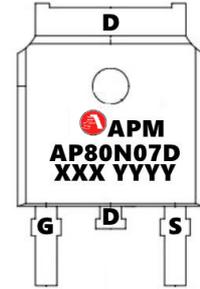
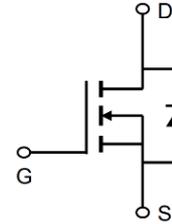


## 68V N-Channel Enhancement Mode MOSFET

### Description

The AP80N07D uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



### General Features

$V_{DS} = 68V$   $I_D = 80A$

$R_{DS(ON)} < 8.6m\Omega @ V_{GS}=10V$  (Type:  $6.5m\Omega$ )

### Application

- Battery protection
- Load switch
- Uninterruptible power supply



### Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP80N07D	TO252-3L	AP80N07D XXX YYYY	2500

### Absolute Maximum Ratings ( $T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V <sub>DS</sub>	Drain-Source Voltage	68	V
V <sub>GS</sub>	Gate-Source Voltage	±20	V
$I_D@T_C=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	80	A
$I_D@T_C=100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	52	A
IDM	Pulsed Drain Current <sup>2</sup>	320	A
EAS	Single Pulse Avalanche Energy <sup>3</sup>	121	mJ
IAS	Avalanche Current	22	A
$P_D@T_C=25^\circ C$	Total Power Dissipation <sup>4</sup>	116	W
TSTG	Storage Temperature Range	-55 to 150	°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to 150	°C
R <sub>θJA</sub>	Thermal Resistance Junction-ambient <sup>1</sup>	63	°C/W
R <sub>θJC</sub>	Thermal Resistance Junction-Case <sup>1</sup>	0.85	°C/W

## 68V N-Channel Enhancement Mode MOSFET

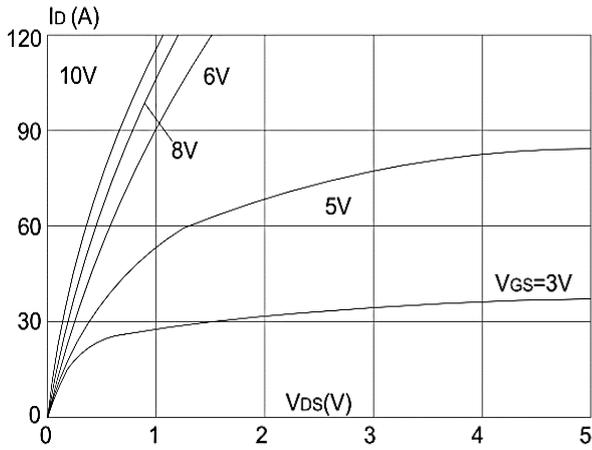
### Electrical Characteristics ( $T_J=25^\circ\text{C}$ , unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	68	72	---	V
$\Delta BVDSS/\Delta T_J$	BVDSS Temperature Coefficient	Reference to $25^\circ\text{C}, I_D=1\text{mA}$	---	0.023	---	V/ $^\circ\text{C}$
RDS(ON)	Static Drain-Source On-Resistance <sup>2</sup>	$V_{GS}=10V, I_D=10A$	---	6.5	8.6	m $\Omega$
VGS(th)	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	2.0	3.0	4.0	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-4.2	---	mV/ $^\circ\text{C}$
IDSS	Drain-Source Leakage Current	$V_{DS}=24V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	uA
		$V_{DS}=24V, V_{GS}=0V, T_J=55^\circ\text{C}$	---	---	5	
IGSS	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA
gfs	Forward Transconductance	$V_{DS}=5V, I_D=10A$	---	5.5	---	S
$R_g$	Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1\text{MHz}$	---	2.3	---	$\Omega$
$Q_g$	Total Gate Charge (4.5V)	$V_{DS}=30V, I_D=20A, V_{GS}=10V$	---	35	---	nC
$Q_{gs}$	Gate-Source Charge		---	11	---	
$Q_{gd}$	Gate-Drain Charge		---	9	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DS}=30V, I_D=20A, R_{GEN}=6\Omega, V_{GS}=10V$	---	15	---	ns
$T_r$	Rise Time		---	94	---	
$T_{d(off)}$	Turn-Off Delay Time		---	46	---	
$T_f$	Fall Time		---	32	---	
$C_{iss}$	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$	---	4062	---	pF
$C_{oss}$	Output Capacitance		---	261	---	
$C_{rss}$	Reverse Transfer Capacitance		---	231	---	
IS	Continuous Source Current <sup>1,5</sup>	$V_G=V_D=0V, \text{Force Current}$	---	---	80	A
ISM	Pulsed Source Current <sup>2,5</sup>		---	---	320	A
VSD	Diode Forward Voltage <sup>2</sup>	$V_{GS}=0V, I_S=80A$	---	---	1.2	V
$t_{rr}$	Reverse Recovery Time	$T_J=25^\circ\text{C}$ $I_F=20A, dI/dt=100A/\mu s$	---	78	---	nS
$Q_{rr}$	Reverse Recovery Charge		---	51	---	nC

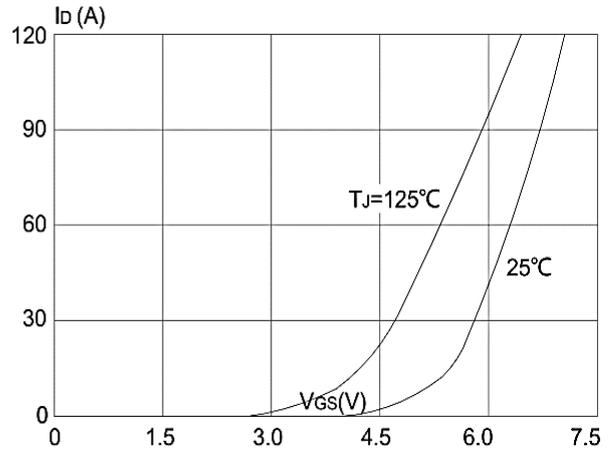
#### Note :

- 1、 The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
- 2、 The data tested by pulsed , pulse width .The EAS data shows Max. rating .
- 3、 The test cond  $\cong 300\mu s$  duty cycle  $\cong 2\%$ , duty cycle ition is  $T_J=25^\circ\text{C}, V_{DD}=35V, V_G=10V, R_G=25\Omega, L=0.5\text{mH}, I_{AS}=22A$
- 4、 The power dissipation is limited by  $175^\circ\text{C}$  junction temperature
- 5、 The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

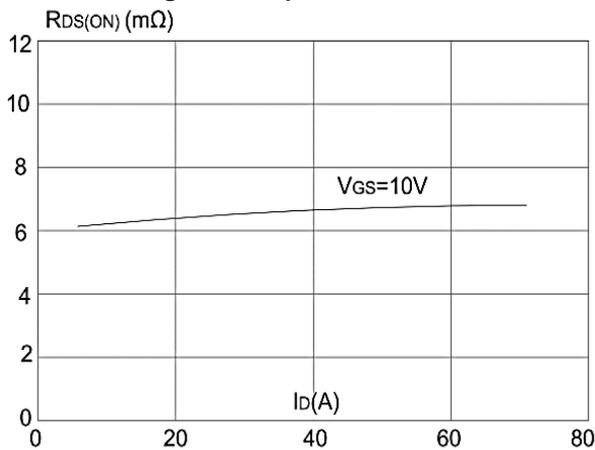
**Typical Characteristics**



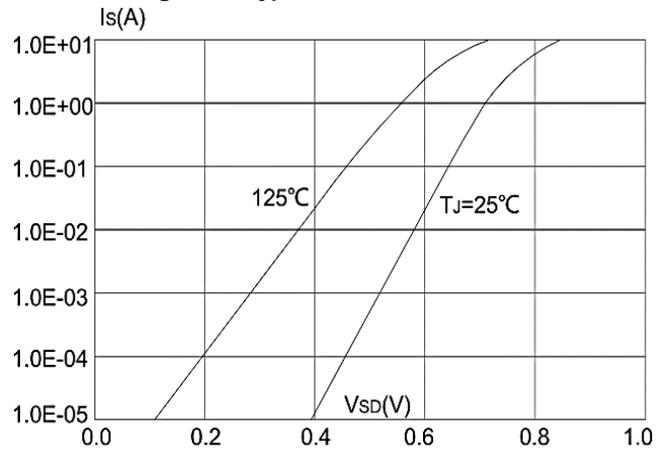
**Figure 1: Output Characteristics**



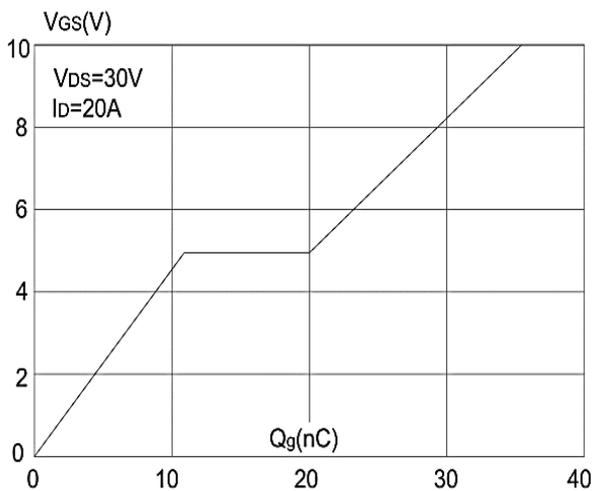
**Figure 2: Typical Transfer Characteristics**



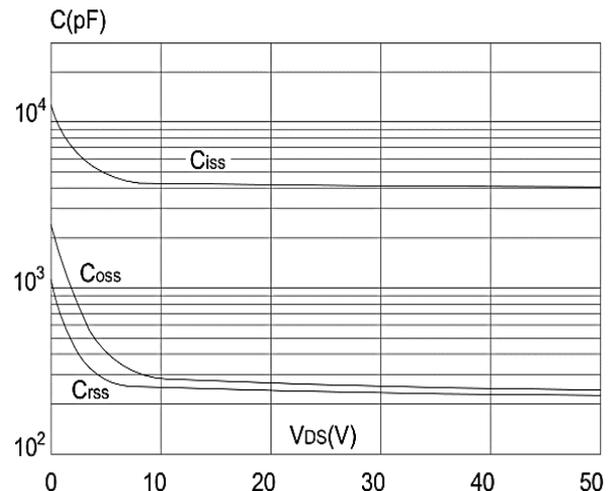
**Figure 3: On-resistance vs. Drain Current**



**Figure 4: Body Diode Characteristics**

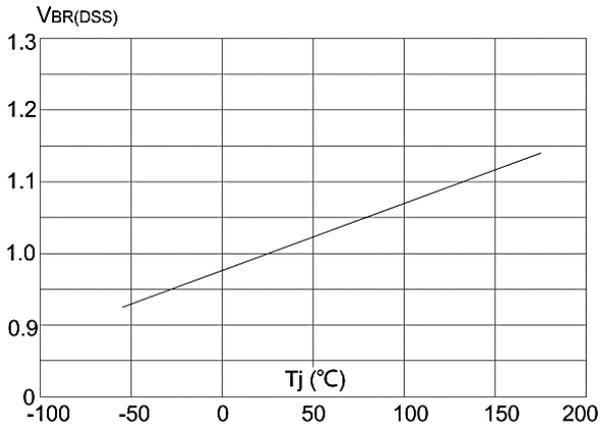


**Figure 5: Gate Charge Characteristics**

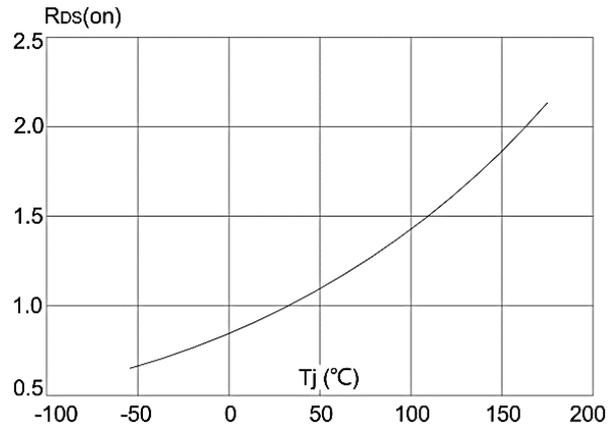


**Figure 6: Capacitance Characteristics**

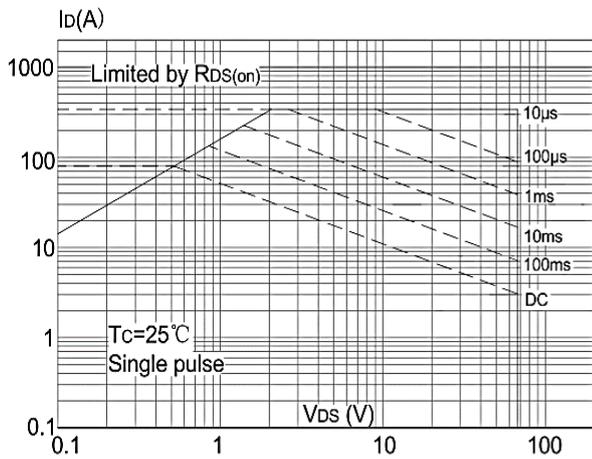
**68V N-Channel Enhancement Mode MOSFET**



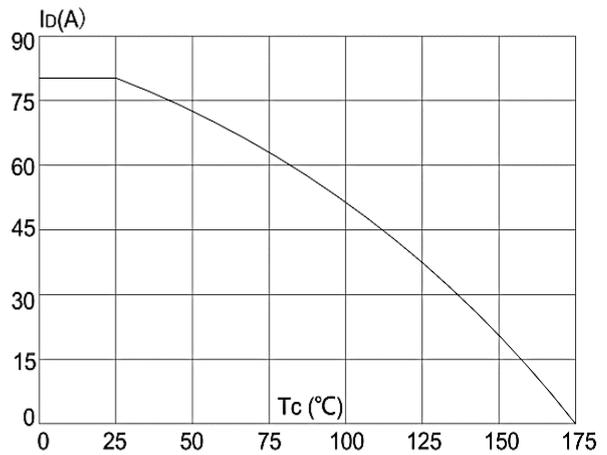
**Figure 7: Normalized Breakdown Voltage vs Junction Temperature**



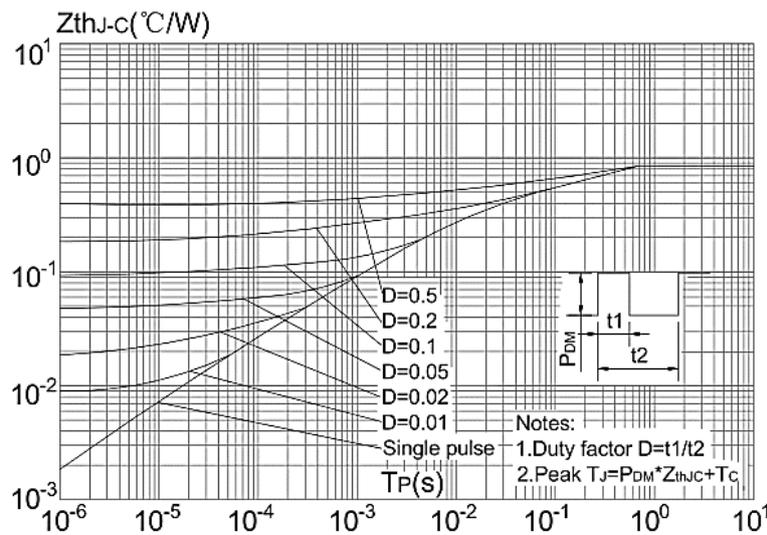
**Figure 8: Normalized on Resistance vs. Junction Temperature**



**Figure 9: Maximum Safe Operating Area**

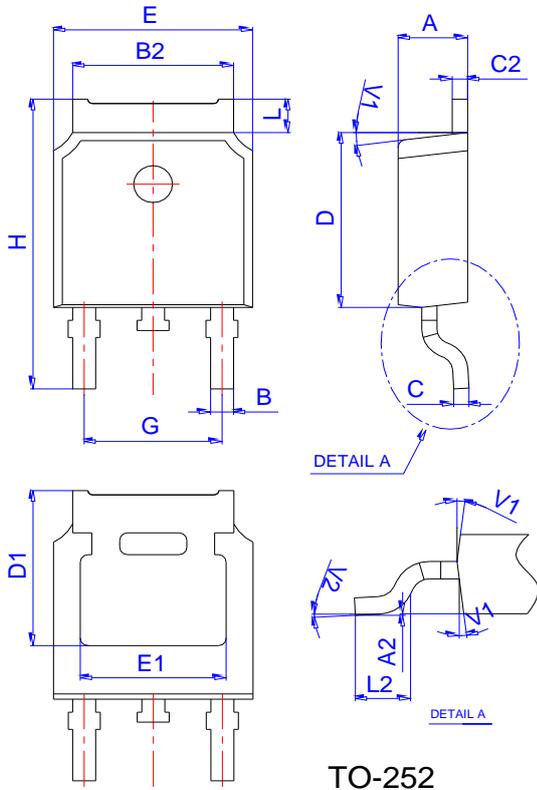


**Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature**



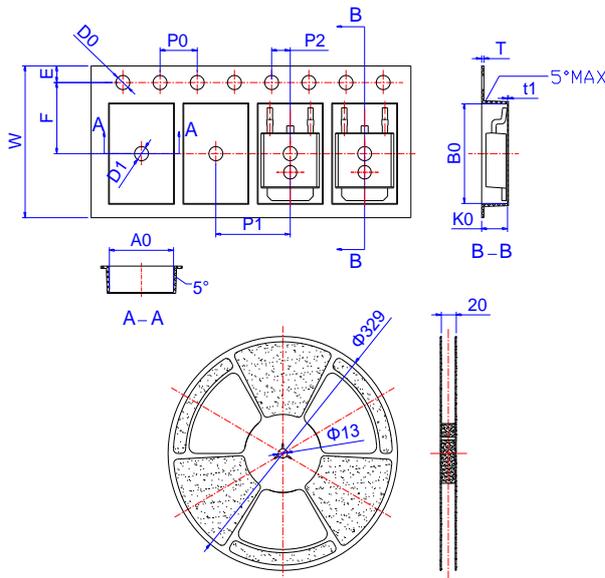
**Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambien**

### Package Mechanical Data: TO-252-3L



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

### Reel Specification-TO-252



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
W	15.90	16.00	16.10	0.626	0.630	0.634
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
D0	1.40	1.50	1.60	0.055	0.059	0.063
D1	1.40	1.50	1.60	0.055	0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.90	2.00	2.10	0.075	0.079	0.083
A0	6.85	6.90	7.00	0.270	0.271	0.276
B0	10.45	10.50	10.60	0.411	0.413	0.417
K0	2.68	2.78	2.88	0.105	0.109	0.113
T	0.24		0.27	0.009		0.011
t1	0.10			0.004		
10P0	39.80	40.00	40.20	1.567	1.575	1.583

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RVE1.0	2020/12/21	Initial release
RVE1.1	2025/8/6	Update LOGO

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