



**Advanced Power  
Electronics Corp.**

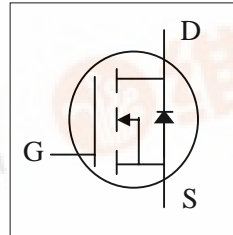
**AP85U03GMT**

**RoHS-compliant Product**

*N-CHANNEL ENHANCEMENT MODE*

*POWER MOSFET*

- ▼ Simple Drive Requirement
- ▼ SO-8 Compatible
- ▼ Low On-resistance

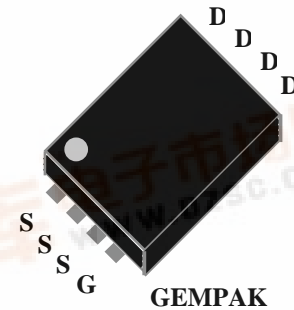


$BV_{DSS}$	30V
$R_{DS(ON)}$	5m $\Omega$
$I_D$	82A

### 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 GEMPAK package is special for DC-DC converters application and the foot print is compatible with SO-8 with backside heat sink.

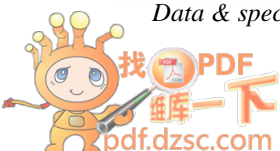


### Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	30	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D @ T_C = 25^\circ C$	Continuous Drain Current	82	A
$I_D @ T_A = 25^\circ C$	Continuous Drain Current <sup>3</sup>	24	A
$I_D @ T_A = 100^\circ C$	Continuous Drain Current <sup>3</sup>	15	A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	200	A
$P_D @ T_C = 25^\circ C$	Total Power Dissipation	50	W
$P_D @ T_A = 25^\circ C$	Total Power Dissipation	5	W
$E_{AS}$	Single Pulse Avalanche Energy <sup>4</sup>	57.6	mJ
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ C$

### Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Thermal Resistance Junction-case	Max. 2.5	$^\circ C/W$
Rthj-a	Thermal Resistance Junction-ambient <sup>3</sup>	Max. 25	$^\circ C/W$





## AP85U03GMT

### Electrical Characteristics @T<sub>j</sub>=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	30	-	-	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A	-	-	5	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A	-	-	10	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	1	-	3	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =10V, I <sub>D</sub> =20A	-	19.5	-	S
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =24V, V <sub>GS</sub> =0V	-	-	1	uA
I <sub>GSS</sub>	Gate-Source Leakage	V <sub>GS</sub> =±20V	-	-	±100	nA
Q <sub>g</sub>	Total Gate Charge <sup>2</sup>	I <sub>D</sub> =30A	-	29	46	nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =24V	-	6.4	-	nC
Q <sub>gd</sub>	Gate-Drain ("Miller") Charge	V <sub>GS</sub> =4.5V	-	19	-	nC
t <sub>d(on)</sub>	Turn-on Delay Time <sup>2</sup>	V <sub>DS</sub> =15V	-	10	-	ns
t <sub>r</sub>	Rise Time	I <sub>D</sub> =30A	-	84	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time	R <sub>G</sub> =3.3Ω, V <sub>GS</sub> =10V	-	27	-	ns
t <sub>f</sub>	Fall Time	R <sub>D</sub> =0.5Ω	-	83	-	ns
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V	-	2400	3840	pF
C <sub>oss</sub>	Output Capacitance	V <sub>DS</sub> =25V	-	395	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance	f=1.0MHz	-	390	-	pF
R <sub>g</sub>	Gate Resistance	f=1.0MHz	-	1.2	1.8	Ω

### Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V <sub>SD</sub>	Forward On Voltage <sup>2</sup>	I <sub>S</sub> =30A, V <sub>GS</sub> =0V	-	-	1.2	V
t <sub>rr</sub>	Reverse Recovery Time <sup>2</sup>	I <sub>S</sub> =10A, V <sub>GS</sub> =0V,	-	33	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge	di/dt=100A/μs	-	30	-	nC

#### Notes:

- 1.Pulse width limited by Max. junction temperature
- 2.Pulse test
- 3.Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board, t ≤10sec
- 4.Starting T<sub>j</sub>=25°C , V<sub>DD</sub>=20V , L=0.1mH , R<sub>G</sub>=25Ω.

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.

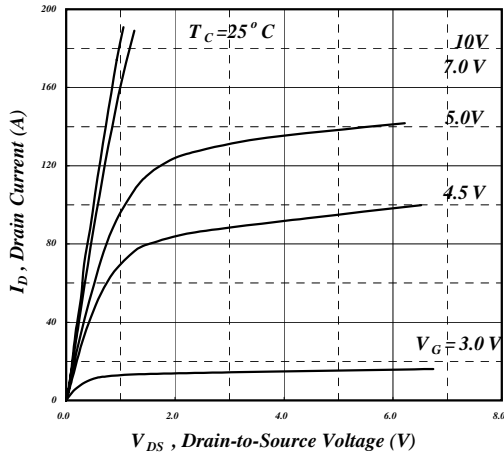


Fig 1. Typical Output Characteristics

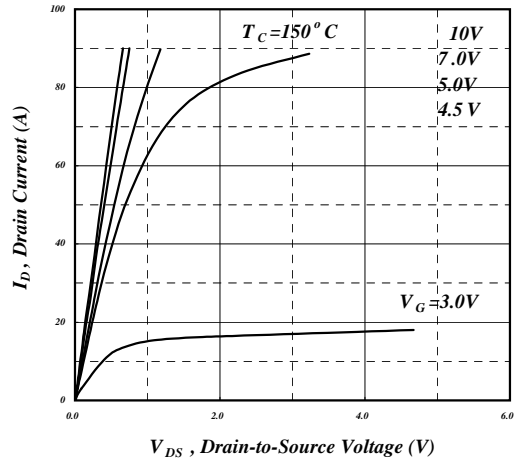


Fig 2. Typical Output Characteristics

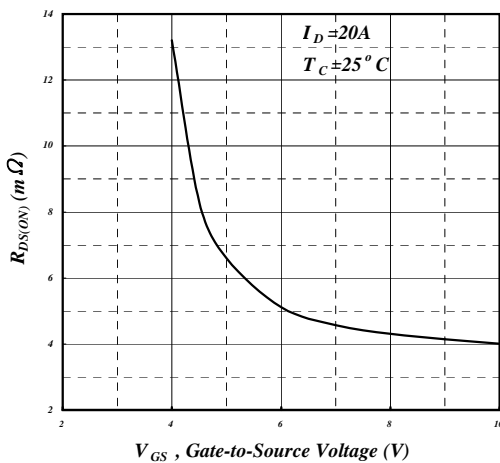


Fig 3. On-Resistance v.s. Gate Voltage

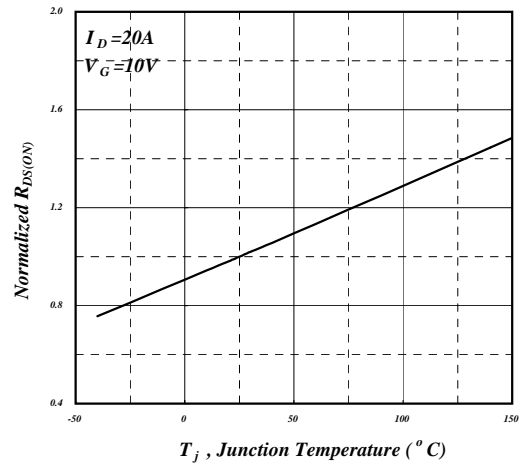


Fig 4. Normalized On-Resistance v.s. Junction Temperature

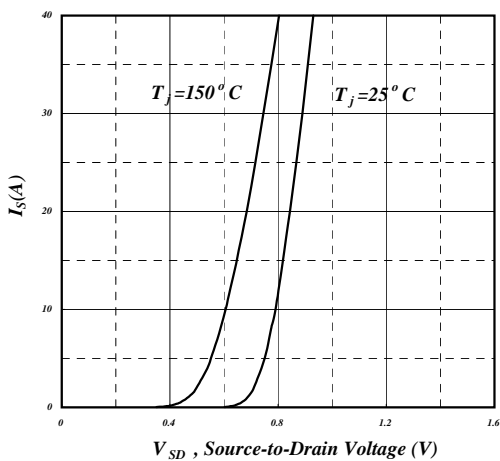


Fig 5. Forward Characteristic of Reverse Diode

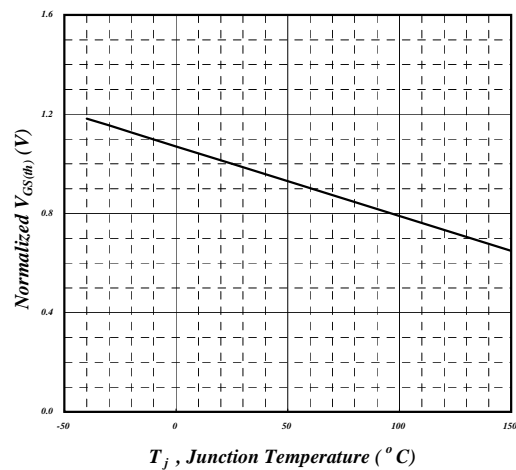


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

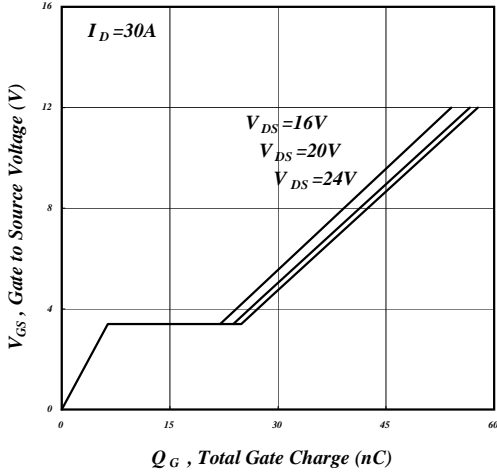


Fig 7. Gate Charge Characteristics

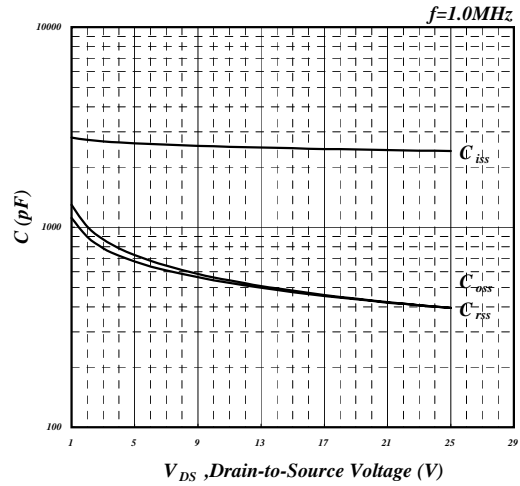


Fig 8. Typical Capacitance Characteristics

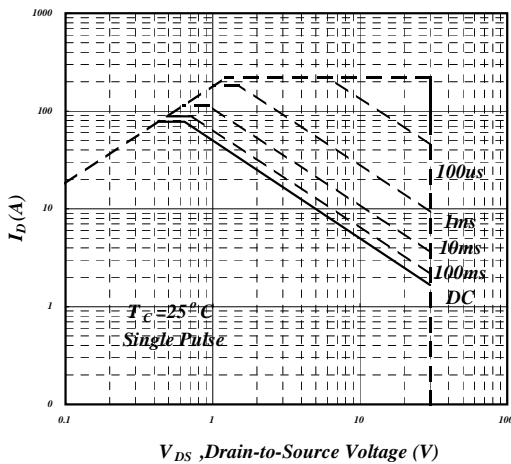


Fig 9. Maximum Safe Operating Area

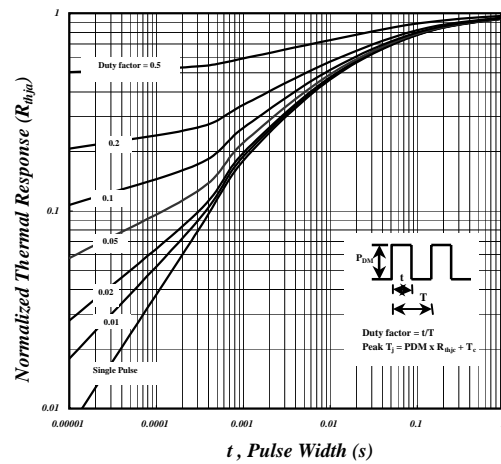


Fig 10. Effective Transient Thermal Impedance

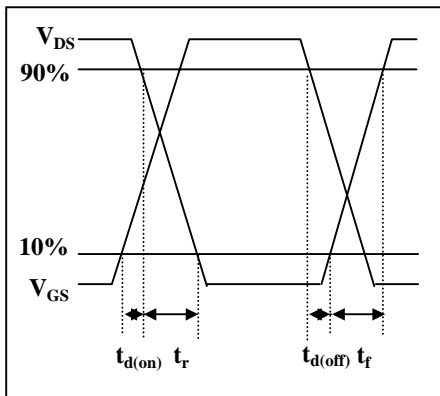


Fig 11. Switching Time Waveform

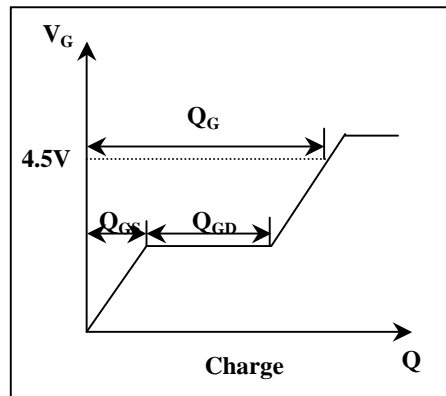
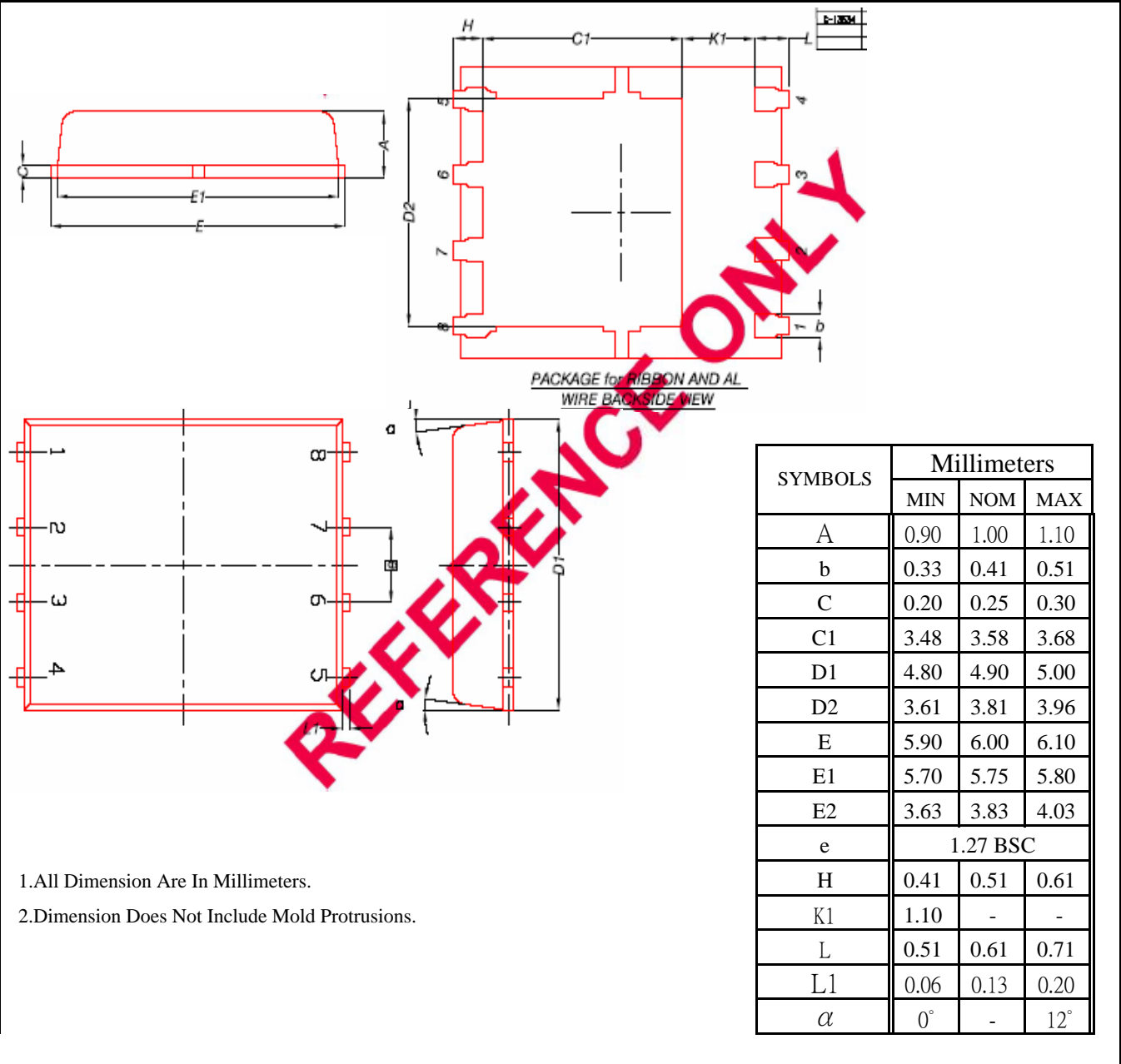


Fig 12. Gate Charge Waveform



## Package Outline : GEM-PAK



## Part Marking Information & Packing : GEM-PAK

