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TPM20PB12D8
Dual P-Channel MOSFET

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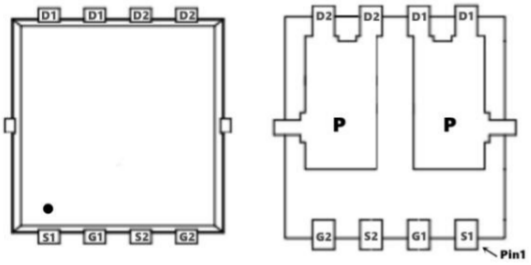
Product Summary

- V_{DS} -20 V
- I_{DS} (at V_{GS}=-4.5V) -12A
- $R_{DS\ (ON)}$ (at V_{GS}=-4.5V) ≤12mΩ (Typ)

Application

- Reverse Battery protection
- Load switch
- Power management
- PWM Application

Package and Pin Configuration



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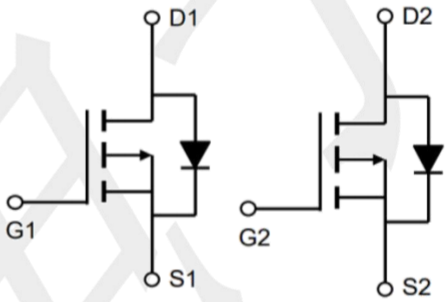
Circuit diagram



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

PARAMETER		SYMBOL	LIMIT	UNIT
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	±10	V
Continuous Drain Current	T_C=25℃	I_D	-12	A
	T_C=100℃		-10	
Pulsed Drain Current		I_{DM}	-50	A
Total Power Dissipation	T_C=25℃	P_{DTOT}	15	W
Operating Junction Temperature Range		T_J	-55 to +150	℃
Storage Temperature Range		T_{stg}	-55 to +150	℃

Thermal Characteristic

PARAMETER		Symbol	Value	Unit
Junction-to-Ambient Thermal Resistance	PCB Mount (Note)	$R_{\theta JA}$	8.4	°C/W

Note : The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.

Electrical Characteristics (T_A=25℃unless otherwise noted)

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
Static						
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250μA	BV_{DSS}	-20	--	--	V
Gate-Source Threshold Voltage	V_{DS}=V_{GS},I_D=-250μA	$V_{GS(th)}$	-0.4	-0.62	-1.0	V
Gate-Source Leakage	V_{DS}=0V, V_{GS}= ±10V	I_{GSS}	--	--	±100	nA
Zero Gate Voltage Drain Current	V_{DS}= -12V, V_{GS}=0V	I_{DSS}	--	-0.1	-1.0	μA
	V_{DS}=-12V, T_J=55°C		--	-1.0	-5.0	μA
Drain-Source On-State Resistance (Note 1)	V_{GS}=-4.5V, I_D= -6A	R_{DS}(on)	--	12	17	mΩ
	V_{GS}=-2.5V, I_D= -5A		--	15	21	
	V_{GS}=-1.8V, I_D= -3A		--	20	30	
Dynamic (Note 2)						
Total Gate Charge (Note 3)	V_{DS} = -6V,	Q_g	--	20	--	nC
Gate-Source Charge (Note 3)	I_D = -6A,	Q_{gs}	--	4.2	--	
Gate-Drain Charge (Note 3)	V_{GS} = -4.5V	Q_{gd}	--	5.2	--	
Input Capacitance	V_{DS} = -6,	C_{iss}	--	1750	--	pF
Output Capacitance	V_{GS} = 0V,	C_{oss}	--	320	--	
Reverse Transfer Capacitance	F= 1.0MHz	C_{rss}	--	220	--	
Switching						
Turn-On Delay Time (Note 3)	V_{DD} = -6V,	$t_{d(on)}$	--	20	--	nS
Rise Time (Note 3)	I_D= -1A,	t_r	--	36	--	
Turn-Off Delay Time (Note 3)	V_{GS} = -4.5V,	$t_{d(off)}$	--	90	--	
Fall Time (Note 3)	R_G = 6Ω	t_f	--	70	--	
Source-Drain Diode Ratings and Characteristics (Note 2)						
Forward Voltage	V_{GS} = 0V, I_F = -1A	V_{SD}	--	-0.8	-1.2	V
Continuous Source Current	Integral reverse diode in the MOSFET	I_S	--	--	-12	A
Pulsed Current (Note 1)		I_{SM}	--	--	-50	A

Notes:

1. Pulse test; pulse width ≤ 300 μS, duty cycle ≤ 2%.
2. Guaranteed by design, not subject to production testing.
3. Independent of operating temperature

Typical Electrical and Thermal Characteristics

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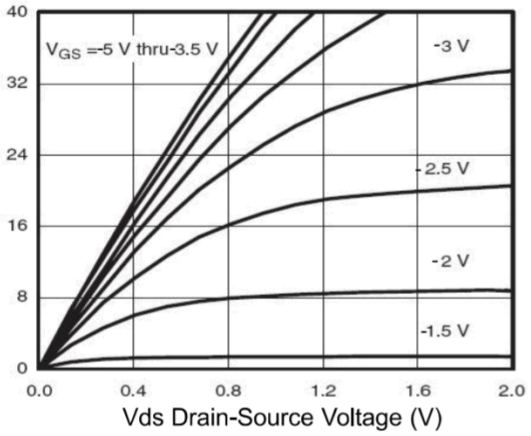
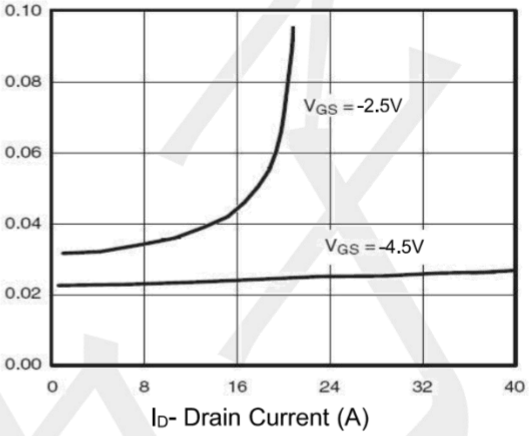
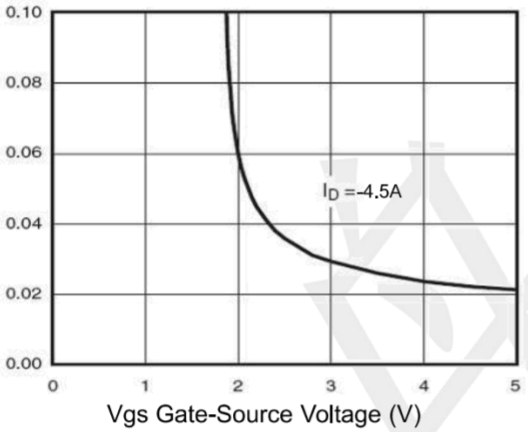


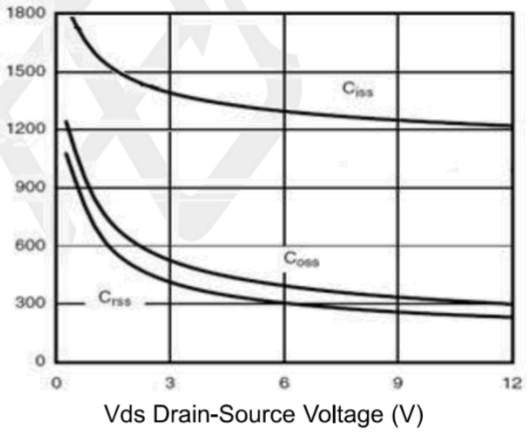
Drain Current



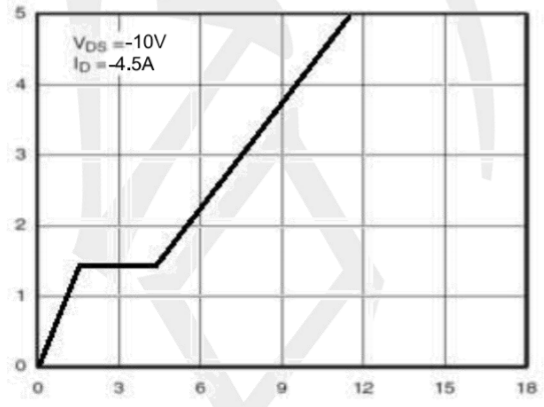
Transfer Characteristics



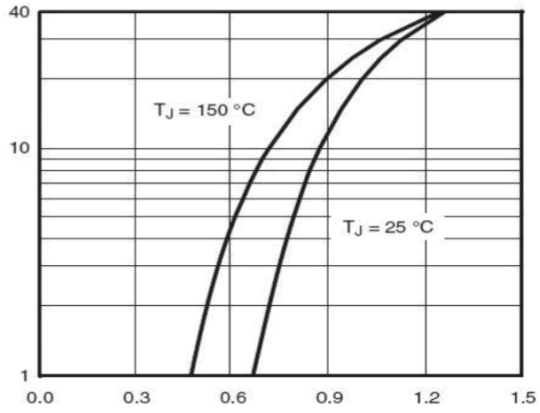
Drain-Source On-Resistance



Rdson vs Vgs



Capacitance vs Vds



Package Information

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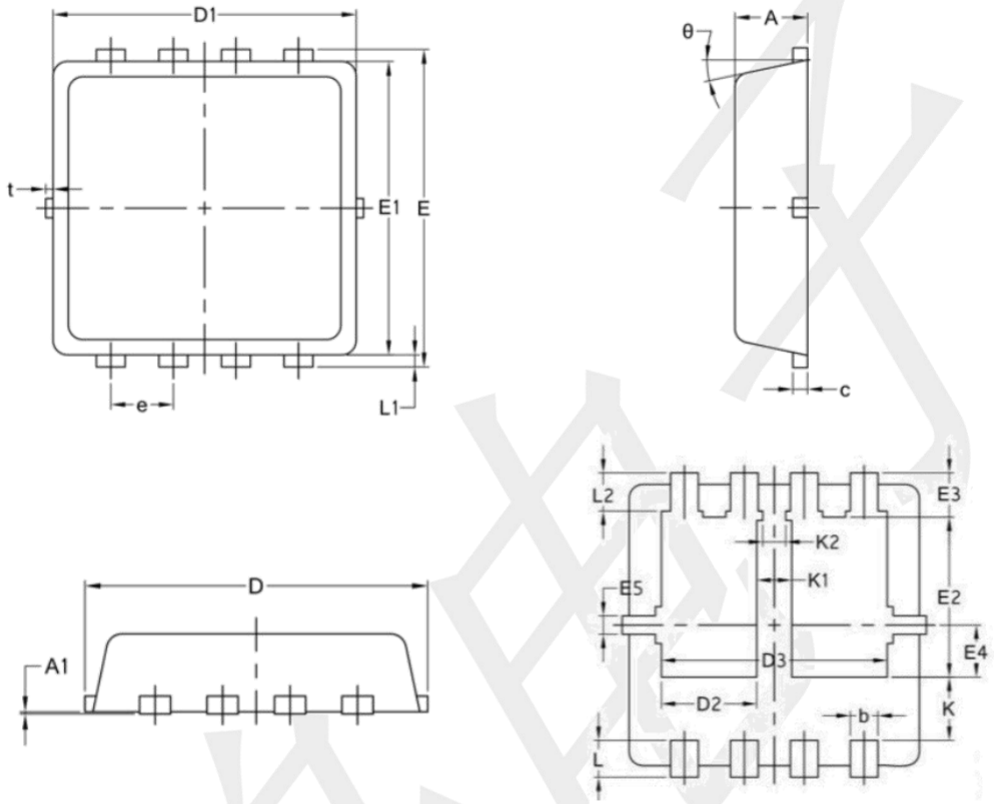

Symbol	Common		
	Mm		
	Min	Nom	Max
A	0.70	0.75	0.85
A1	/	/	0.05
b	0.25	0.30	0.39
c	0.14	0.152	0.20
D	3.20	3.30	3.45
D1	3.05	3.15	3.25
D2	0.84	1.04	1.24
D3	2.30	2.45	2.60
E	3.20	3.30	3.40
E1	2.95	3.05	3.15
E2	1.60	1.74	1.90
E3	0.28	0.48	0.65
E4	0.37	0.57	0.77
E5	0.10	0.20	0.30
e	0.60	0.65	0.70
K	0.50	0.69	0.80
K1	0.30	0.38	0.53
K2	0.15	0.25	0.35
L	0.30	0.40	0.50
L1	0.06	0.125	0.20
L2	0.27	0.42	0.57
t	0	0.075	0.13
Φ	10°	12°	14°