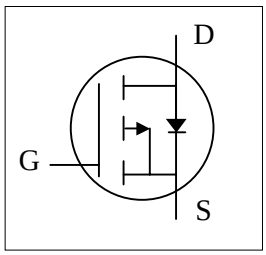
AP40P03GP

RoHS-compliant Product

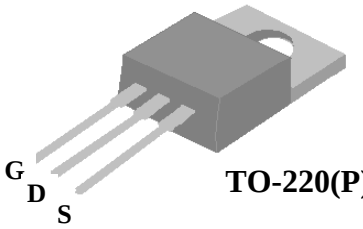
Advanced Power Electronics Corp.

P-CHANNEL ENHANCEMENT MODE POWER MOSFET

- ▼ **Lower Gate Charge**
- ▼ **Simple Drive Requirement**
- ▼ **Fast Switching Characteristic**



BV_{DSS}	-30V
$R_{DS(ON)}$	28mΩ
I_D	-30A



TO-220(P)

Description

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

The TO-220 package is universally preferred for all commercial-industrial through hole applications and suited for low voltage 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℃	Continuous Drain Current, V_{GS} @ 10V	-30	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V	-18	A
I_{DM}	Pulsed Drain Current[1]	-120	A
P_D@T_C=25℃	Total Power Dissipation	31.3	W
	Linear Derating Factor	0.25	W/℃
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	Thermal Resistance Junction-case	Max.	4	℃/W
Rthj-a	Thermal Resistance Junction-ambient	Max.	62	℃/W

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
$\Delta BV_{DSS}/\Delta T_j$	Breakdown Voltage Temperature Coefficient	Reference to 25℃, I_D=-1mA	-	-0.02	-	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=-10V, I_D=-18A	-	-	28	mΩ
		V_{GS}=-4.5V, I_D=-10A	-	-	50	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	-	20	-	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=-18A	-	14	22	nC
Q_{gs}	Gate-Source Charge	V_{DS}=-24V	-	3	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=-4.5V	-	9	-	nC
$t_{d(on)}$	Turn-on Delay Time[2]	V_{DS}=-15V	-	12	-	ns
t_r	Rise Time	I_D=-18A	-	56	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω,V_{GS}=-10V	-	30	-	ns
t_f	Fall Time	R_D=0.8Ω	-	57	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	915	1465	pF
C_{oss}	Output Capacitance	V_{DS}=-25V	-	280	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	195	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage[2]	I_S=-18A, V_{GS}=0V	-	-	-1.2	V
t_{rr}	Reverse Recovery Time[2]	I_S=-18A, V_{GS}=0V,	-	30	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=-100A/μs	-	21	-	nC

Notes:

1.Pulse width limited by Max. junction temperature.

2.Pulse test

THIS PRODUCT IS AN ELECTROSTATIC SENSITIVE, PLEASE HANDLE WITH CAUTION.

THIS PRODUCT HAS BEEN QUALIFIED FOR CONSUMER MARKET. APPLICATIONS OR USES AS CRITERIAL COMPONENT IN LIFE SUPPORT DEVICE OR SYSTEM ARE NOT AUTHORIZED.

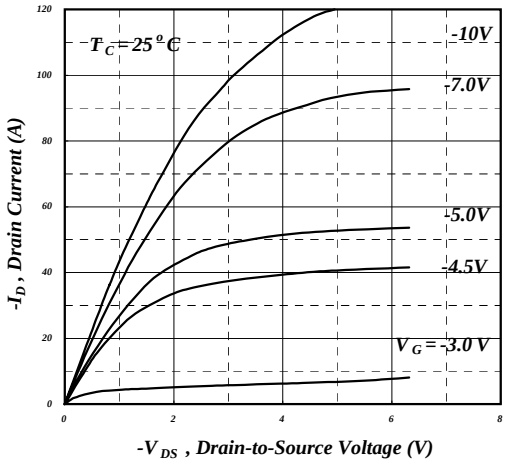


Fig 1. Typical Output Characteristics

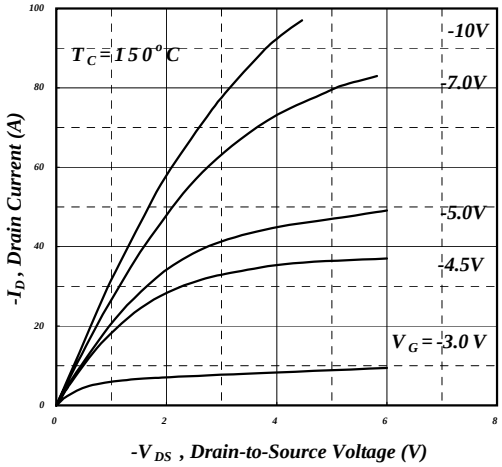


Fig 2. Typical Output Characteristics

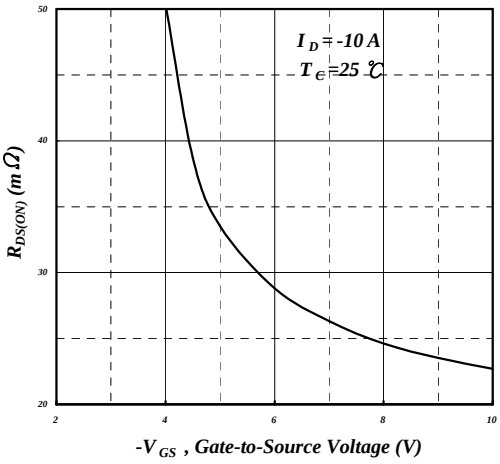


Fig 3. On-Resistance v.s. Gate Voltage

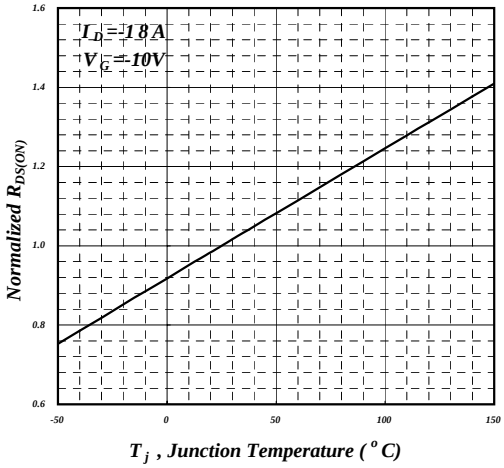


Fig 4. Normalized On-Resistance v.s. Junction Temperature

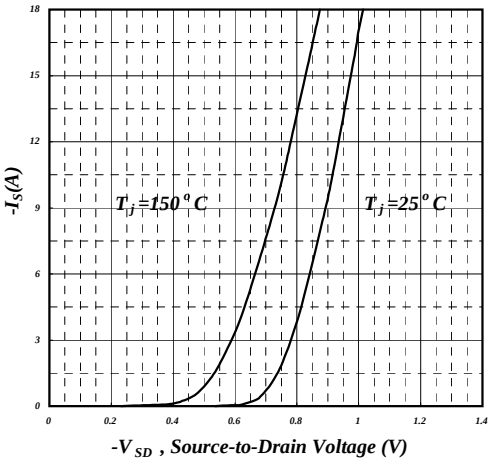


Fig 5. Forward Characteristic of Reverse Diode

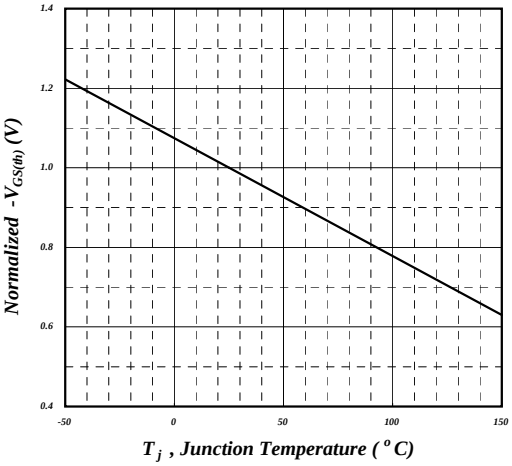


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

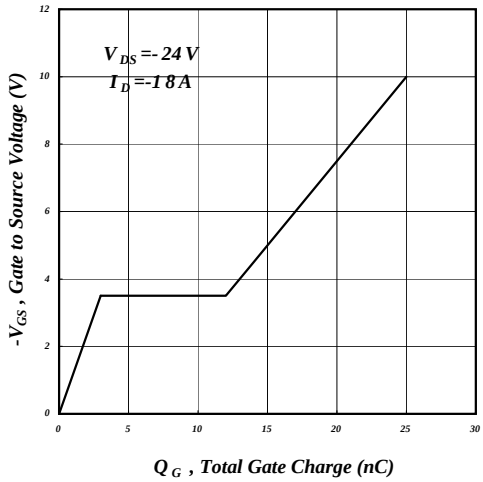


Fig 7. Gate Charge Characteristics

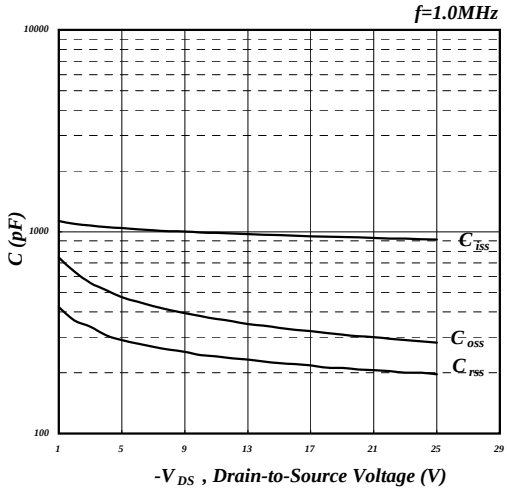


Fig 8. Typical Capacitance Characteristics

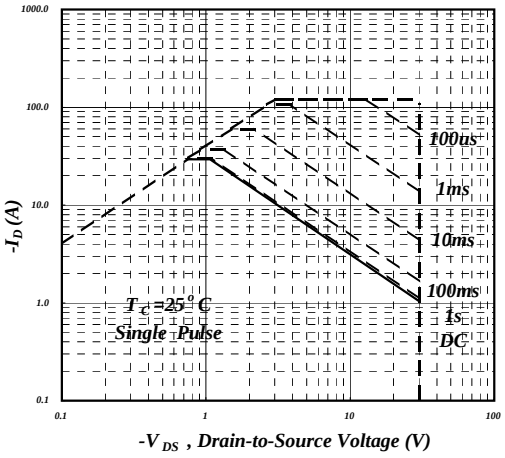


Fig 9. Maximum Safe Operating Area

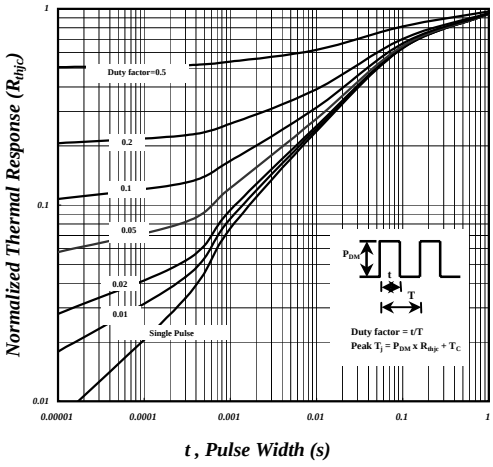


Fig 10. Effective Transient Thermal Impedance

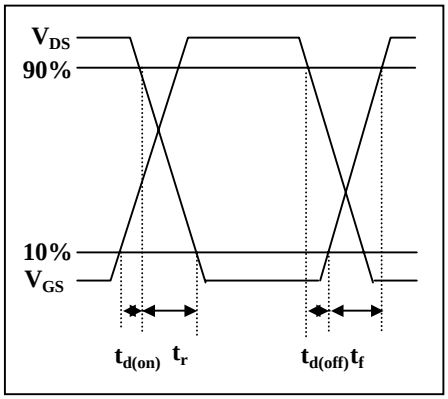


Fig 11. Switching Time Waveform

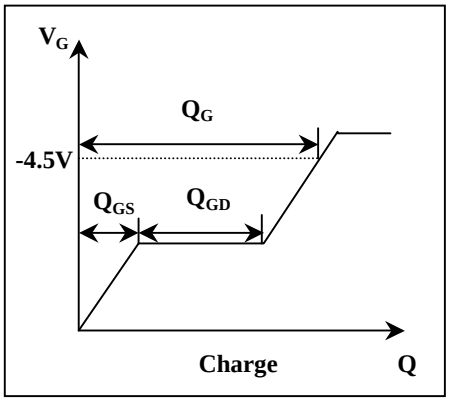
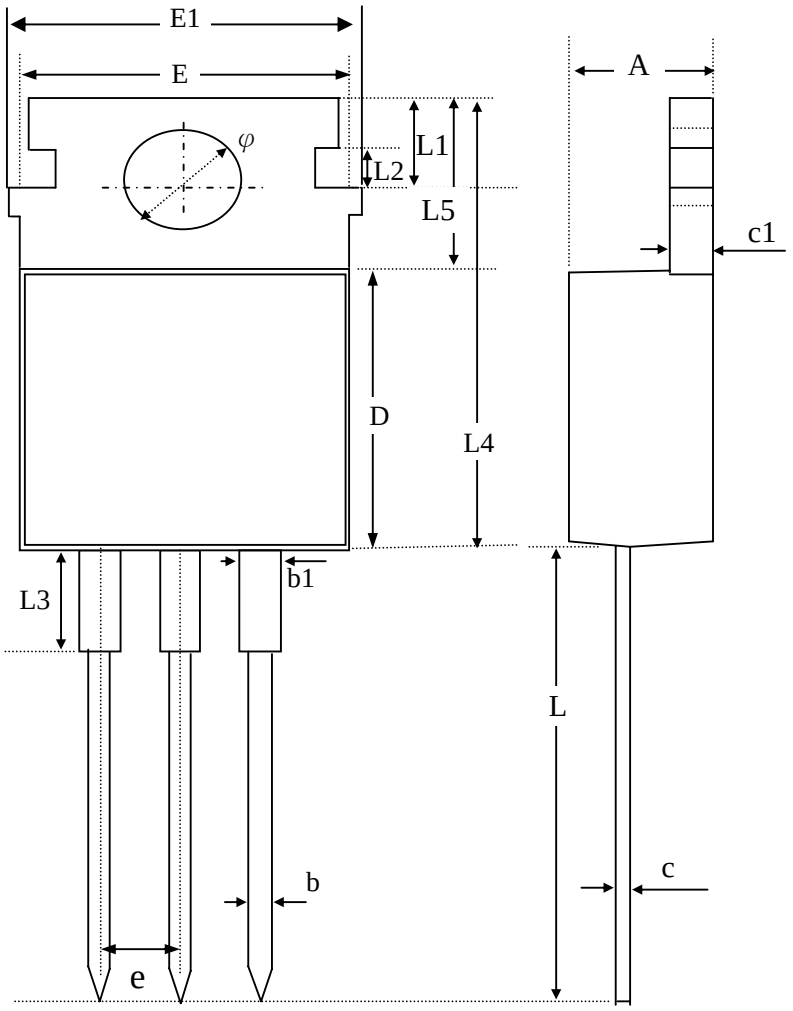


Fig 12. Gate Charge Waveform

Package Outline : TO-220



SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	4.25	4.48	4.70
b	0.65	0.80	0.90
b1	1.15	1.38	1.60
c	0.40	0.50	0.60
c1	1.00	1.20	1.40
E	9.70	10.00	10.40
E1	---	---	11.50
e	----	2.54	----
L	12.70	13.60	14.50
L1	2.60	2.80	3.00
L2	1.00	1.40	1.80
L3	2.6	3.10	3.6
L4	14.70	15.50	16
L5	6.30	6.50	6.70
φ	3.50	3.60	3.70
D	8.40	8.90	9.40

1.All Dimensions Are in Millimeters.

2.Dimension Does Not Include Mold Protrusions.

Part Marking Information & Packing : TO-220

