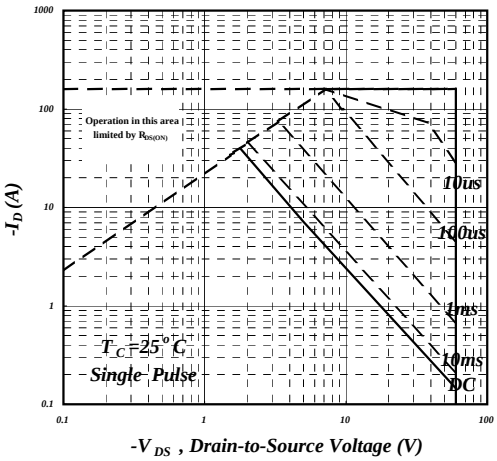


Fig 9. Maximum Safe Operating Area

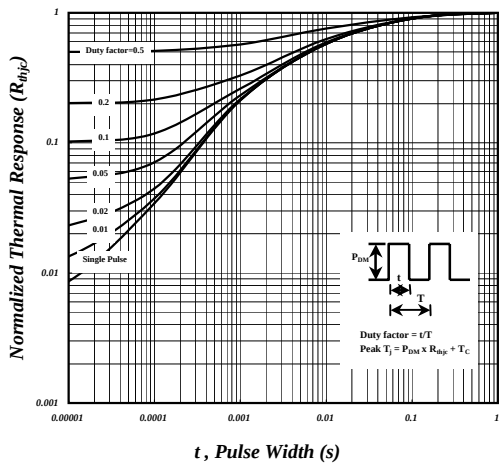


Fig 10. Effective Transient Thermal Impedance

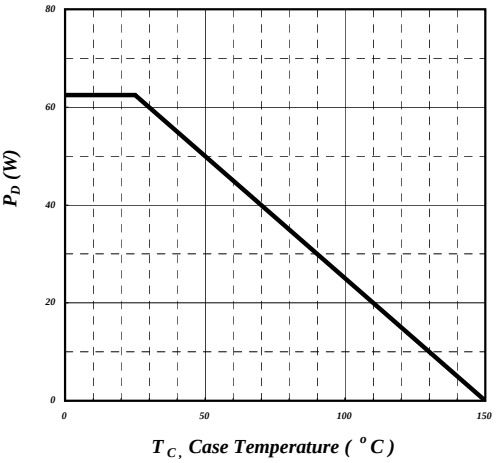


Fig 11. Typical Power Dissipation

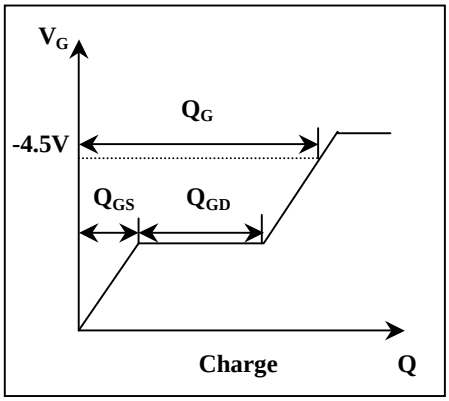


Fig 12. Gate Charge Waveform

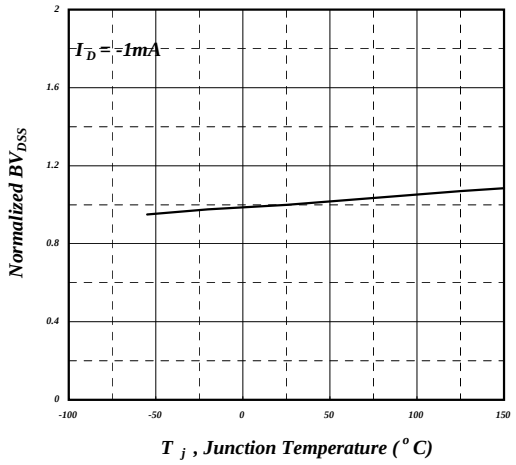


Fig 13. Normalized BV_{DSS} v.s. Junction Temperature

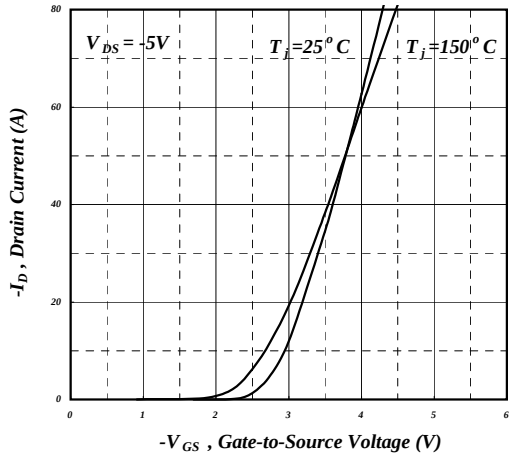


Fig 14. Transfer Characteristics

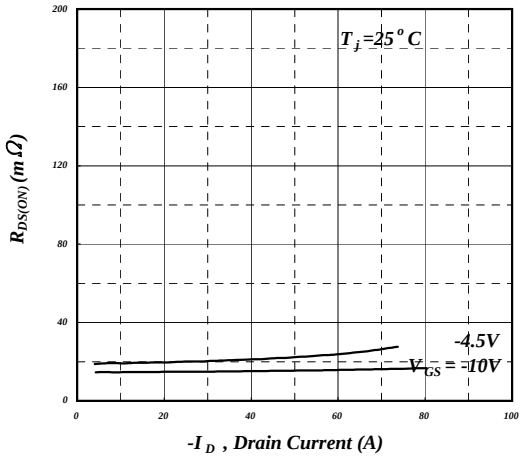
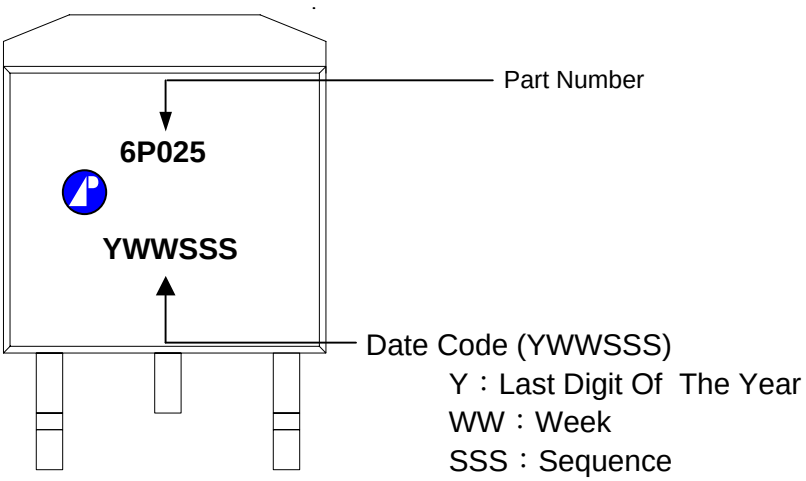


Fig 15. Typ. Drain-Source on State Resistance

MARKING INFORMATION