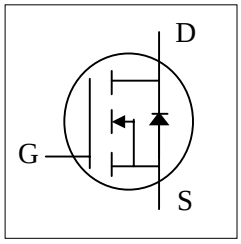
AP3R303GMT-L

Halogen-Free Product

Advanced Power Electronics Corp.

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

- ▼ **Simple Drive Requirement**
- ▼ **SO-8 Compatible with Heatsink**
- ▼ **Low On-resistance**
- ▼ **RoHS Compliant & Halogen-Free**

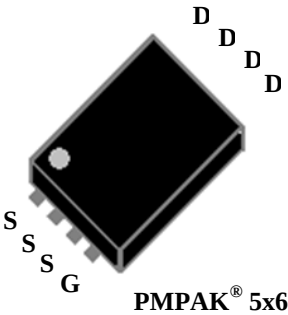


BV_{DSS}	30V
$R_{DS(ON)}$	3.3mΩ
I_D[5]	105A

Description

AP3R303 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 PMPAK® 5x6L ppackage is special for voltage conversion application using standard infrared reflow technique with the backside heat sink to achieve the good thermal performance.



PMPAK® 5x6L

Absolute Maximum Ratings@T_j=25°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℃	Drain Current (Chip), V_{GS} @ 10V[5]	105	A
I_D@T_A=25℃	Drain Current[3], V_{GS} @ 10V	31	A
I_D@T_A=70℃	Drain Current[3], V_{GS} @ 10V	25	A
I_{DM}	Pulsed Drain Current[1]	250	A
P_D@T_C=25℃	Total Power Dissipation	56.8	W
P_D@T_A=25℃	Total Power Dissipation	5	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	2.2	℃/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient[3]	25	℃/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
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V, I_D=30A	-	-	3.3	mΩ
		V_{GS}=4.5V, I_D=20A	-	-	4.5	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	-	60	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=24V, V_{GS}=0V	-	-	10	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Q_g	Total Gate Charge	I_D=30A	-	13.3	21	nC
Q_{gs}	Gate-Source Charge	V_{DS}=15V	-	2.5		nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=4.5V	-	7.2		nC
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=15V	-	8	-	ns
t_r	Rise Time	I_D=1A	-	5.5	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω	-	25	-	ns
t_f	Fall Time	V_{GS}=10V	-	17	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	1400	2240	pF
C_{oss}	Output Capacitance	V_{DS}=25V	-	440	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	170	-	pF
R_g	Gate Resistance	f=1.0MHz	-	1.4	2.8	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage[2]	I_S=30A, V_{GS}=0V	-	-	1.2	V
t_{rr}	Reverse Recovery Time	I_S=10A, V_{GS}=0V,	-	35	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	32	-	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, t ≤10sec; 60°C/W at steady state.

4.Starting T_j=25°C , V_{DD}=25V , L=0.1mH , R_G=25Ω , I_{AS}=24A.

5.Package limitation current is 60A .

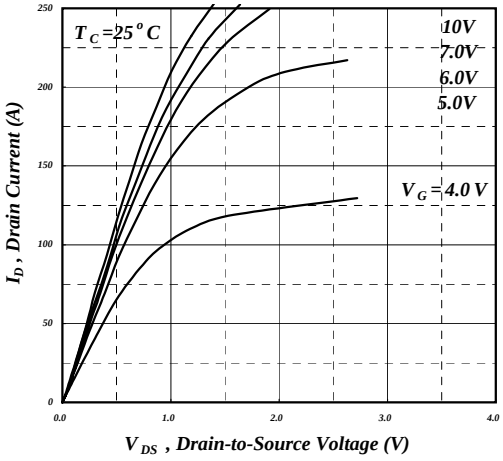


Fig 1. Typical Output Characteristics

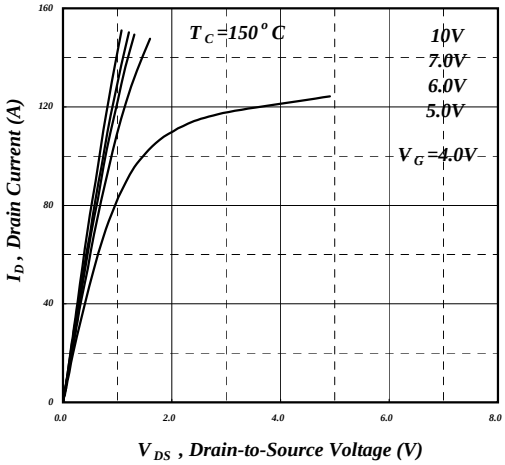


Fig 2. Typical Output Characteristics

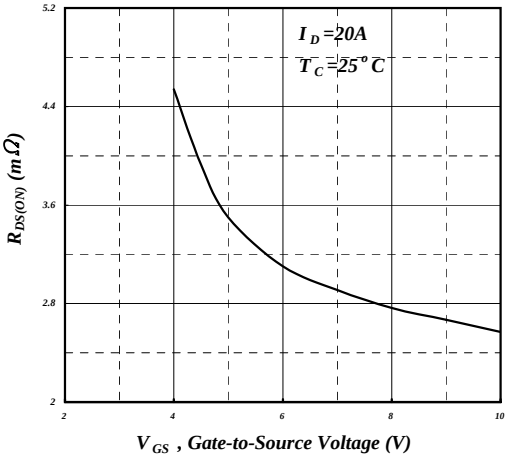


Fig 3. On-Resistance v.s. Gate Voltage

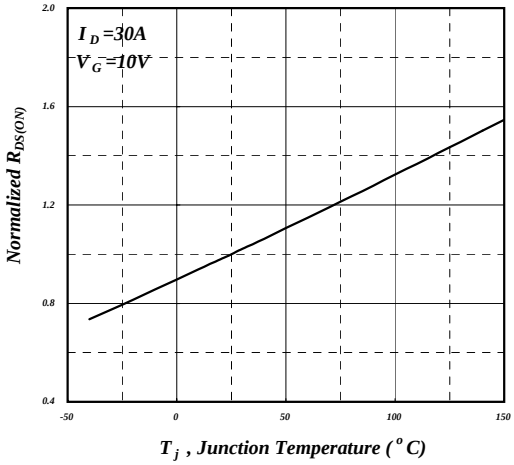


Fig 4. Normalized On-Resistance v.s. Junction Temperature

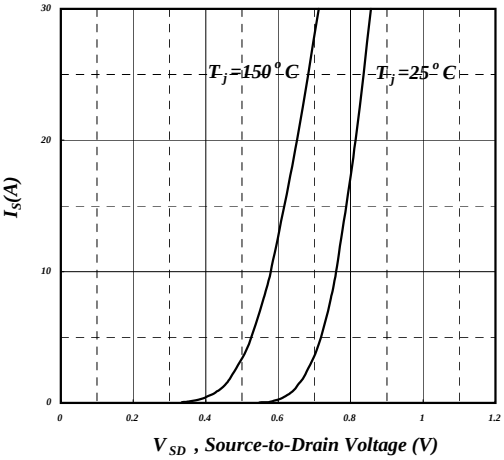


Fig 5. Forward Characteristic of Reverse Diode

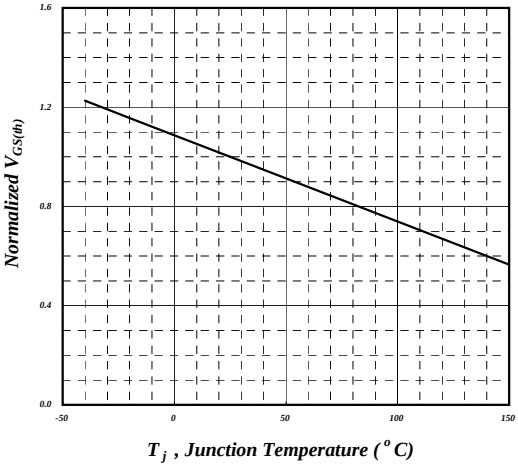


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

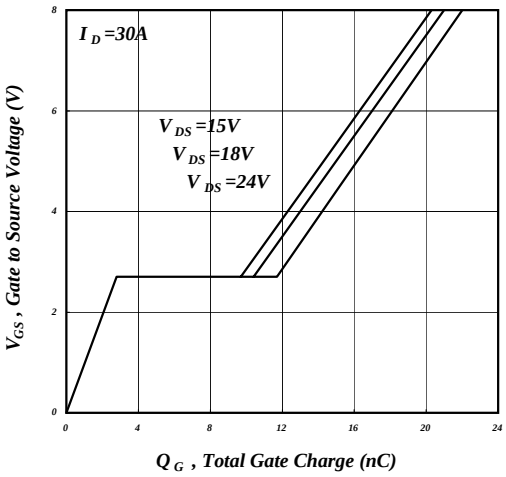


Fig 7. Gate Charge Characteristics

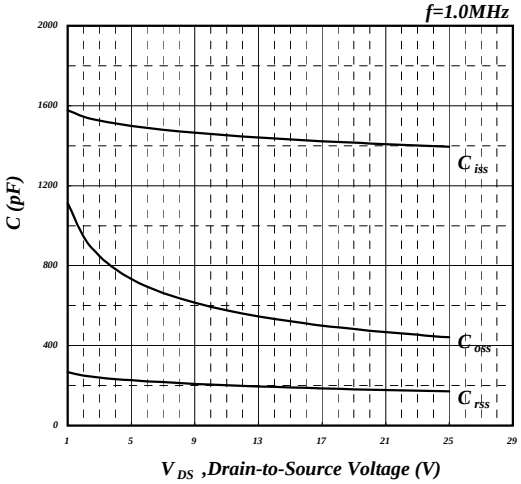


Fig 8. Typical Capacitance Characteristics

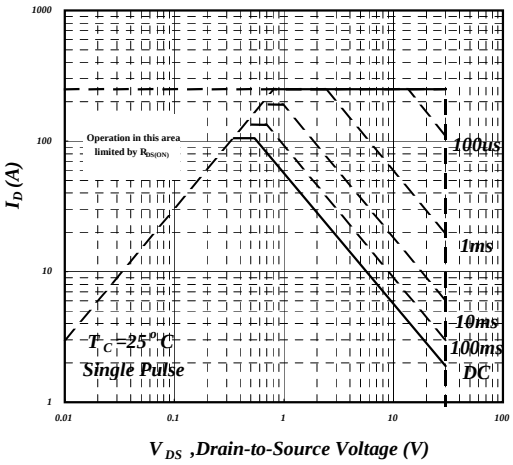


Fig 9. Maximum Safe Operating Area

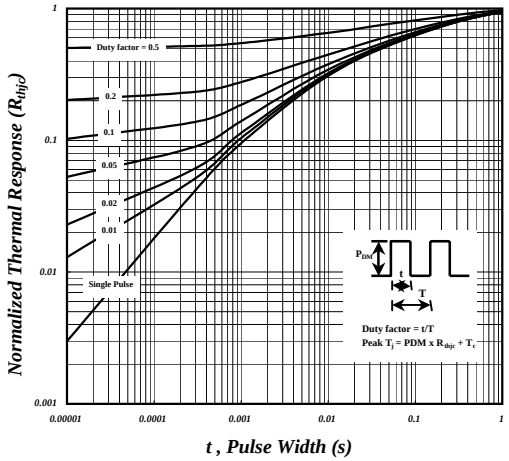


Fig 10. Effective Transient Thermal Impedance

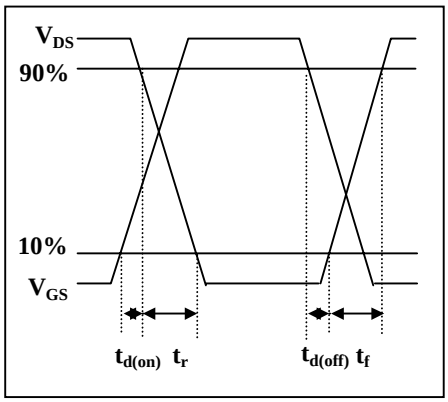


Fig 11. Switching Time Waveform

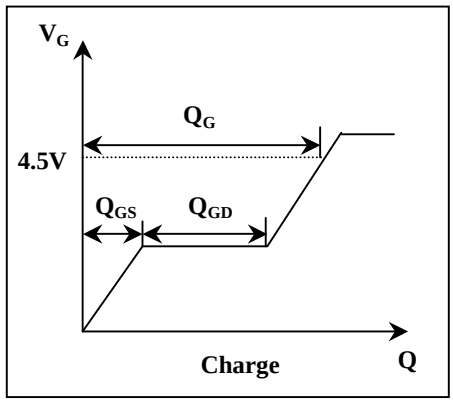
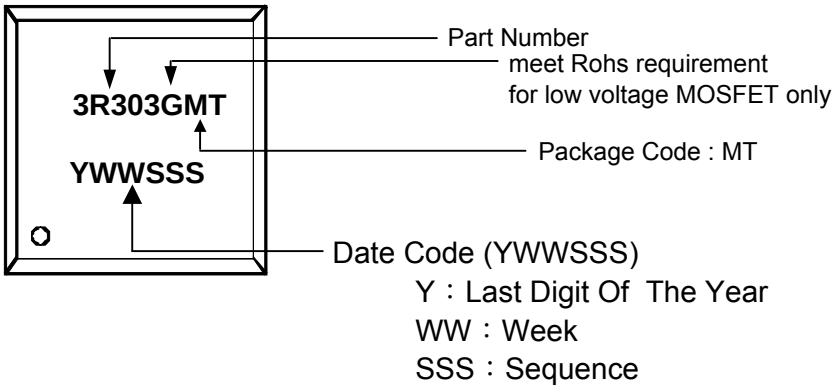
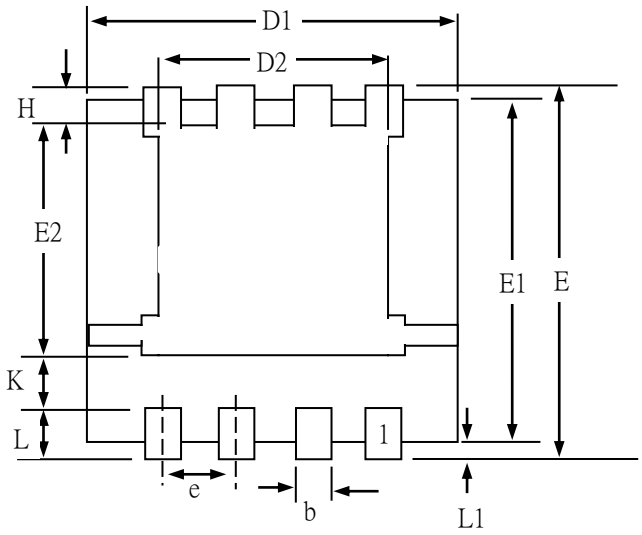


Fig 12. Gate Charge Waveform

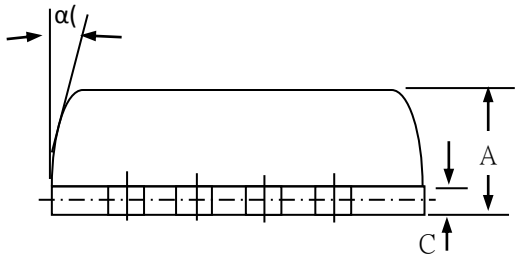
MARKING INFORMATION



Package Outline : PMPAK 5x6L



BACKSIDE VIEW



SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	0.90	1.10	1.30
b	0.33	0.41	0.51
C	0.15	—	—
D1	4.80	4.90	5.10
D2	—	—	4.40
E	6.25	6.35	6.45
E1 (Ref.)	5.60	5.75	5.90
E2 (Ref.)	3.30	3.55	3.80
e	1.27 BSC		
H	—	—	0.90
K (Ref.)	0.70	—	—
L	0.68	0.78	0.88
L1	0.25	0.30	0.40
α(Ref.)	0°	—	12°

1.All Dimension Are In Millimeters.

2.Dimension Does Not Include Mold Protrusions.

Draw No. M1-MT8L-4-Gv01

LAYOUT GUIDE