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TPMDPB55XP

DUAL P-CHANNEL ENHANCEMENT MODE MOSFET

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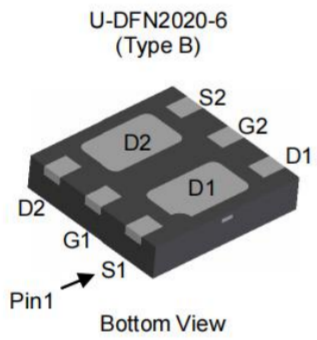
Product Summary

- V_{DS} -20 V
- I_{DS} (at V_{GS}=-4.5V) -4.2 A
- $R_{DS(ON)}$ (at V_{GS}=-4.5V) <58mΩ(TYP)

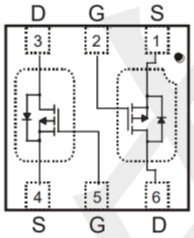
Application

- Reverse Battery protection
- Load switch
- Power management
- Motor Control
- Portable Power Adaptors

Package and Pin Configuration

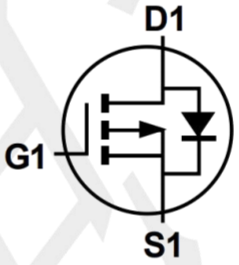


Bottom View

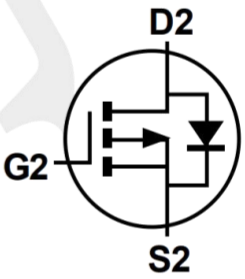


Top View
Internal Schematic

Circuit diagram



Q1 P-CHANNEL



Q2 P-CHANNEL

Absolute Maximum Ratings (T_A=25℃unless otherwise noted)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	-20	V
Gate-Source Voltage			V_{GSS}	±12	V
Continuous Drain Current N-Channel: VGS = 4.5V P-Channel: VGS = -4.5V	Steady State	TA=25℃	I_D	-4.2	A
		TA=70℃		-3.2	A
Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%)			I_{DM}	-16	A

Thermal Characteristic

PARAMETER	Symbol	Value	Unit
Total Power Dissipation (Note 1)	P_D	1.36	W
Thermal Resistance, Junction to Ambient (Note 1)	$R_{\theta JA}$	92	°C/W
Thermal Resistance, Junction to Case (Note 1)	$R_{\theta JC}$	18	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes: 1. Device mounted on 1" × 1" FR-4 PCB with high coverage 2oz. Copper, single sided.

Electrical Characteristics (@ TA = +25°C, unless otherwise specified.)

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS (Note 2)						
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250μA	BVDSS	-20	-23	--	V
Zero Gate Voltage Drain Current TJ = +25°C	V_{DS}=-20V ,V_{GS}= 0V	I_{DSS}	--	--	-1	μA
Gate-Source Leakage	V_{DS}=0V, V_{GS}= ±12V	I_{GSS}	--	--	±100	nA
ON CHARACTERISTICS (Note 2)						
Gate Threshold Voltage	V_{DS} = V_{GS}, ID = -250μA	$V_{GS(TH)}$	-0.4	-0.7	-1.0	V
Static Drain-Source On-Resistance	V_{GS}=-4.5V,I_D=-4.2A	R_{DS}(on)	--	58	85	mΩ
	V_{GS}=-2.5V,I_D=-2.9A		--	65	100	
Diode Forward Voltage	V_{GS} = 0V, IS = -4.2A	VSD	--	-0.7	-1.2	V
DYNAMIC CHARACTERISTICS (Note 3)						
Input Capacitance	V_{DS} = -15V, V_{GS} = 0V, f = 1.0MHz	C_{iss}	--	540	--	pF
Output Capacitance		C_{oss}	--	150	--	
Reverse Transfer Capacitance		C_{rss}	--	75	--	
Total Gate Charge (V_{GS} = -4.5V)	VDS = -10V, ID =-4.2A	Q_g	--	12	--	nC
Total Gate Charge (V_{GS} = -2.5V)			--	10	--	
Gate-Source Charge		Q_{gs}	--	2.4	--	
Gate-Drain Charge		Q_{gd}	--	3.2	--	
Turn-On Delay Time	VDD = -10V, VGS =- 4.2V, I_D=-1A, RG = 1Ω	$t_{D(ON)}$	--	8	--	nS
Turn-On Delay Time		t_R	--	14	--	
Turn-Off Delay Time		$t_{D(OFF)}$	--	18	--	
Turn-Off Fall Time		t_F	--	10	--	
Body Diode Reverse Recovery Time	Is = -4.2A, dI/dt =100A/μs	t_{RR}	--	7.6	--	
Body Diode Reverse Recovery Charge	Is = -4.2A, dI/dt =100A/μs	Q_{RR}	--	0.9	--	nC

Notes: 2. Short duration pulse test used to minimize self-heating effect.
3. Guaranteed by design. Not subject to product testing.

Typical Performance Characteristics(TA=25°C unless otherwise Specified)

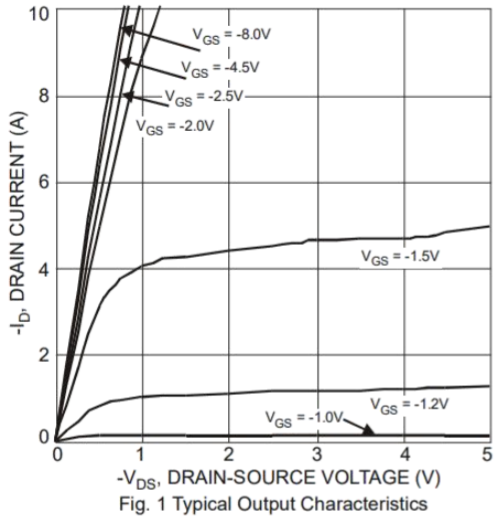


Fig. 1 Typical Output Characteristics

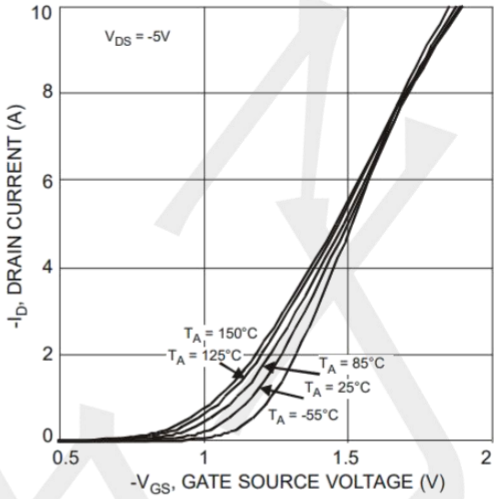


Fig. 2 Typical Transfer Characteristics

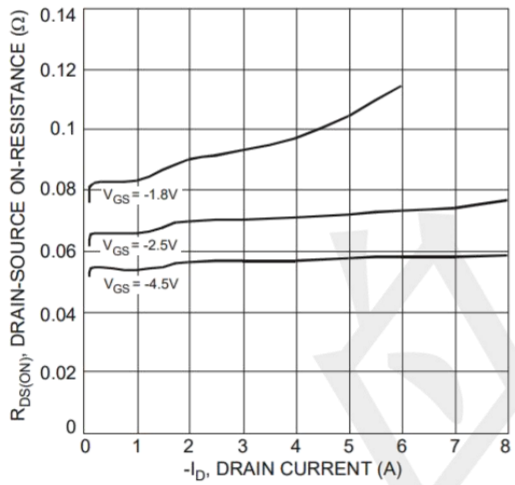


Fig. 3 Typical On-Resistance
vs. Drain Current and Gate Voltage

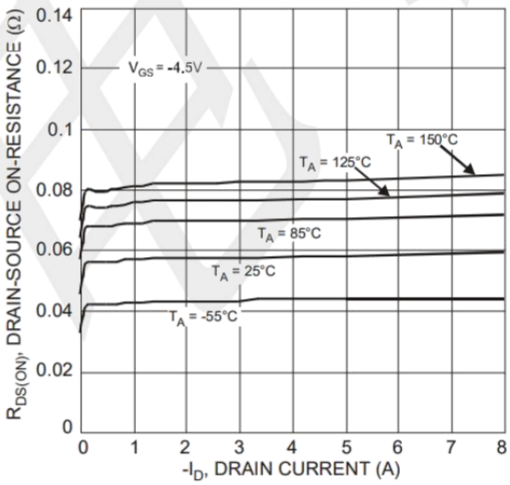


Fig. 4 Typical Drain-Source On-Resistance
vs. Drain Current and Temperature

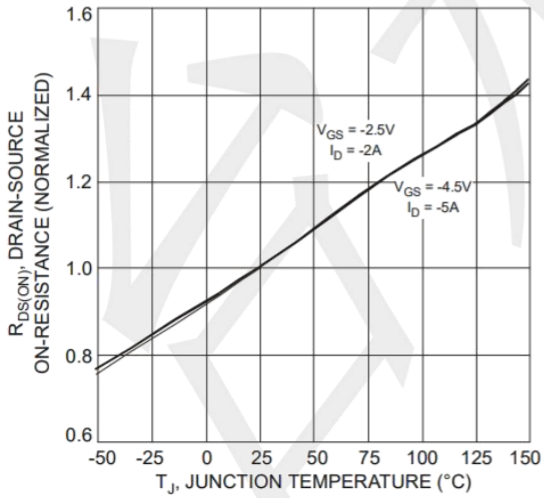


Fig. 5 On-Resistance Variation with Temperature

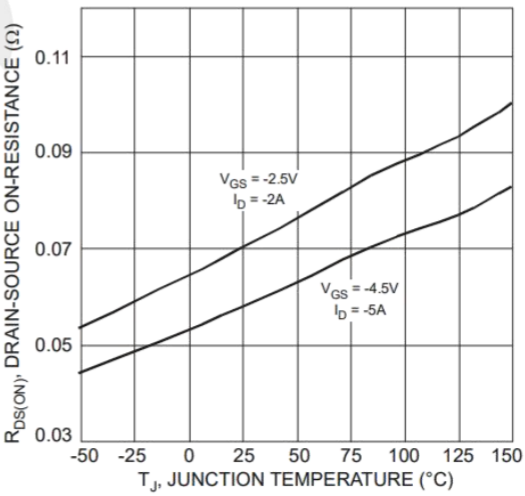
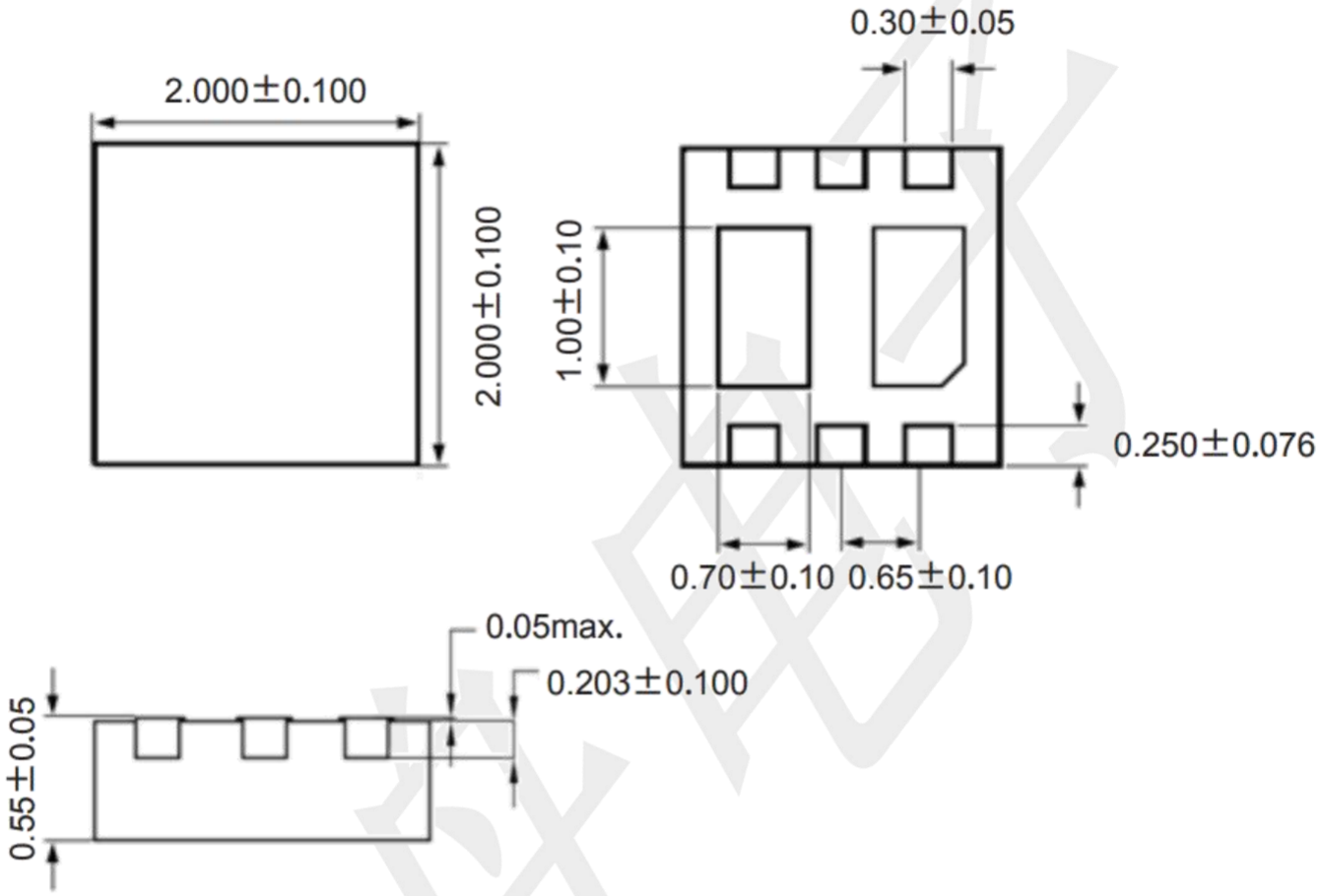


Fig. 6 On-Resistance Variation with Temperature

Package Outline Dimensions (unit: mm)

DFN2020-6



Mounting Pad Layout (unit: mm)