

P-Channel Enhancement Mode MOSFET

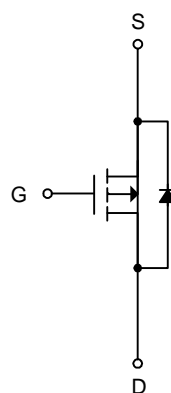
Features

- -20V/-4.5A ,
 $R_{DS(ON)}=28m\Omega$ (typ.) @ $V_{GS}=-4.5V$
 $R_{DS(ON)}=38m\Omega$ (typ.) @ $V_{GS}=-2.5V$
 $R_{DS(ON)}=55m\Omega$ (typ.) @ $V_{GS}=-1.8V$
- Super High Dense Cell Design
- Reliable and Rugged
- Lead Free and Green Devices Available
(RoHS Compliant)

Applications

- Power Management in Notebook Computer, Portable Equipment and Battery Powered Systems

Pin Description



P-Channel MOSFET

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

Symbol	Parameter		Rating	Unit
V_{DSS}	Drain-Source Voltage		-20	V
V_{GSS}	Gate-Source Voltage		± 12	
I_D^*	Continuous Drain Current	$V_{GS} = -4.5\text{V}$	-4.5	A
I_{DM}^*	300 μs Pulsed Drain Current		-18	
I_S^*	Diode Continuous Forward Current		-1	A
T_J	Maximum Junction Temperature		150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range		-55 to 150	
P_D^*	Maximum Power Dissipation	$T_A = 25^\circ\text{C}$	0.83	W
$R_{\theta JA}^*$	Thermal Resistance-Junction to Ambient		150	$^\circ\text{C}/\text{W}$

Note : *Surface Mounted on 1in² pad area, $t \leq 10\text{sec}$.

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

Symbol	Parameter	Test Conditions	APM2317			Unit
			Min.	Typ.	Max.	
STATIC CHARACTERISTICS						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{V}, I_{DS} = -250\mu\text{A}$	-20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = -16\text{V}, V_{GS} = 0\text{V}$	-	-	-1	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_{DS} = -250\mu\text{A}$	-0.5	-0.7	-1	V
I_{GSS}	Gate Leakage Current	$V_{GS} = \pm 12\text{V}, V_{DS} = 0\text{V}$	-	-	± 100	nA
$R_{DS(ON)}^a$	Drain-Source On-State Resistance	$V_{GS} = -4.5\text{V}, I_{DS} = -4.5\text{A}$	-	28	35	m Ω
		$V_{GS} = -2.5\text{V}, I_{DS} = -2.5\text{A}$	-	38	50	
		$V_{GS} = -1.8\text{V}, I_{DS} = -2\text{A}$	-	55	75	
V_{SD}^a	Diode Forward Voltage	$I_{SD} = -1\text{A}, V_{GS} = 0\text{V}$	-	-0.7	-1.3	V
GATE CHARGE CHARACTERISTICS^b						
Q_g	Total Gate Charge	$V_{DS} = -10\text{V}, V_{GS} = -4.5\text{V}, I_{DS} = -4.5\text{A}$	-	14	20	nC
Q_{gs}	Gate-Source Charge		-	2.1	-	
Q_{gd}	Gate-Drain Charge		-	4.7	-	

Electrical Characteristics (Cont.) ($T_A = 25^\circ\text{C}$ unless otherwise noted)

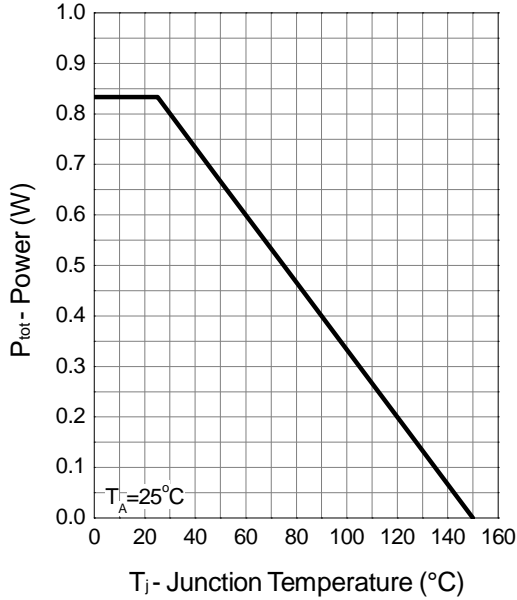
Symbol	Parameter	Test Conditions	APM2317A			Unit
			Min.	Typ.	Max.	
DYNAMIC CHARACTERISTICS^b						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	-	7	-	Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=-10V,$ Frequency=1.0MHz	-	1520	-	pF
C_{oss}	Output Capacitance		-	225	-	
C_{rss}	Reverse Transfer Capacitance		-	165	-	
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=-10V, R_L=10\Omega,$ $I_{DS}=-1A, V_{GEN}=-4.5V,$ $R_G=6\Omega$	-	6	12	ns
t_r	Turn-on Rise Time		-	13	24	
$t_{d(OFF)}$	Turn-off Delay Time		-	86	156	
t_f	Turn-off Fall Time		-	42	77	
t_{rr}	Reverse Recovery Time	$I_{SD}=-4.5A, dI_{SD}/dt = 100A/\mu s$	-	21	-	ns
q_{rr}	Reverse Recovery Charge		-	9	-	nC

Note a : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

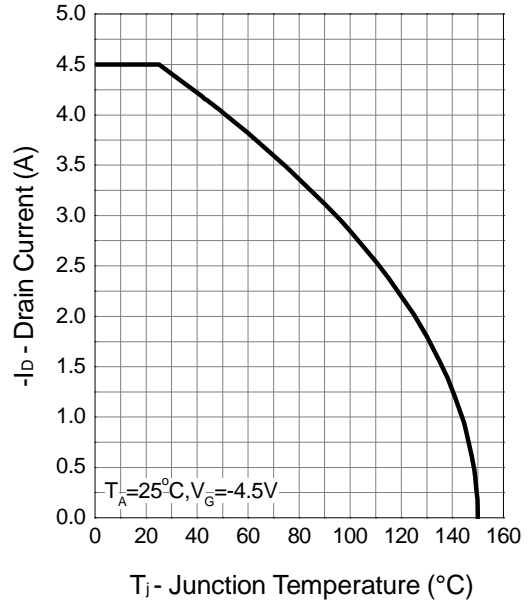
Note b : Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

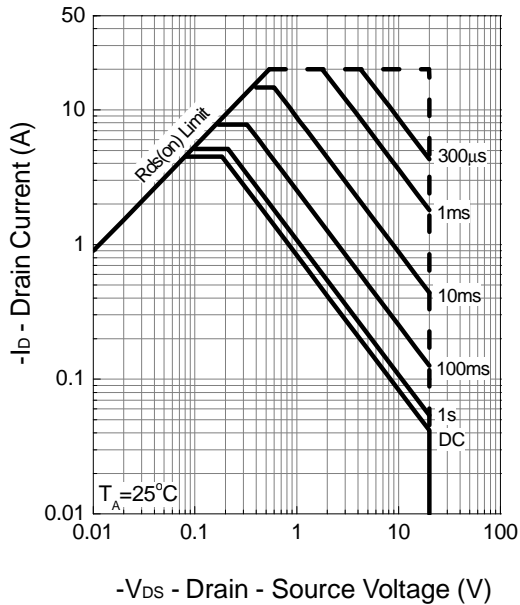
Power Dissipation



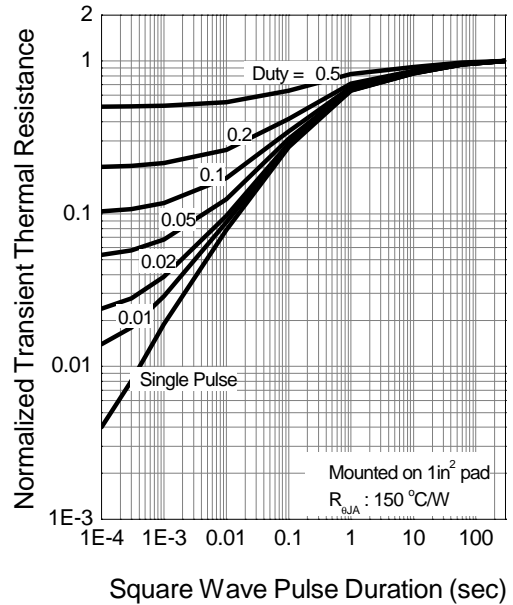
Drain Current



Safe Operation Area

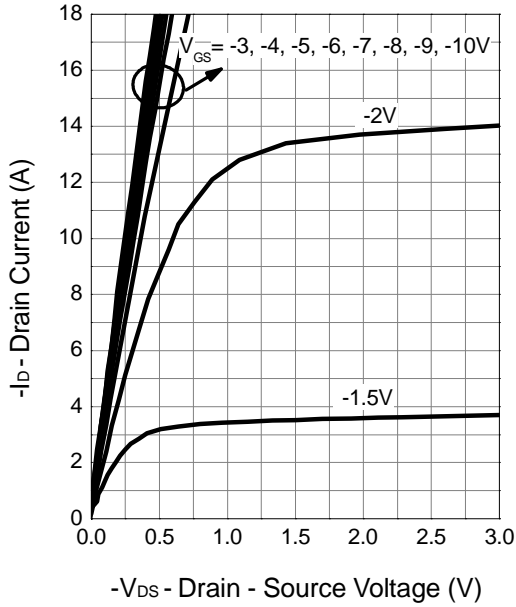


Thermal Transient Impedance

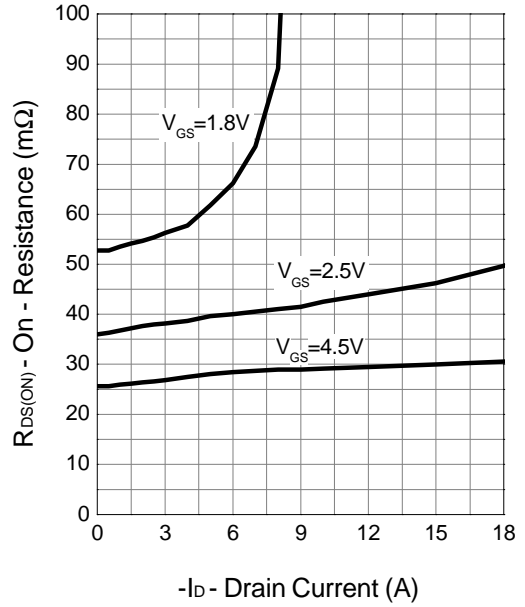


Typical Operating Characteristics (Cont.)

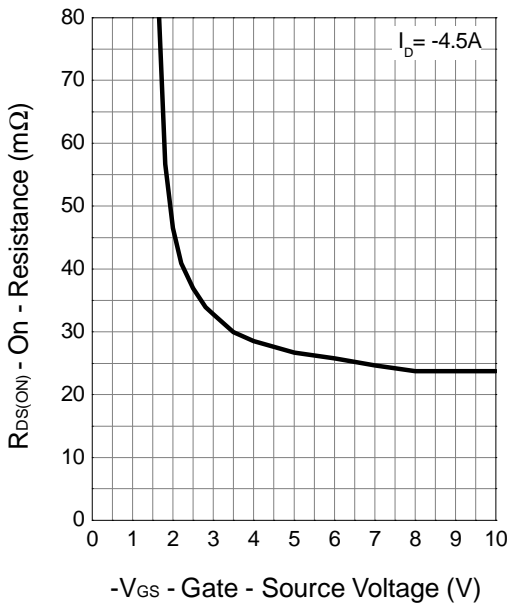
Output Characteristics



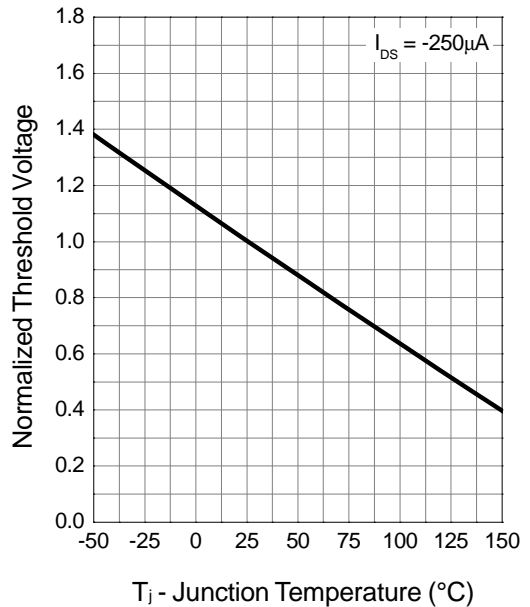
Drain-Source On Resistance



Drain-Source On Resistance

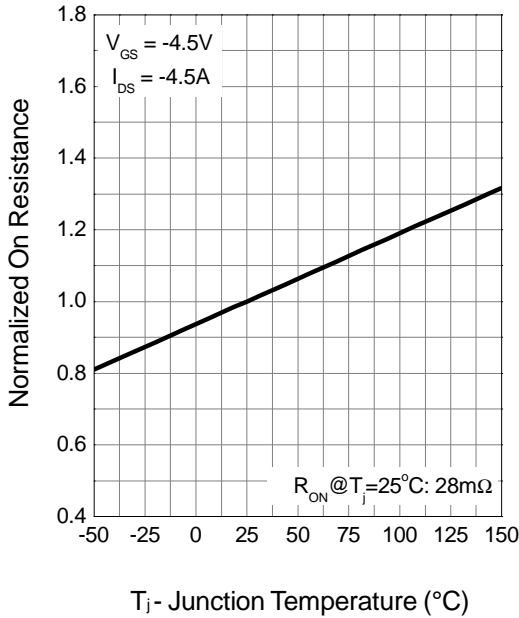


Gate Threshold Voltage

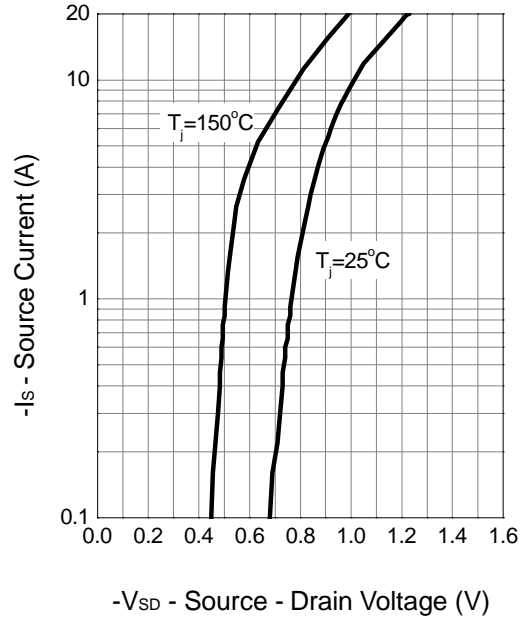


Typical Operating Characteristics (Cont.)

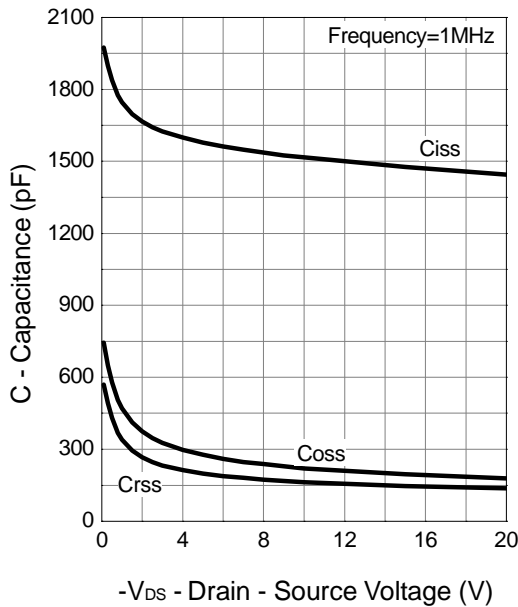
Drain-Source On Resistance



Source-Drain Diode Forward



Capacitance



Gate Charge

