



DESCRIPTION

P-channel Enhancement Mode Power MOSFET

FEATURES

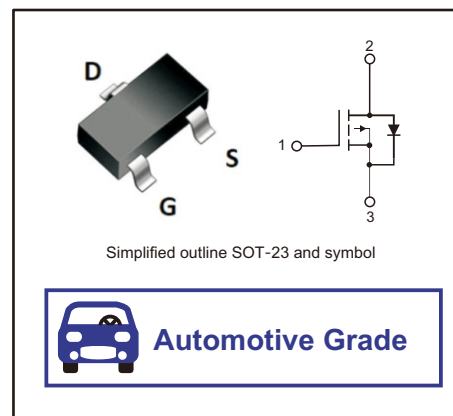
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired
- Qualified to AEC-Q101 Standards for High Reliability

APPLICATION

- PWM Applications
- Load Switch
- Power Management

PINNING

PIN	DESCRIPTION
1	GATE
2	DRAIN
3	SOURCE



MAXIMUM RATINGS (Ta = 25°C unless otherwise noted)

Parameter	Symbol	Value	Unit	
Drain-Source Voltage	V_{DSS}	-20	V	
Gate-Source Voltage	V_{GSS}	8	V	
Continuous Drain Current $T_A=25^\circ\text{C}; t \leq 5\text{s}$ NOTE1	I_D	-5.6	A	
Continuous Drain Current $T_A=25^\circ\text{C}$ NOTE1		-4.5	A	
Continuous Drain Current $T_A=100^\circ\text{C}$ NOTE1		-2.8	A	
Pulsed Drain Current	I_{DM}	-18	A	
Power Dissipation	P_D	$T_{amp}=25^\circ\text{C}$ NOTE2	490	mW
		$T_{amp}=25^\circ\text{C}$ NOTE1	980	mW
		$T_{sp}=25^\circ\text{C}$	4150	mW
Thermal Resistance-Junction to Case	$R_{\theta JA}$		225	K/W
			128	K/W
			85	K/W
Thermal Resistance from Junction to Solder Point	$R_{\theta th(j-sp)}$	30	K/W	
Operation Junction Temperature	T_j	-55 to 150	°C	
Ambient temperature	T_{amb}	-55 to 150	°C	
Storage Temperature	T_{stg}	-65 to 150	°C	

Notes: 1.Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated, mounting pad for drain 6 cm2.

2.Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.



ELECTRICAL CHARACTERISTICS(Ta = 25°C unless otherwise noted.)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
OFF Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = 250uA	-20			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} = -20V, V _{GS} = 0V			-1	uA
Gate- Source Leakage Current	I _{GSS}	V _{GS} = 8V, V _{DS} = 0V			10	uA
		V _{GS} = -8V, V _{DS} = 0V			-10	
		V _{GS} = 4.5V, V _{DS} = 0V			5	
		V _{GS} = -4.5V, V _{DS} = 0V			-5	
On Characteristics						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250uA	-0.45	-0.7	-0.95	V
Static Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} = -4.5V, I _D = -4.5A		27	32	mΩ
		V _{GS} = -4.5V, I _D = -4.5A, T _J = 150°C		40	48	
		V _{GS} = -2.5V, I _D = -3.8A		38	45	
		V _{GS} = -1.8V, I _D = -3A		50	63	
Forward Transconductance	g _{FS}	V _{DS} = -10V, I _D = -2A		15		S
Diode Forward Voltage	V _{SD}	V _{GS} = 0V, I _S = -1.2A		-0.7	-1.2	V
Gate Resistance	R _G	f = 1MHz		10.7		Ω
Dynamic Characteristics						
Input Capacitance	C _{ISS}	V _{DS} = -10V V _{GS} = 0V f = 1.0MHz		1820		pF
Output Capacitance	C _{OSS}			208		
Reverse Transfer Capacitance	C _{RSS}			146		
Switching Characteristics						
Total Gate Charge	Q _g	V _{DS} = -10V V _{GS} = -4.5V I _D = -4.4A		14.7	22.1	nC
Gate-Source Charge	Q _{gs}			2.6		
Gate-Drain Charge	Q _{gd}			2.5		
Switching Characteristics						
Turn-On Delay Time	t _{d(on)}	V _{DS} = -10V, R _{G(ext)} = 6Ω, V _{GS} = -4.5V, I _D = -4.4A		11		ns
Turn-On Rise Time	t _{rr}			30		
Turn-Off Delay Time	t _{d(off)}			83		
Turn-Off Fall Time	t _f			39		
Body Diode Characteristics						
Diode Forward Current	I _S	T _{amb} = 25°C NOTE1			-1.2	A
Electrostatic Discharge Voltage	V _{ESD}	HBM NOTE3			2000	V

Notes: 3.Measured between all pins.



Typical Performance Characteristics

Fig.1: Normalized total power dissipation as a function of junction temperature

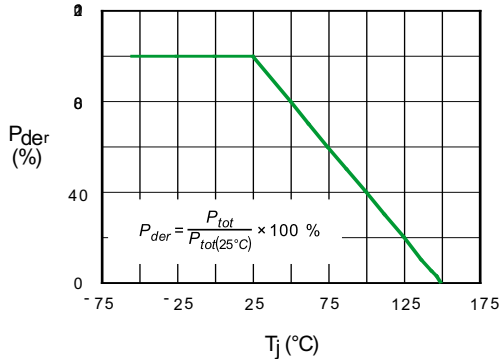


Fig.2: Normalized continuous drain current as a function of junction temperature

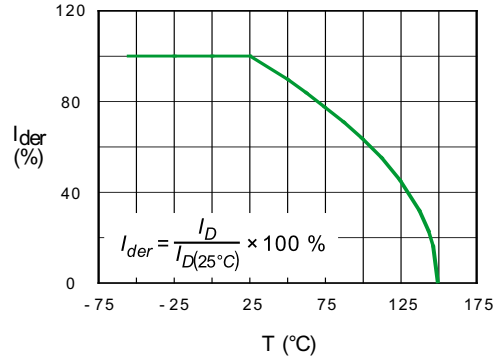


Fig.3: Safe operating area; junction to ambient; continuous and peak drain currents as a function of drain-source voltage

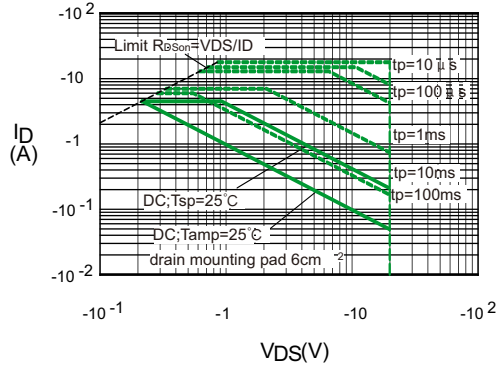


Fig.4: Transient thermal impedance from of pulse duration; junction to ambient as a function typical values

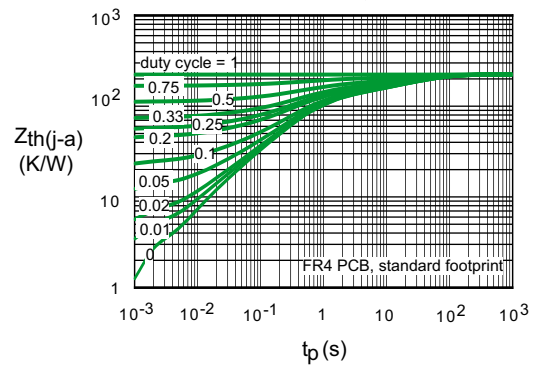


Fig.5: Transient thermal impedance from of pulse duration; typical values junction to ambient as a function

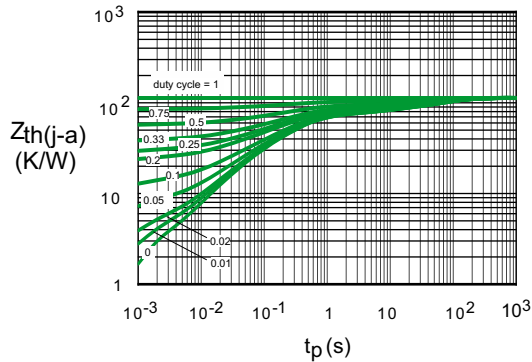


Fig.6: Output characteristics: drain current as a function of drain-source voltage; typical values

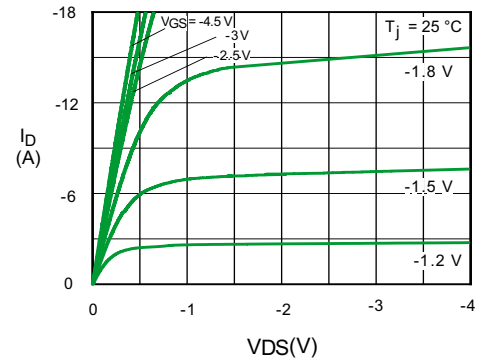


Fig.7: Sub-threshold drain current as a function of gate-source voltage

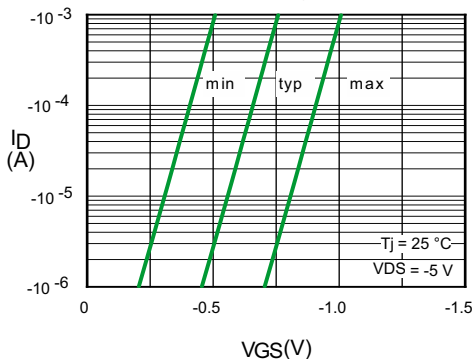


Fig.8: Drain-source on-state resistance as a function of drain current; typical values

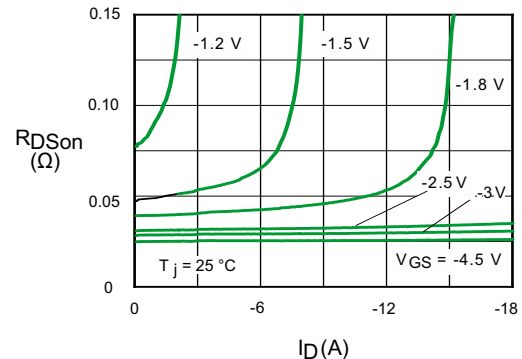




Fig.9: Drain-source on-state resistance as a function of gate-source voltage; typical values

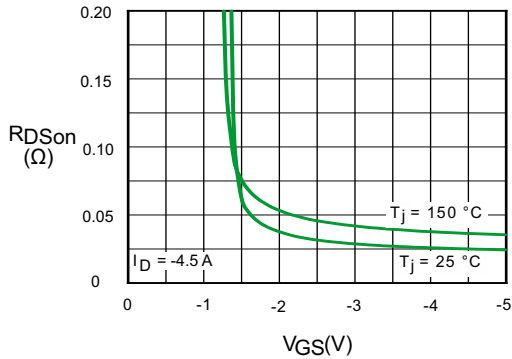


Fig.10: Transfer characteristics: drain current as a function of gate-source voltage; typical values

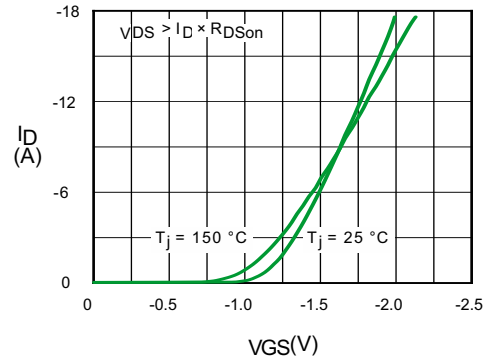


Fig.11: Normalized drain-source on-state resistance as a function of junction temperature; typical values

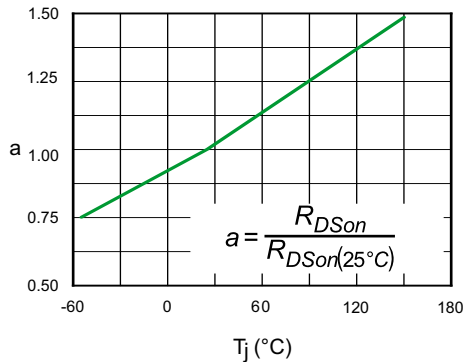


Fig.12: Gate-source threshold voltage as a function of junction temperature

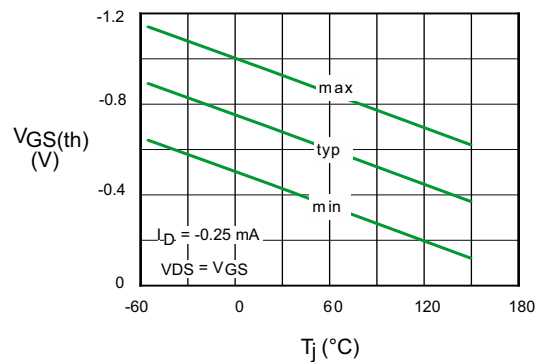


Fig.13: Input, output and reverse transfer capacitance as a function of drain-source voltage; typical values

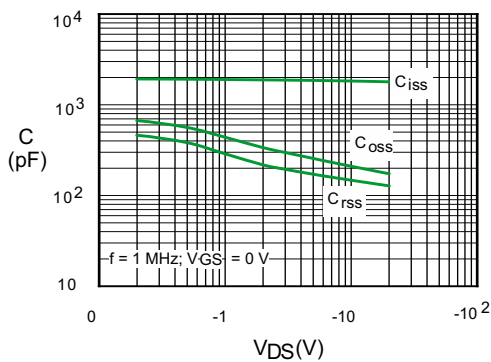


Fig.14: Gate-source voltage as a function of gate charge; typical values

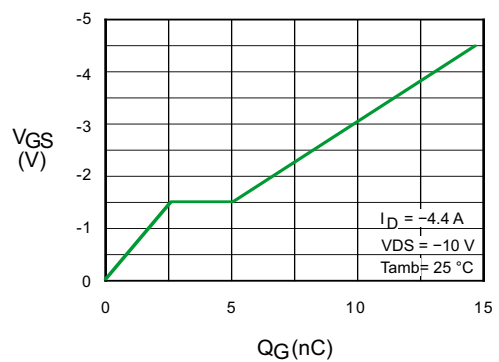
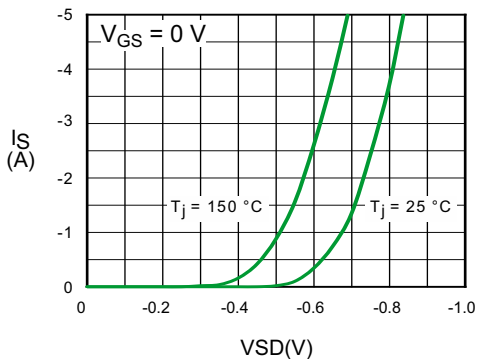
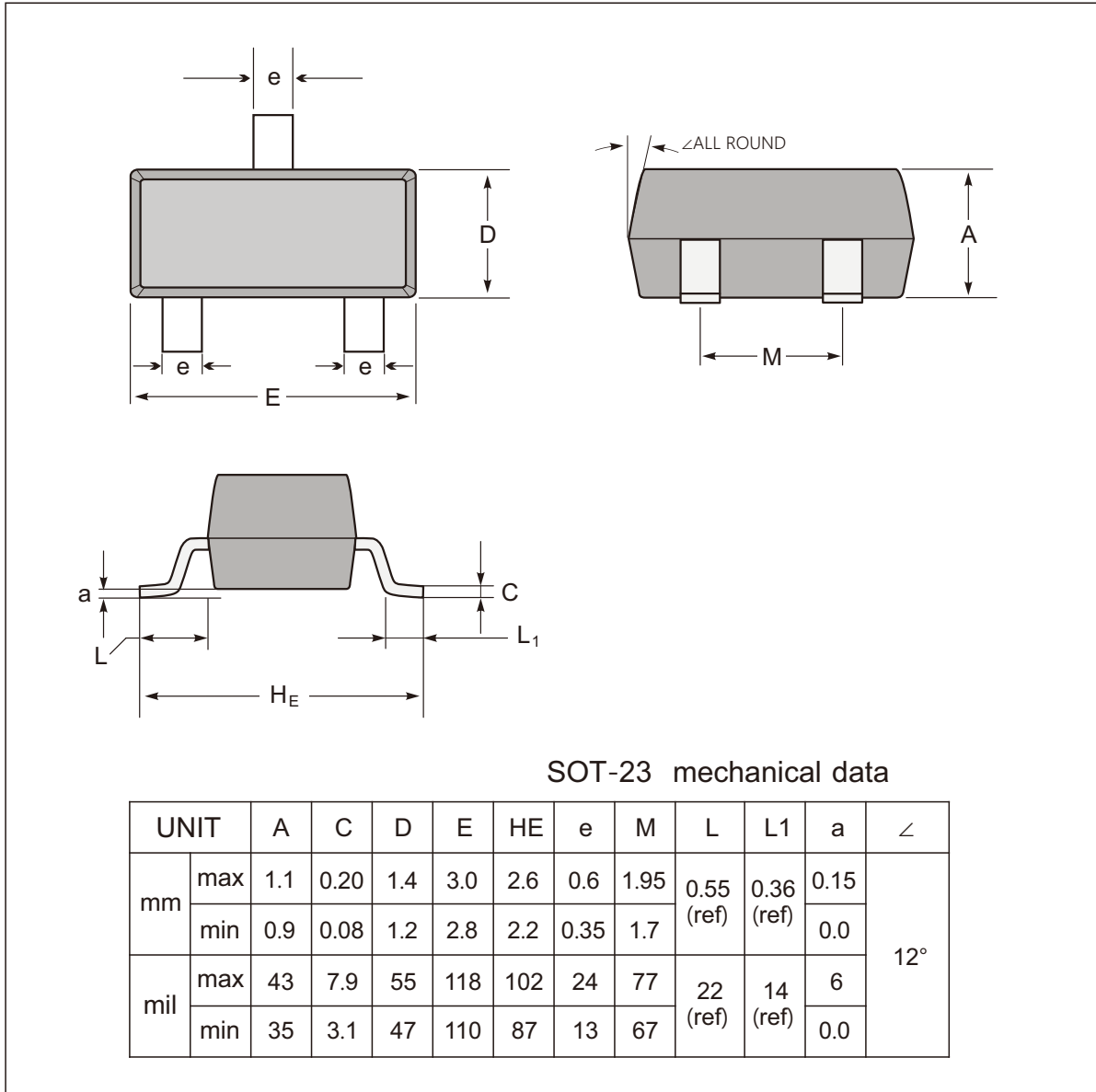


Fig.15: Source current as a function of source-drain voltage; typical values

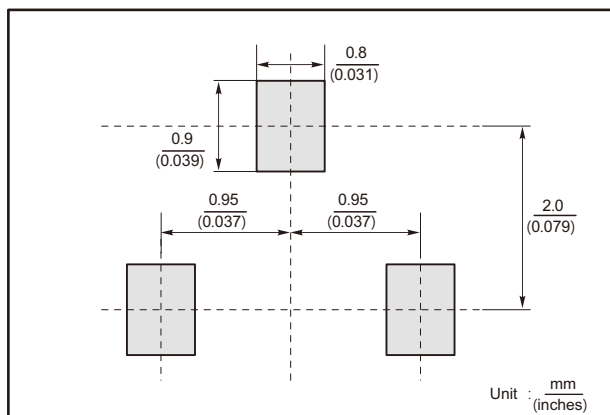




SOT-23 Package Outline Dimensions



The recommended mounting pad size



Marking

Type number	Marking code
PM5620EWD	5620



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