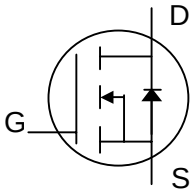
N-channel Enhancement-mode Power MOSFET

Simple Drive Requirement

Industry Standard Compatible "5x6" Package with Heatsink

Very Low On-resistance

RoHS-compliant, halogen-free

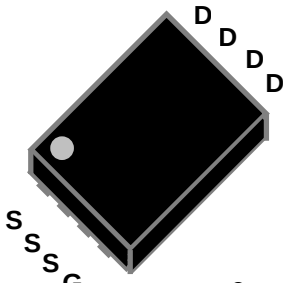


BV_{DSS}	30V
$R_{DS(ON)}$	0.99mΩ
I_D	260A

Description

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 PMPAK®5x6 package is specially designed for DC-DC converter applications, with a foot print that is compatible with other popular "5x6" packages and offers a backside heat sink and low package profile.



PMPAK®5x6

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D at T_C=25°C	Continuous Drain Current (Chip) [4]	260	A
I_D at T_A=25°C	Continuous Drain Current[3]	57	A
I_D at T_A=70°C	Continuous Drain Current[3]	46	A
I_{DM}	Pulsed Drain Current[1]	300	A
P_D at T_C=25°C	Total Power Dissipation	104	W
P_D at T_A=25°C	Total Power Dissipation	5	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Maximum Thermal Resistance, Junction-case	1.2	°C/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient[3]	25	°C/W

Ordering Information

AP1A003GMT-HF-3TR : in RoHS-compliant halogen-free PMPAK®5x6, shipped on tape and reel (3000pcs/reel)

PMPAK® is a registered trademark of Advanced Power Electronics Corp.

Electrical Specifications at 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=25A	-	-	0.99	mΩ
		V_{GS}=5V, I_D=25A	-	-	2	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=25A	-	75	-	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=25A	-	70	112	nC
Q_{gs}	Gate-Source Charge	V_{DS}=15V	-	30	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=4.5V	-	30	-	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=15V	-	25	-	ns
t_r	Rise Time	I_D=1A	-	15	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω	-	100	-	ns
t_f	Fall Time	V_{GS}=10V	-	60	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	9800	15680	pF
C_{oss}	Output Capacitance	V_{DS}=15V	-	1070	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	710	-	pF
R_g	Gate Resistance	f=1.0MHz	-	1.1	2.2	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage[2]	I_S=20A, V_{GS}=0V	-	-	1.2	V
t_{rr}	Reverse Recovery Time	I_S=10A, V_{GS}=0V,	-	40	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	35	-	nC

Notes:

1.Pulse width limited by maximum 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. Package limitation current is 60A.

Typical Electrical Characteristics

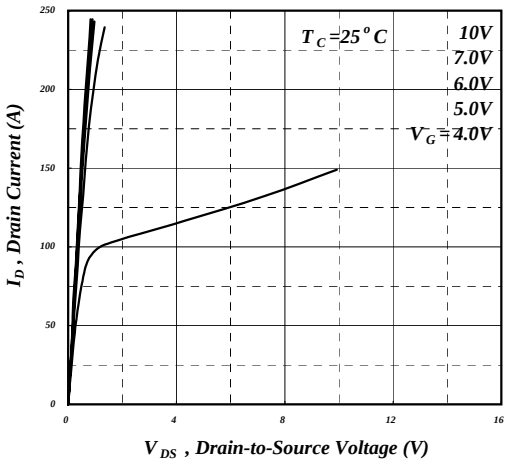


Fig 1. Typical Output Characteristics

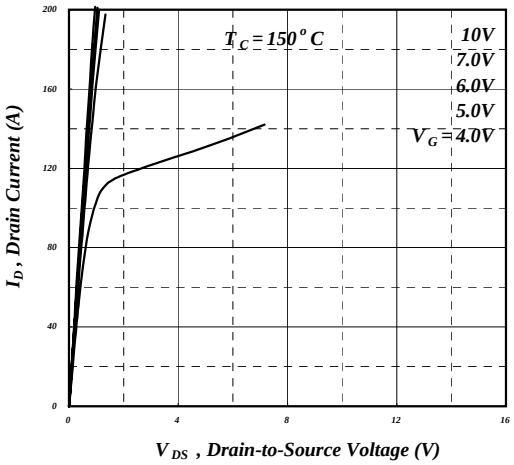


Fig 2. Typical Output Characteristics

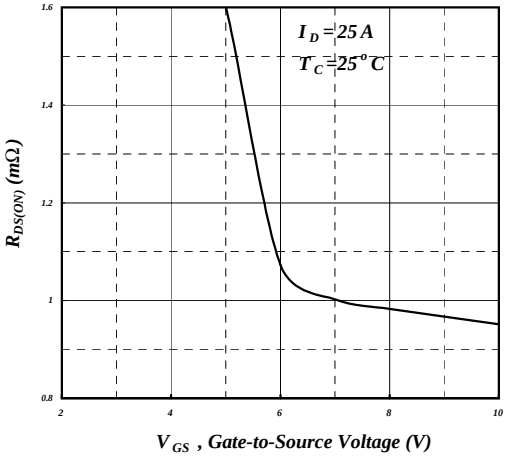


Fig 3. On-Resistance vs. Gate Voltage

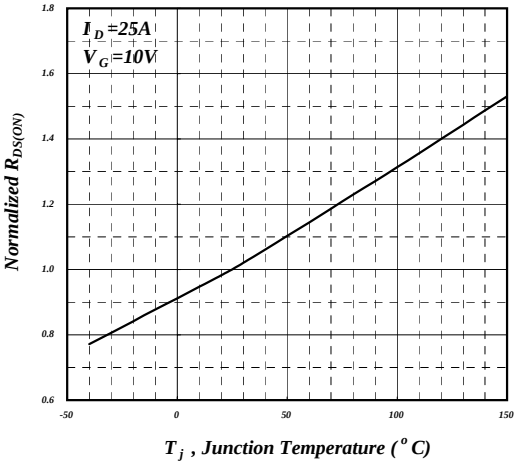


Fig 4. Normalized On-Resistance vs. Junction Temperature

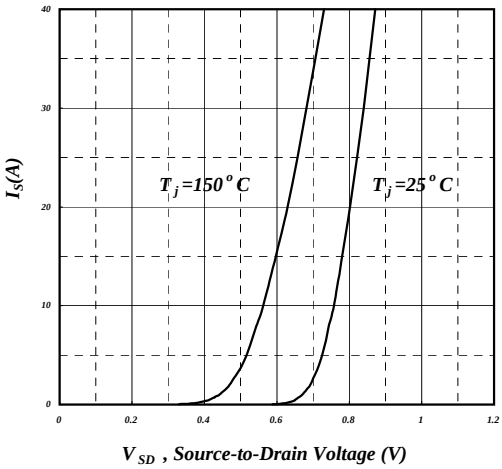


Fig 5. Forward Characteristic of Reverse Diode

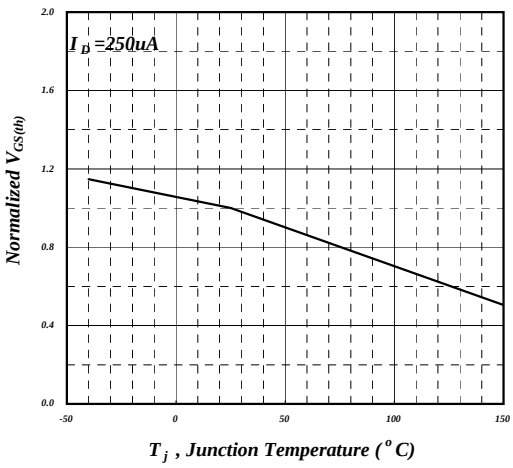


Fig 6. Gate Threshold Voltage vs. Junction Temperature

Typical Electrical Characteristics (cont.)

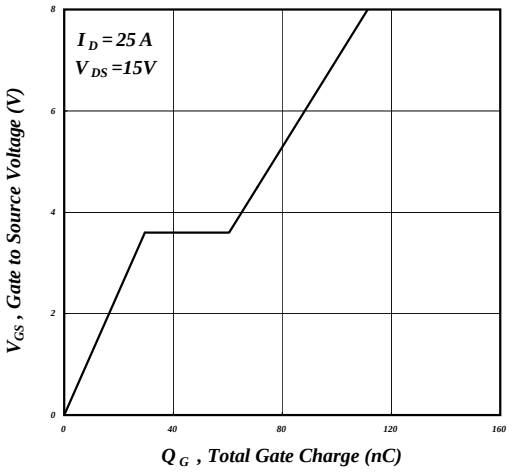


Fig 7. Gate Charge Characteristics

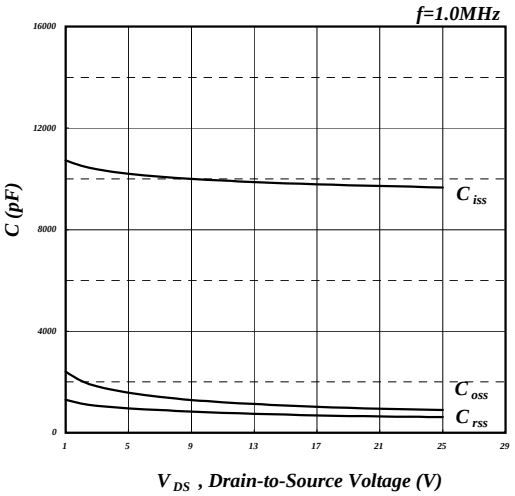


Fig 8. Typical Capacitance Characteristics

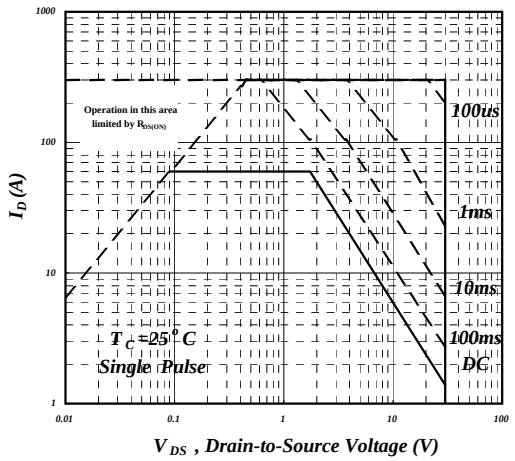


Fig 9. Maximum Safe Operating Area

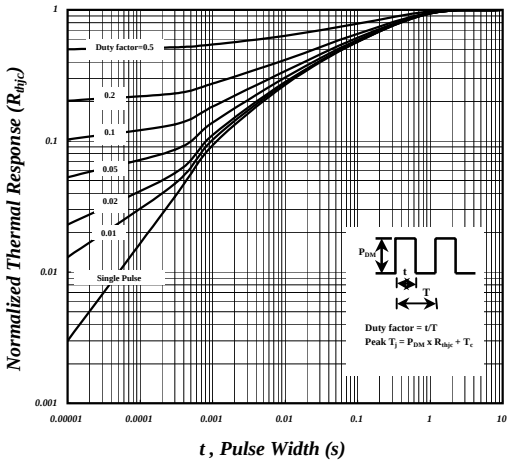


Fig 10. Effective Transient Thermal Impedance

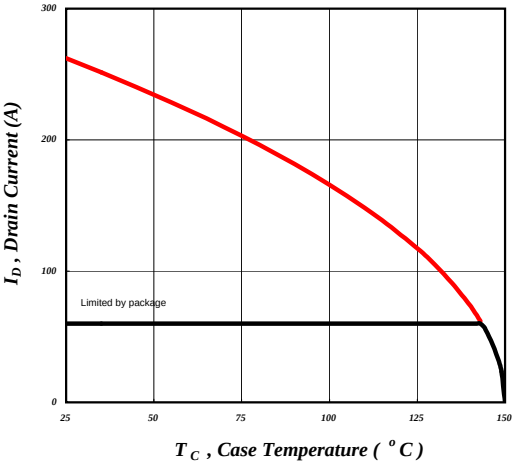


Fig 11. Maximum Continuous Drain Current v.s. Case Temperature

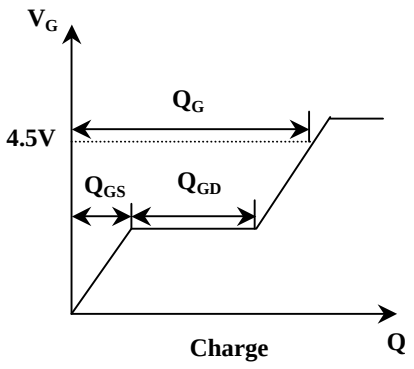
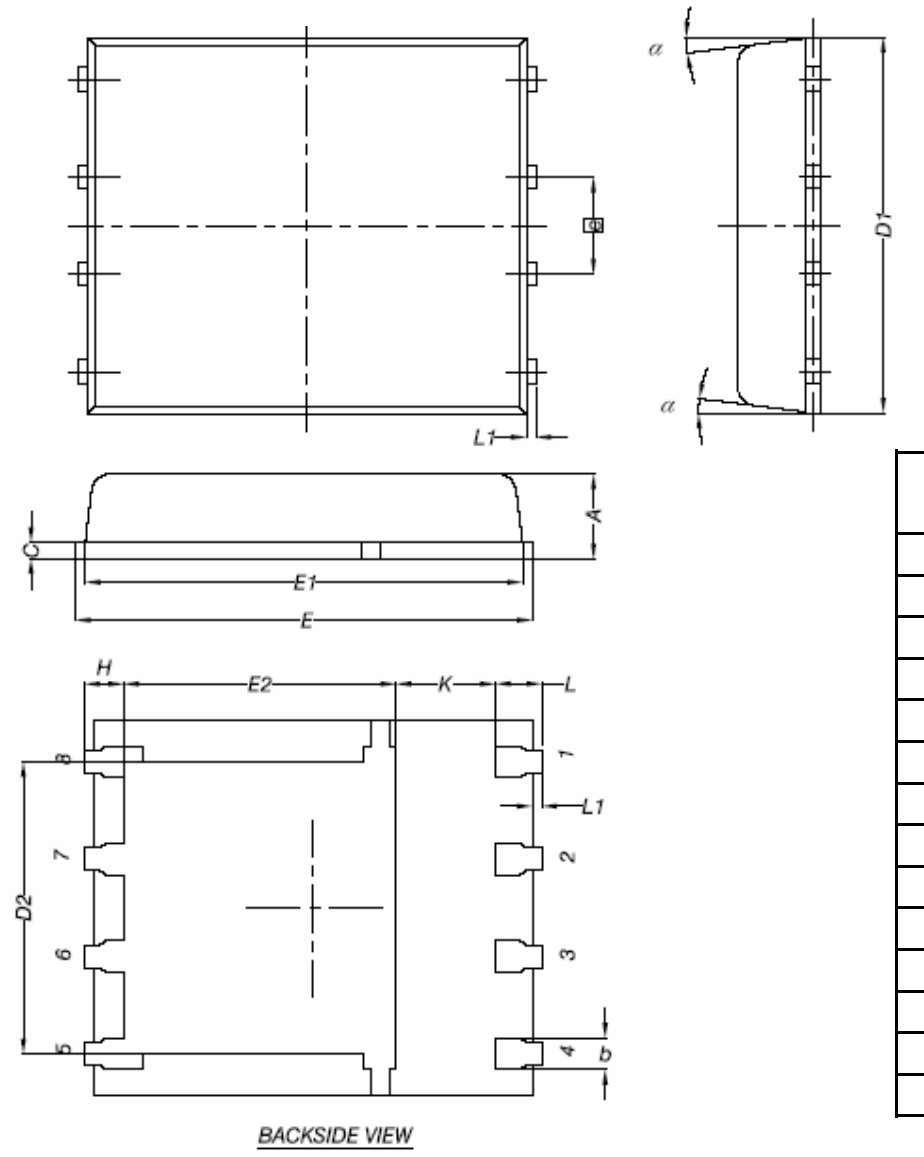


Fig 12. Gate Charge Waveform

Package Dimensions: PMPAK®5x6



SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	0.90	1.00	1.10
b	0.33	0.41	0.51
C	0.20	-	-
D1	4.80	4.90	5.10
D2	-	-	4.20
E	5.90	6.00	6.10
E1 (Reference)	5.70	5.75	5.80
E2 (Reference)	3.38	3.58	3.78
e	1.27 BSC		
H	-	-	0.62
K (Reference)	0.70	-	-
L	0.51	0.61	0.71
L1	-	-	0.20
α(Reference)	0°	-	12°

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

Marking Information: