



Description

The AP4242AYT 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

$V_{DS} = 30V$ $I_D = 30A$

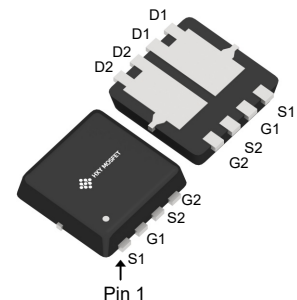
$R_{DS(ON)} < 12m\Omega$ @ $V_{GS}=10V$

Application

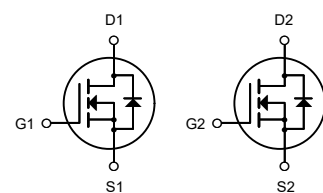
Lithium battery protection

Wireless impact

Mobile phone fast charging



DFN3X3B-8L



Dual N-Channel MOSFET

Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
AP4242AYT	DFN3X3B-8L	HXY MOSFET	5000

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

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	30	V
VGS	Gate-Source Voltage	± 20	V
$I_{D@T_C=25^{\circ}C}$	Continuous Drain Current, V_{GS} @ 10V ¹	30	A
$I_{D@T_C=100^{\circ}C}$	Continuous Drain Current, V_{GS} @ 10V ¹	23	A
IDM	Pulsed Drain Current ²	66	A
EAS	Single Pulse Avalanche Energy ³	27.2	mJ
IAS	Avalanche Current	26	A
$P_D@T_A=25^{\circ}C$	Total Power Dissipation ⁴	2	W
TSTG	Storage Temperature Range	-55 to 150	$^{\circ}C$
TJ	Operating Junction Temperature Range	-55 to 150	$^{\circ}C$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	85	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	25	$^{\circ}C/W$



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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	30	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25°C , $I_D=1mA$	---	0.023	---	$V/^\circ\text{C}$
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V$, $I_D=8A$	---	10	12	$m\Omega$
		$V_{GS}=4.5V$, $I_D=6A$	---	15	18	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	1.2	---	2.5	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-5.08	---	$mV/^\circ\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=24V$, $V_{GS}=0V$, $T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=24V$, $V_{GS}=0V$, $T_J=55^\circ\text{C}$	---	---	5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=5V$, $I_D=8A$	---	24	---	S
R_g	Gate Resistance	$V_{DS}=0V$, $V_{GS}=0V$, $f=1MHz$	---	1.8	---	Ω
Q_g	Total Gate Charge (4.5V)	$V_{DS}=15V$, $V_{GS}=4.5V$, $I_D=8A$	---	9.63	---	nC
Q_{gs}	Gate-Source Charge		---	3.88	---	
Q_{gd}	Gate-Drain Charge		---	3.44	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=15V$, $V_{GS}=10V$, $R_G=1.5\Omega$ $I_D=8A$	---	4.2	---	ns
T_r	Rise Time		---	8.2	---	
$T_{d(off)}$	Turn-Off Delay Time		---	31	---	
T_f	Fall Time		---	4	---	
C_{iss}	Input Capacitance	$V_{DS}=15V$, $V_{GS}=0V$, $f=1MHz$	---	940	---	pF
C_{oss}	Output Capacitance		---	131	---	
C_{rss}	Reverse Transfer Capacitance		---	109	---	

Diode Characteristics

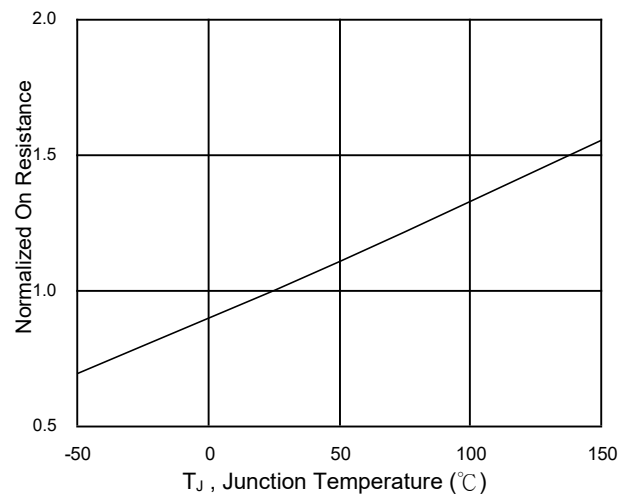
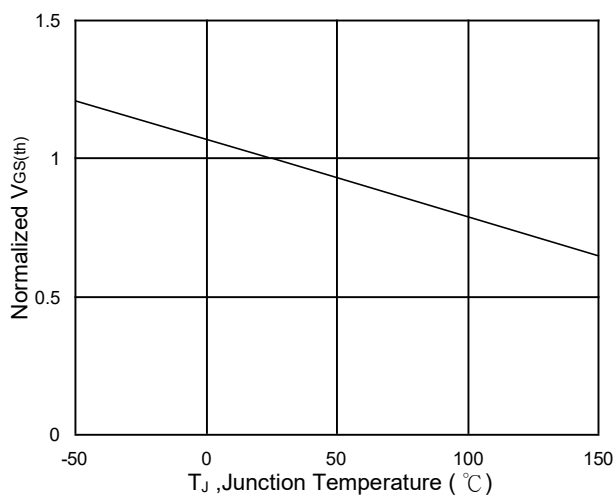
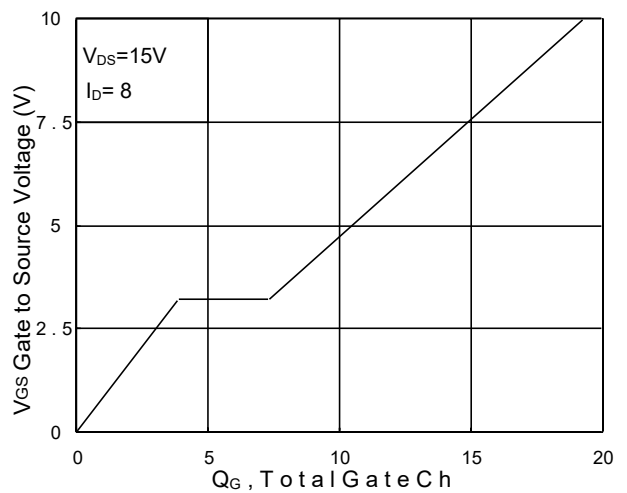
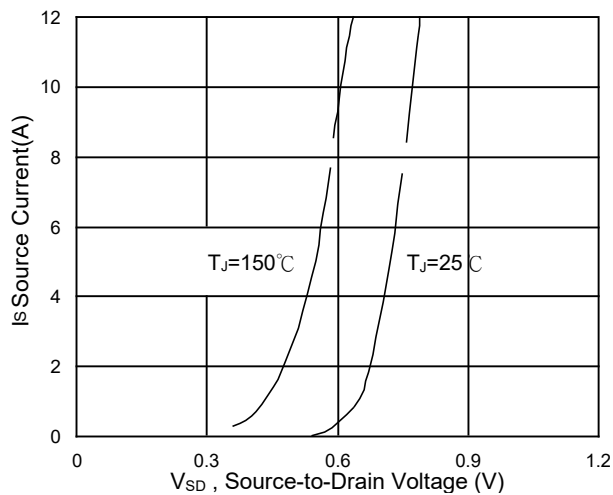
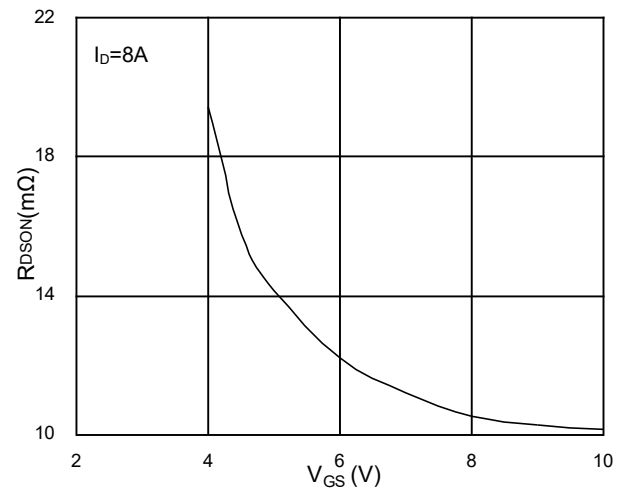
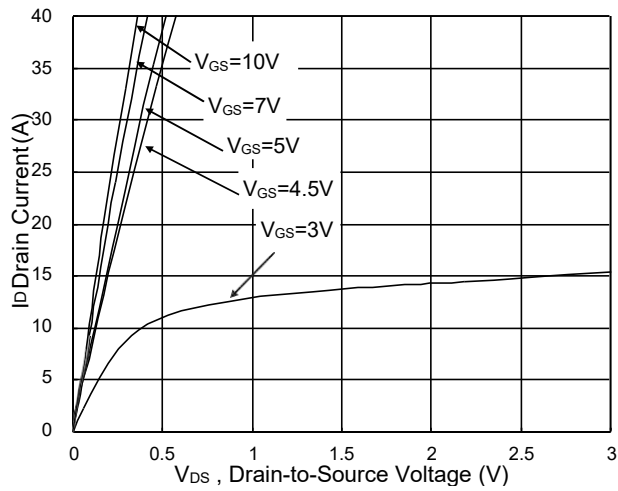
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current ^{1,5}	$V_G=V_D=0V$, Force Current	---	---	9	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V$, $I_S=1A$, $T_J=25^\circ\text{C}$	---	---	1	V
t_{rr}	Reverse Recovery Time	$I_F=8A$, $di/dt=100A/\mu s$, $T_J=25^\circ\text{C}$	---	8	---	nS
Q_{rr}	Reverse Recovery Charge		---	2.9	---	nC

Note :

1. The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
2. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. The EAS data shows Max. rating. The test condition is $V_{DD}=25V$, $V_{GS}=10V$, $L=0.1mH$, $I_{AS}=22A$
4. The power dissipation is limited by 150°C junction temperature
5. The data is theoretically the same as I_D and I_{DM} , in real applications, should be limited by total power dissipation.



Typical Characteristics



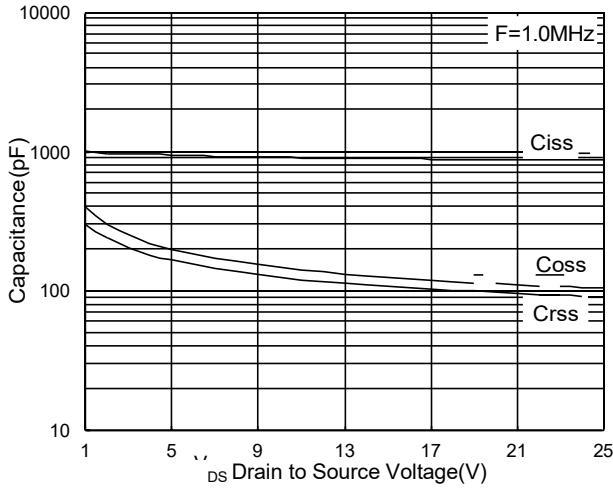


Fig.7 Capacitance

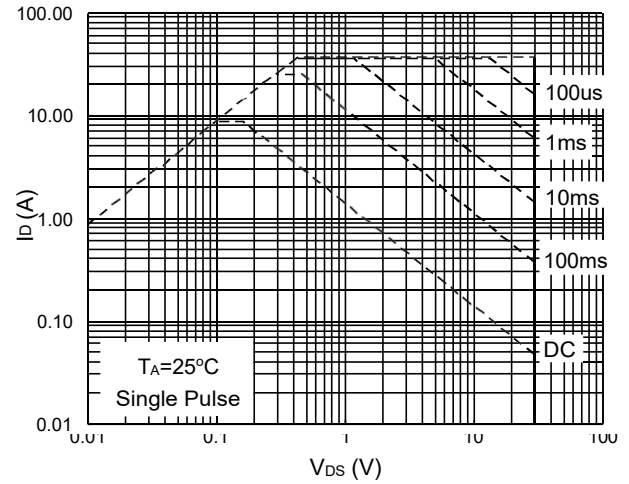


Fig.8 Safe Operating Area

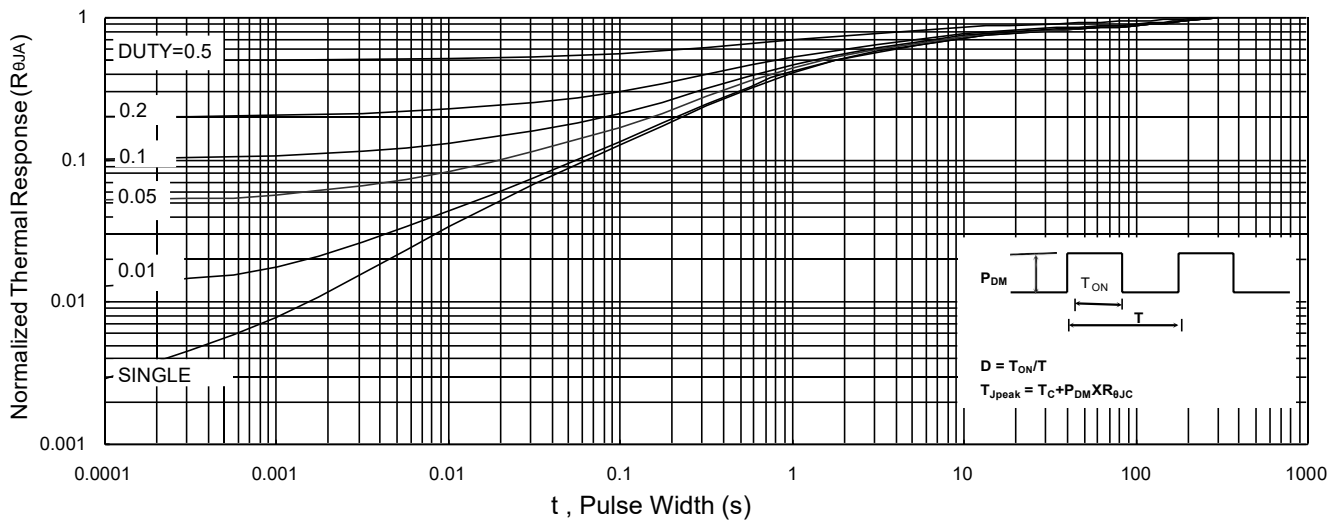
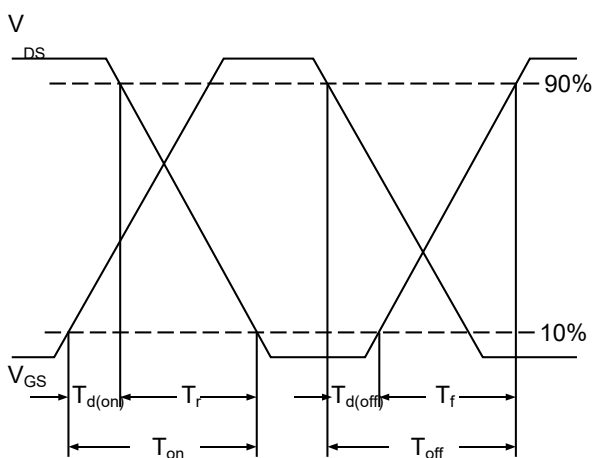


Fig.9 Normalized Maximum Transient Thermal Impedance



$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{V_{DSS}}{V_{GS}}$$



DFN3X3B-8L Package Information



Symbol	Dimensions In Millimeters		
	Min.	Nom.	Max.
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.48	1.58	1.68
D3	-	0.13	-
E	3.20	3.30	3.40
E1	3.00	3.15	3.20
E2	2.39	2.49	2.59
e	0.65BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	-	0.13	-
M	*	*	0.15
θ		10°	12°



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