



FMM23P20 2.3A 20V P-Channel Enhancement-Mode MOSFET

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$V_{DS} = -20V$

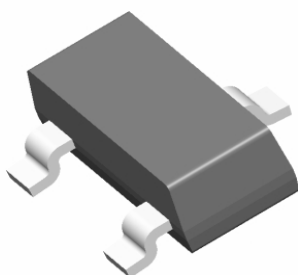
$R_{DS(ON)}, V_{GS} @ -4.5V, I_{DS} @ -2.8A = 100m\Omega$

$R_{DS(ON)}, V_{GS} @ -2.5V, I_{DS} @ -2.0A = 150m\Omega$

Features

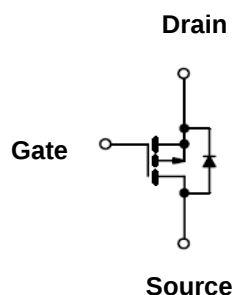
Advanced trench process technology
High Density Cell Design For Ultra Low On-Resistance
Fully Characterized Avalanche Voltage and Current
Improved Shoot-Through FOM

**TO-236
(SOT-23)**



Top View

Internal Schematic Diagram



N-Channel MOSFET

Maximum Ratings and Thermal Characteristics ($T_A = 25^\circ C$ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V _{DS}	-20	V
Gate-Source Voltage		V _{GS}	± 8	
Continuous Drain Current		I _D	-2.3	A
Pulsed Drain Current ¹⁾		I _{DM}	-10	
Maximum Power Dissipation	T _A = 25°C	P _D	0.9	W
	T _A = 75°C		0.57	
Operating Junction and Storage Temperature Range		T _J , T _{stg}	-55 to 150	°C
Avalanche Energy with Single Pulse I _D =50A, V _{DD} =25V, L=0.5mH		E _{AS}		mJ
Junction-to-Case Thermal Resistance		R _{θJC}		°C/W
Junction-to-Ambient Thermal Resistance (PCB mounted) ²⁾		R _{θJA}	145	

Note: 1. Maximum DC current limited by the package

2. 1-in² 2oz Cu PCB board



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P-Channel Enhancement-Mode MOSFET ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = -10\mu A$	-20	-	-	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -2.8A$		69	100	
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = -2.5V, I_D = -2.0A$		83	150	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.45		-0.95	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -9.6V, V_{GS} = 0V$			-1	μA
Gate Body Leakage	I_{GSS}	$V_{GS} = \pm 8V, V_{DS} = 0V$			±100	nA
Gate Resistance	Rg					Ω
Forward Transconductance	g_{fs}	$V_{DS} = -5V, I_D = -4.0A$		6.5		S
Dynamic						
Total Gate Charge	Q_g	$V_{DS} = -6V, I_D = -2.8A$ $V_{GS} = -4.5V$		15.23		nC
Gate-Source Charge	Q_{gs}			5.49		
Gate-Drain Charge	Q_{gd}			2.74		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -6V, R_L = 6\Omega$ $I_D = -1A, V_{GEN} = -4.5V$ $R_G = 6\Omega$		17.28		ns
Turn-On Rise Time	t_r			3.73		
Turn-Off Delay Time	$t_{d(off)}$			36.05		
Turn-Off Fall Time	t_f			6.19		
Input Capacitance	C_{iss}	$V_{DS} = -6V, V_{GS} = 0V$ $f = 1.0\text{ MHz}$		882.51		pF
Output Capacitance	C_{oss}			145.54		
Reverse Transfer Capacitance	C_{rss}			97.26		
Source-Drain Diode						
Max. Diode Forward Current	I_S				-2.4	A
Diode Forward Voltage	V_{SD}	$I_S = -1.6A, V_{GS} = 0V$		-0.8	-1.2	V

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

