

APM2103SG

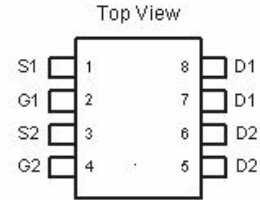


Dual P-Channel Enhancement Mode MOSFET

Features

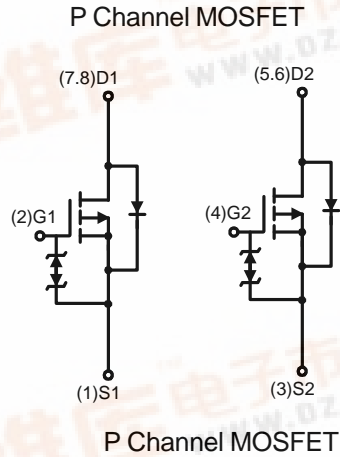
- 20V/-2.5A
 $R_{DS(ON)} = 88m\Omega(\text{typ.}) @ V_{GS} = -4.5V$
 $R_{DS(ON)} = 120m\Omega(\text{typ.}) @ V_{GS} = -2.5V$
 $R_{DS(ON)} = 160m\Omega(\text{typ.}) @ V_{GS} = -1.8V$
- Super High Dense Cell Design
- Reliable and Rugged

Pin Description



Applications

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



Ordering and Marking Information

APM2103 <ul style="list-style-type: none"> Lead Free Code Handling Code Temp. Range Package Code 	Package Code SG : JSC70-8 Operating Junction Temp. Range C : -55 to 150 °C Handling Code TR : Tape & Reel Lead Free Code L : Lead Free Device Blank : Original Device
APM2103 : M2103	XXXXX - Date Code

Note: ANPEC lead-free products contain molding compounds/die attach materials and 100% matte tin plate termination finish; which are fully compliant with RoHS and compatible with both SnPb and lead-free soldering operations. ANPEC lead-free products meet or exceed the lead-free requirements of IPC/JEDEC J STD-020C for MSL classification at lead-free peak reflow temperature.



ANPEC reserves the right to make changes to improve reliability or manufacturability without notice, and advise customers to obtain the latest version of relevant information to verify before placing orders.

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	$V_{GS} = -4.5\text{V}$ -2.5	A	
I_{DM}^*	300 μs Pulsed Drain Current			-10
I_S^*	Diode Continuous Forward Current	-1.3	A	
T_J	Maximum Junction Temperature	150	$^\circ\text{C}$	
T_{STG}	Storage Temperature Range	-55 to 150		
P_D^*	Maximum Power Dissipation	$T_A = 25^\circ\text{C}$	1.14	W
		$T_A = 100^\circ\text{C}$	0.45	
$R_{\theta JA}^*$	Thermal Resistance-Junction to Ambient	110	$^\circ\text{C/W}$	

Notes: *Surface Mounted on 1in² pad area, $t \leq 5\text{sec}$.

Electrical Characteristics ($T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Condition	APM2103SG			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	$V_{DS} = -16\text{V}, V_{GS} = 0\text{V}$ $T_J = 85^\circ\text{C}$			-1	μA
					-30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_{DS} = -250\mu\text{A}$	-0.5	-0.7	-1	V
I_{GSS}	Gate Leakage Current	$V_{GS} = \pm 10\text{V}, V_{DS} = 0\text{V}$			± 10	μA
$R_{DS(ON)}^a$	Drain-Source On-State Resistance	$V_{GS} = -4.5\text{V}, I_{DS} = -2.5\text{A}$		88	110	m Ω
		$V_{GS} = -2.5\text{V}, I_{DS} = -2\text{A}$		120	160	
		$V_{GS} = -1.8\text{V}, I_{DS} = -1\text{A}$		160	260	
V_{SD}^a	Diode Forward Voltage	$I_{SD} = -1.3\text{A}, V_{GS} = 0\text{V}$		-0.8	-1.3	V
Gate Charge Characteristics ^b						
Q_g	Total Gate Charge	$V_{DS} = -10\text{V}, V_{GS} = -4.5\text{V},$ $I_{DS} = -2.5\text{A}$		5.8	8	nC
Q_{gs}	Gate-Source Charge			1.3		
Q_{gd}	Gate-Drain Charge			1.1		

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

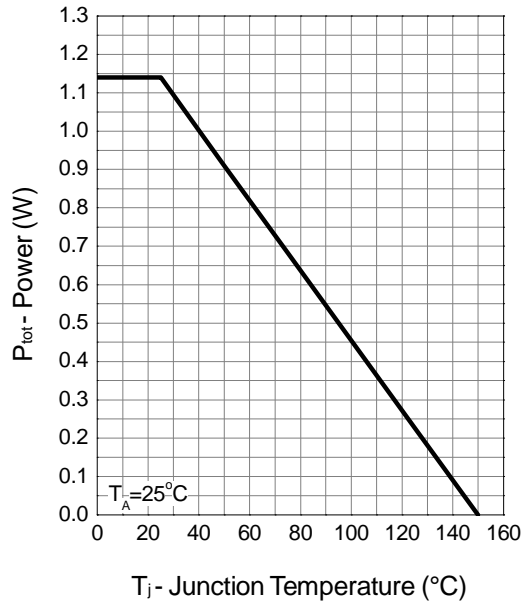
Symbol	Parameter	Test Condition	APM2103SG			Unit
			Min.	Typ.	Max.	
Dynamic Characteristics^b						
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=-10V,$ Frequency=1.0MHz		360		pF
C_{oss}	Output Capacitance			80		
C_{rss}	Reverse Transfer Capacitance			50		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=-10V, R_L=10\Omega,$ $I_{DS}=1A, V_{GEN}=-4.5V,$ $R_G=6\Omega$		8	15	ns
t_r	Turn-on Rise Time			22	41	
$t_{d(OFF)}$	Turn-off Delay Time			29	53	
t_f	Turn-off Fall Time			32	59	
t_{rr}	Reverse Recovery Time	$I_{SD}=-2.5A$ $dl_{SD}/dt = 100A/\mu s$		14		ns
Q_{rr}	Reverse Recovery Charge			6		nc

Notes:

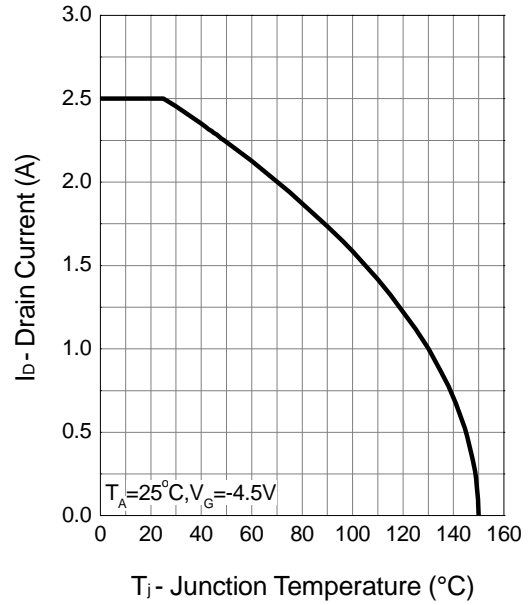
- a : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
b : Guaranteed by design, not subject to production testing.

Typical Characteristics

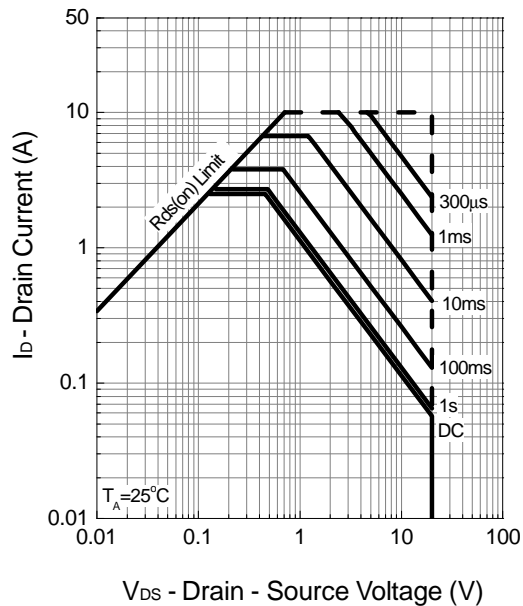
Power Dissipation



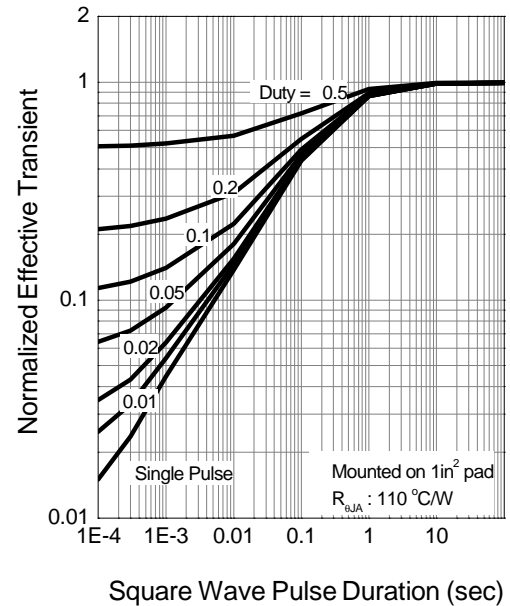
Drain Current



Safe Operation Area

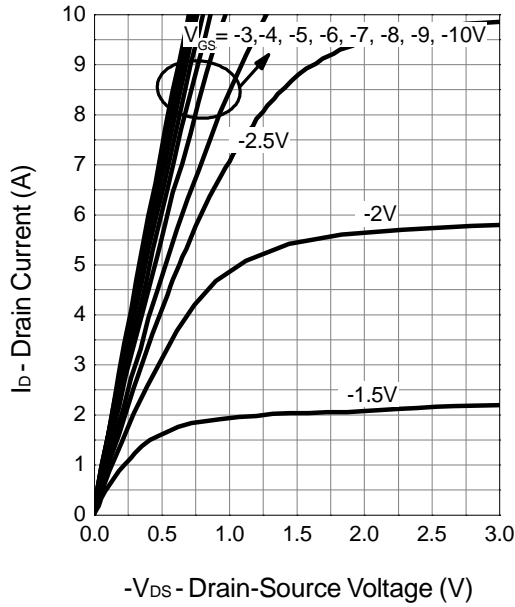


Thermal Transient Impedance

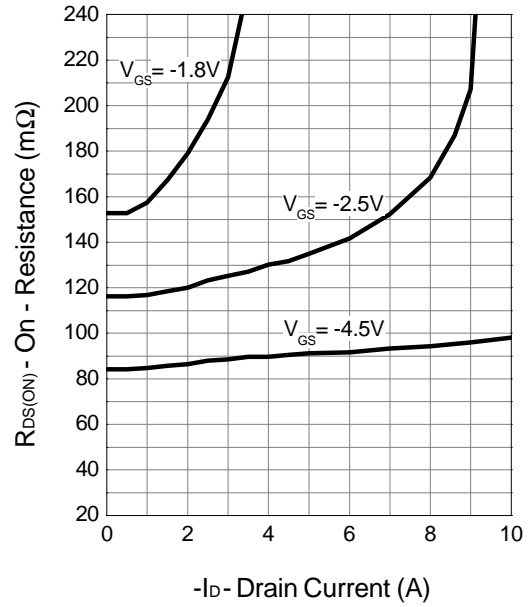


Typical Characteristics (Cont.)

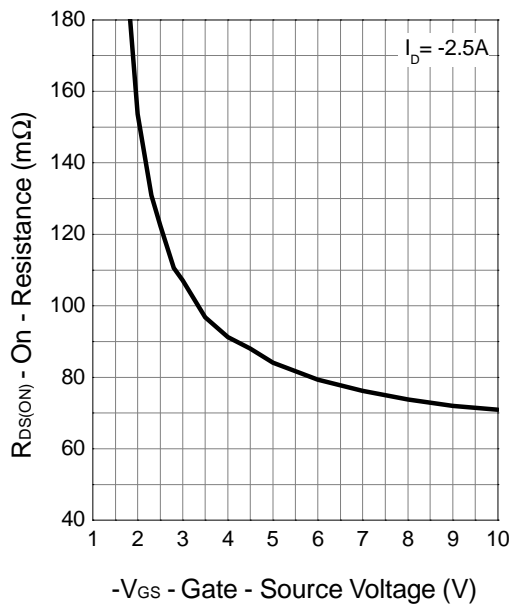
Output Characteristics



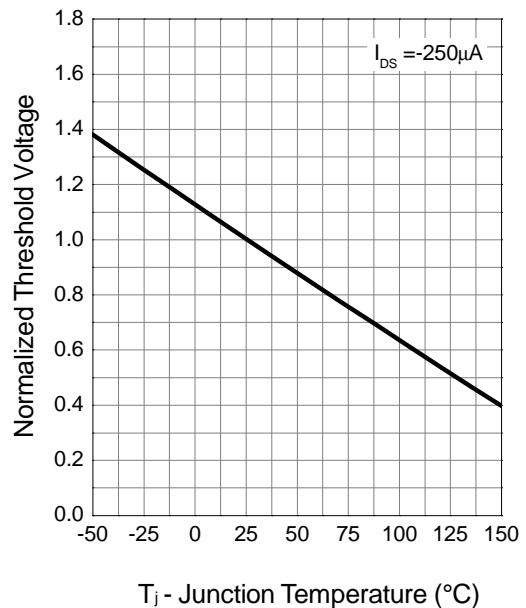
Drain-Source On Resistance



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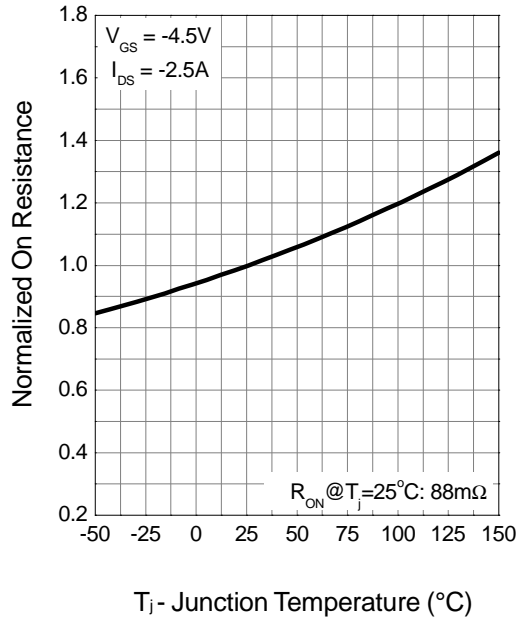


Gate Threshold Voltage

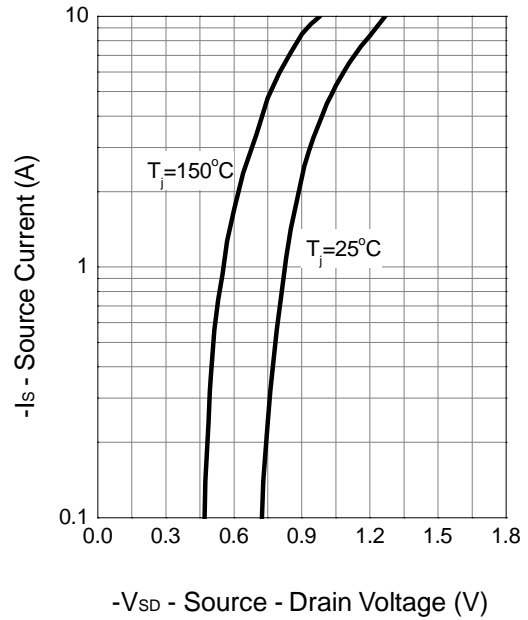


Typical Characteristics (Cont.)

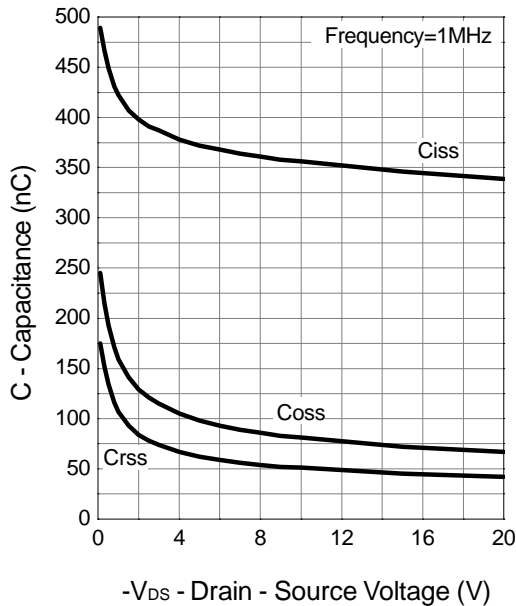
Drain-Source On Resistance



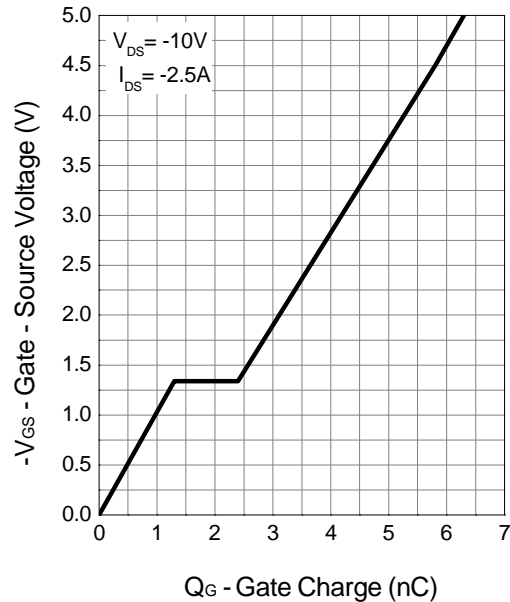
Source-Drain Diode Forward



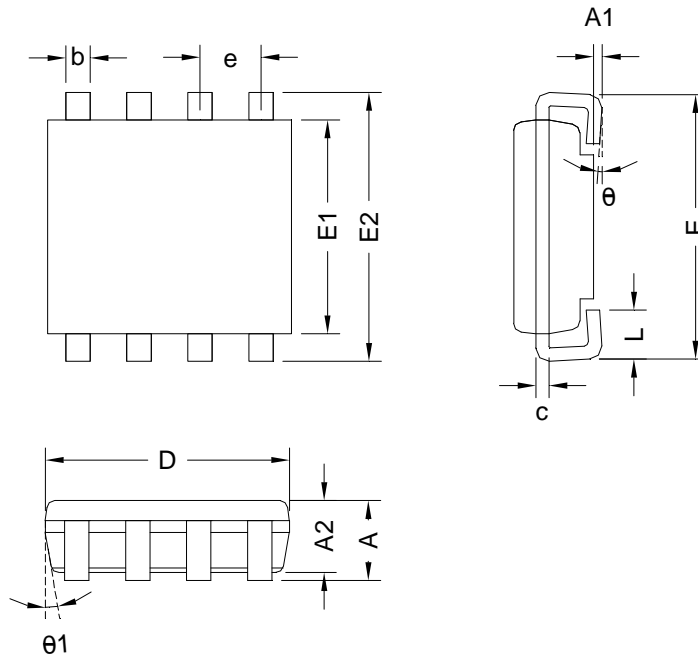
Capacitance



Gate Charge



Packaging Information



Dim	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	-	1.10	-	0.043
A1	0.00	0.10	0.000	0.004
A2	0.70	1.00	0.028	0.039
b	0.15	0.30	0.006	0.012
c	0.10	0.20	0.004	0.008
D	1.80	2.20	0.071	0.087
E	1.80	2.40	0.071	0.094
E1	1.65	1.85	0.065	0.073
E2	2.00	2.40	0.079	0.094
e	0.50 BSC		0.020 BSC	
L	0.35	0.55	0.014	0.022
theta	0	8°	0	8°
theta1	4°	10°	4°	10°

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