TECH PUBLIC
台舟电子

TPM4614BS8

COMPLEMENTARY PAIR ENHANCEMENT MODE MOSFET

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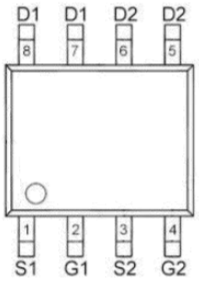
Application

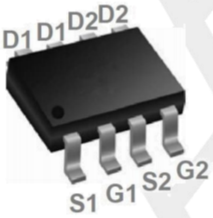
- Reverse Battery protection
- Load switch
- Power management
- Motor Control
- Portable Power Adaptors

Product Summary

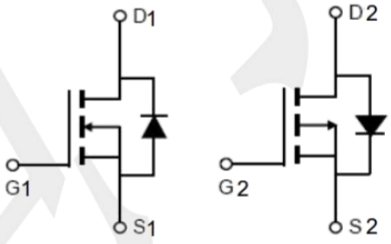
Device	BV_{DSS}	$R_{DS(ON)MAX}$	I_D MAX TA=25℃
Q1 N-Channel	40V	26mΩ@ VGS=10V	7.2A
		35mΩ@VGS=4.5V	5.2A
Q2 P-Channel	-40V	38mΩ@VGS=10V	-7.5A
		58mΩ@VGS=4.5V	-5.5A

Package and Pin Configuration





Circuit diagram



Schematic diagram

Marking:



Absolute Maximum Ratings

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

Characteristic			Symbol	Q1 N-CHANNEL	Q2 P-CHANNEL	Unit
Drain-Source Voltage			VDSS	40	-40	V
Gate-Source Voltage			V_{GSS}	±20	±20	V
Continuous Drain Current N-Channel: VGS = 10V P-Channel: VGS = -10V	Steady State	TA=25℃	I_D	7.2	-7.5	A
		TA=70℃		6.2	-6.5	A
Maximum Continuous Body Diode Forward Current (Note 1)			IS	5	-5.5	A
Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%)			IDM	30	-32	A

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

Thermal Characteristic

PARAMETER	Symbol	Value	Unit
Total Power Dissipation (Note 1)	P_D	2	W
Thermal Resistance, Junction to Ambient (Note 1)	$R_{\theta JA}$	62.5	°C/W
Thermal Resistance, Junction to Case (Note 1)	$R_{\theta JC}$	15	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics Q1 N-CHANNEL

(@ 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	40	--	--	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}= ±8V	I_{GSS}	--	--	±100	nA
ON CHARACTERISTICS (Note 2)						
Gate Threshold Voltage	V_{DS} = V_{GS}, ID = 250μA	$V_{GS(TH)}$	0.65	--	2.5	V
Static Drain-Source On-Resistance	V_{GS}=10V,I_D=7.2A	R_{DS}(on)	--	24	26	mΩ
	V_{GS}=4.5V,I_D=5A		--	32	35	
Diode Forward Voltage	V_{GS} = 0V, IS = 5A	VSD	--	0.7	1.2	V
DYNAMIC CHARACTERISTICS (Note 3)						
Input Capacitance	V_{DS} = 10V,	C_{iss}	--	700	--	pF
Output Capacitance	V_{GS} = 0V,	C_{oss}	--	92	--	
Reverse Transfer Capacitance	f = 1.0MHz	C_{rss}	--	80	--	
Total Gate Charge (V_{GS} = 4.5V)	VDS = 10V, ID =5A	Q_g	--	9.4	--	nC
Total Gate Charge (VGS = 10V)			--	18	--	
Gate-Source Charge		Q_{gs}	--	0.6	--	
Gate-Drain Charge		Q_{gd}	--	2	--	
Turn-On Delay Time	VDD = 10V, VGS = 4.5V,	$t_{D(ON)}$	--	5	--	nS
Turn-On Delay Time	I_D=1A, RG = 1Ω	t_R	--	14.4	--	
Turn-Off Delay Time		$t_{D(OFF)}$	--	30	--	
Turn-Off Fall Time		t_F	--	9.2	--	
Body Diode Reverse Recovery Time	IS = 5A, dI/dt = 100A/μs	t_{RR}	--	7.6	--	
Body Diode Reverse Recovery Charge	IS = 5A, 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.

Electrical Characteristics Q2 P-CHANNEL

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

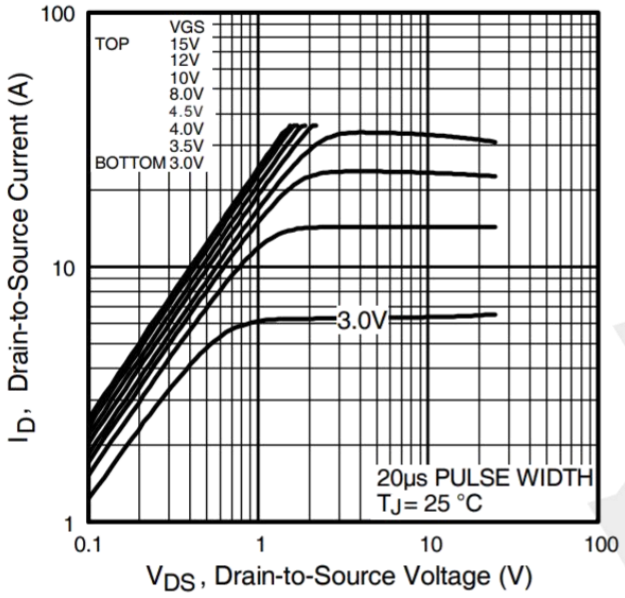
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS (Note 2)						
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250μA	BVDSS	-40	--	--	V
Zero Gate Voltage Drain Current TJ = +25°C	V_{DS}=-20V ,V_{GS}= 0V	I_{DSS}	--	--	-1	μA
Gate-Source Leakage	V_{DS}=0V, V_{GS}= ±8V	I_{GSS}	--	--	±100	nA
ON CHARACTERISTICS (Note 2)						
Gate Threshold Voltage	V_{DS} = V_{GS}, ID =- 250μA	$V_{GS(TH)}$	-0.65	--	-2.5	V
Static Drain-Source On-Resistance	V_{GS}=-10V,I_D=-7.5A	R_{DS}(on)	--	36	38	mΩ
	V_{GS}=-4.5V,I_D=-5A		--	55	58	
Diode Forward Voltage	V_{GS} = 0V, IS = -5A	VSD	--	-0.7	-1.2	V
DYNAMIC CHARACTERISTICS (Note 3)						
Input Capacitance	V_{DS} = -10V,	Ciss	--	710	--	pF
Output Capacitance	V_{GS} = 0V,	Coss	--	94	--	
Reverse Transfer Capacitance	f = 1.0MHz	Crss	--	85	--	
Total Gate Charge (V_{GS} =-4.5V)	VDS = -10V, ID =-5A	Qg	--	9.6	--	nC
Total Gate Charge (VGS = -10V)			--	19	--	
Gate-Source Charge		Qgs	--	0.8	--	
Gate-Drain Charge		Qgd	--	2.5	--	
Turn-On Delay Time	VDD = -10V,	$t_{D(ON)}$	--	5.6	--	nS
Turn-On Delay Time	VGS = -4.5V,	t_R	--	14.8	--	
Turn-Off Delay Time	I_D=-1A, RG = 1Ω	$t_{D(OFF)}$	--	35	--	
Turn-Off Fall Time		t_F	--	9.8	--	
Body Diode Reverse Recovery Time	IS = -5A, dI/dt = 100A/μs	t_{RR}	--	7.9	--	
Body Diode Reverse Recovery Charge	IS = -5A, dI/dt = 100A/μs	QRR	--	1.1	--	nC

Notes: 2. Short duration pulse test used to minimize self-heating effect.

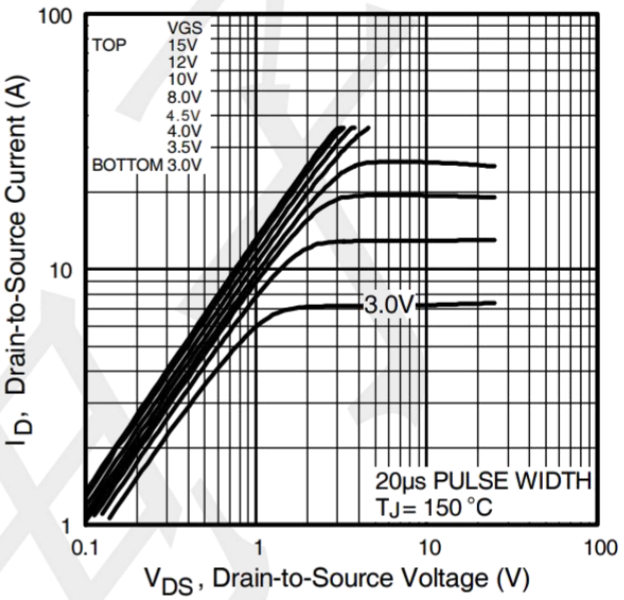
3. Guaranteed by design. Not subject to product testing.

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

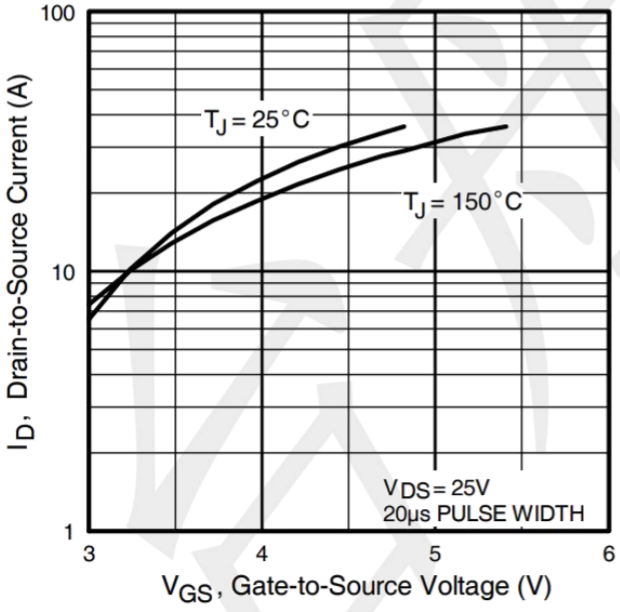
Q1 N-CHANNEL



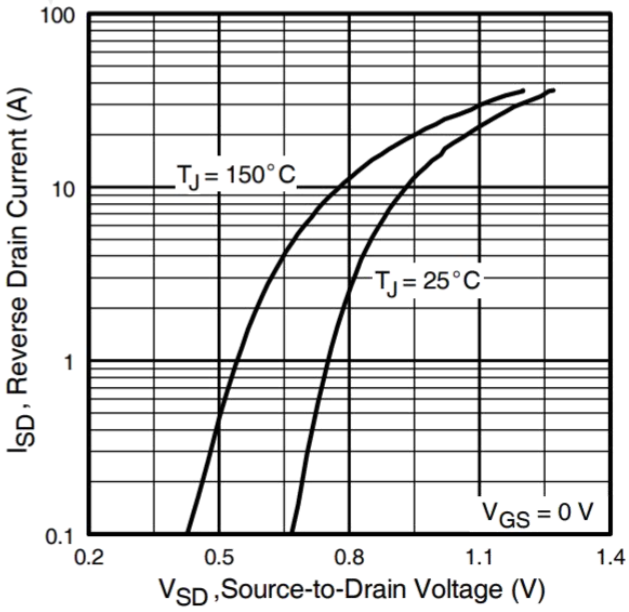
Typical Output Characteristics



Typical Output Characteristics



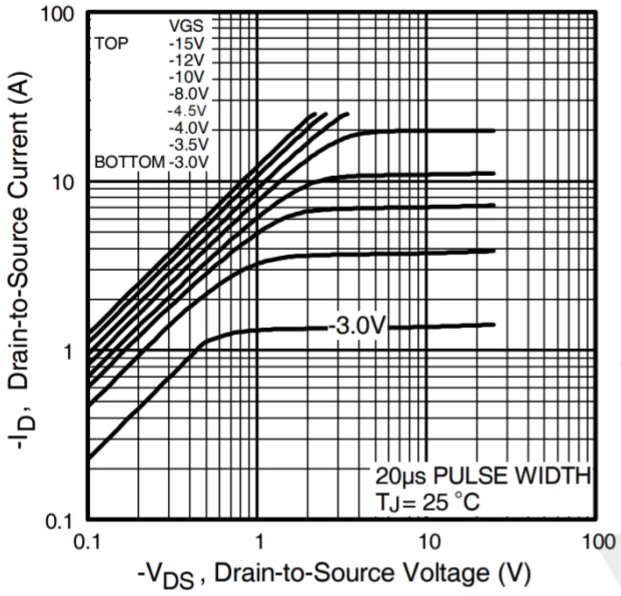
Typical Transfer Characteristics



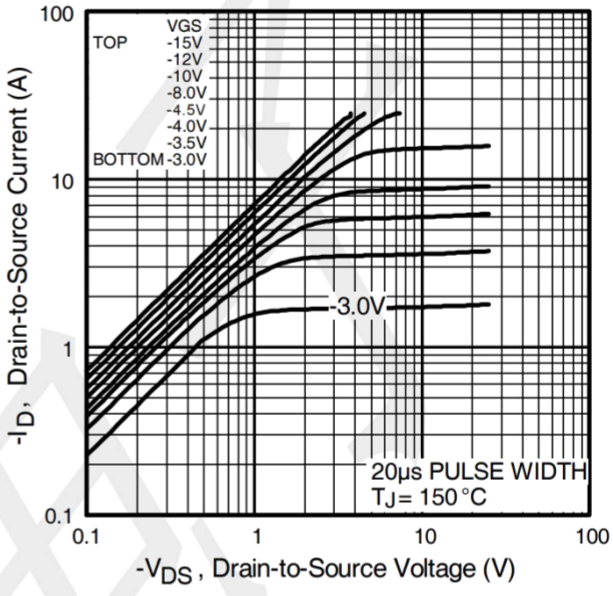
Typical Source-Drain Diode Forward Voltage

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

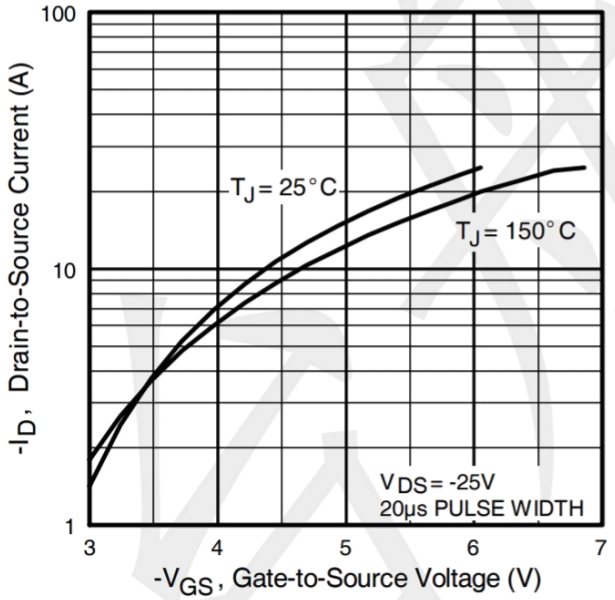
Q2 P-CHANNEL



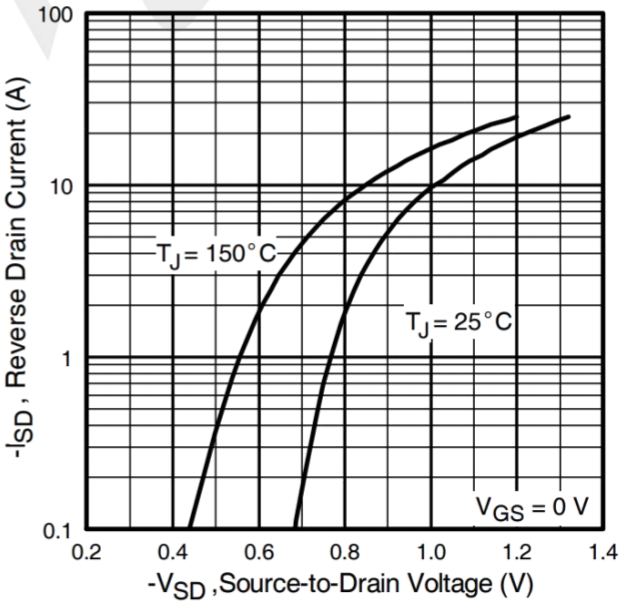
Typical Output Characteristics



Typical Output Characteristics



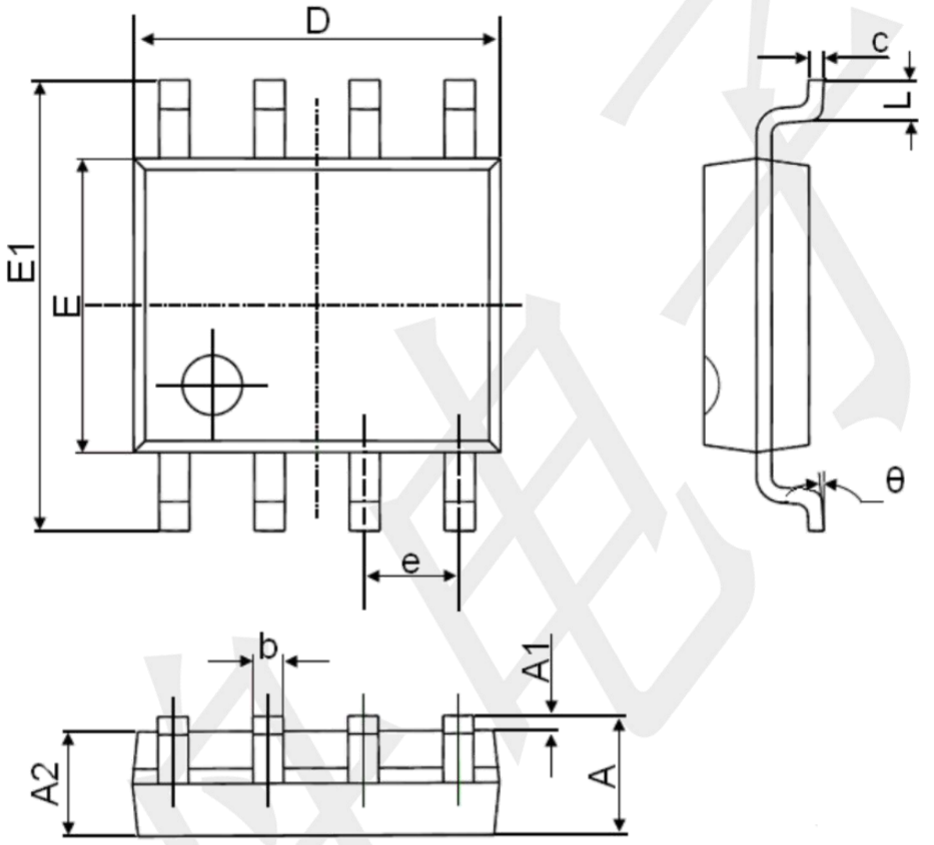
Typical Transfer Characteristics



Typical Source-Drain Diode Forward Voltage

Package Outline Dimensions (Unit: mm)

SOP8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°