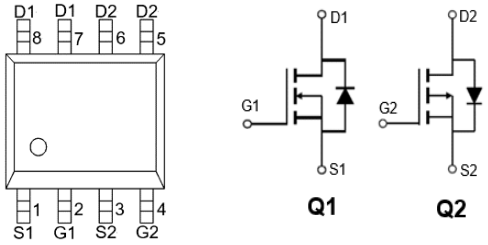
N and P-Channel Enhancement Mode MOSFET

Features

- High Speed Power Switching Logic Level
- Enhanced Body diode dv/dt capability
- Enhanced Avalanche Ruggedness
- 100% UIS Tested, 100% Rg Tested
- Lead Free, Halogen Free
- Application
- Synchronous Rectification in SMPS
- Hard Switching and High Speed Circuit
- DC/DC in Telecoms and Inductria

BVDSS	RDSON	ID
40V	34mΩ	10A
-40V	54 mΩ	-7A

SOP8



Ordering Information

Device	package	Device Marking	Package Qty.
JMTP170C04D	SOP-8	TP170C04D	3000/PCS

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

Parameter	Symbol	Value(Q1)	Value(Q2)	Unit
Drain-Source Voltage (V_{GS}=0V)	V_{DS}	40	-40	V
Gate-Source Voltage (V_{GS}=0V,static)	V_{GS}	±20	±20	V
Continuous Drain Current (T_C=25℃)	I_D	10	-7	A
Continuous Drain Current (T_C=100℃)		7	-5	A
Pulesd Drain Current	I_{DM}	48	-40	A
Single Pulsed Avalanche Energy	E_{AS}	15	21	mJ
Maximum Power Dissipation (T_C =25℃)	P_D	4	4.5	W
Operating,Storage Temperature Range	T_J,T_{STG}	-55~150	-55~150	℃

Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	14	-	℃/ W
Thermal Resistance,Junction-to-Ambient	$R_{\theta JA}$	63	-	℃/ W

Q1:Electrical Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=250μA	40	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=40V, V_{GS}=0V	-	-	1	μA
Gate -Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS},I_D=250μA	1.1	1.5	1.9	V
Drain-Source On-stage Resistance	$R_{DS(ON)}$	V_{GS}=10V,I_D=1A	-	28	34	mΩ
		V_{GS}=4.5V,I_D=1A	-	32	40	

Dynamic Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Input capacitance	C_{iss}	V_{DS}=20V	-	556	-	pF
Output capacitance	C_{oss}	V_{GS}=0V	-	82	-	
Reverse transfer capacitance	C_{rss}	f=1MHz	-	76	-	
Gate Resistance	R_g	f=1MHz	-	3.9	-	Ω
Total Gate Charge	Q_g	V_{DS}=20V	-	10	-	nC
Gate Source Charge	Q_{gs}	V_{GS}=10V	-	3.2	-	
Gate Drain Charge	Q_{gd}	I_D=6A	-	2	-	
Turn-on delay Time	$t_{d(on)}$	V_{GS}=10V	-	5	-	ns
Rise time	t_r	V_{DS}=20V	-	3	-	
Turn-off delay Time	$t_{d(off)}$	R_L=3.2Ω	-	16	-	
Fall time	t_f	R_G=3Ω	-	6	-	

Reverse Diode Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Body Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_{SD}=1A	-	0.7	1	V
Reverse Recovery Time	t_{rr}	V_{GS}=0V,I_{SD}=6A	-	10	-	ns
Reverse Recovery Charge	Q_{rr}	d_i/d_t=500A/μs	-	13	-	nC

Q1:Electrical Characteristics Diagrames

Figure 1. On-Regin Characteristics

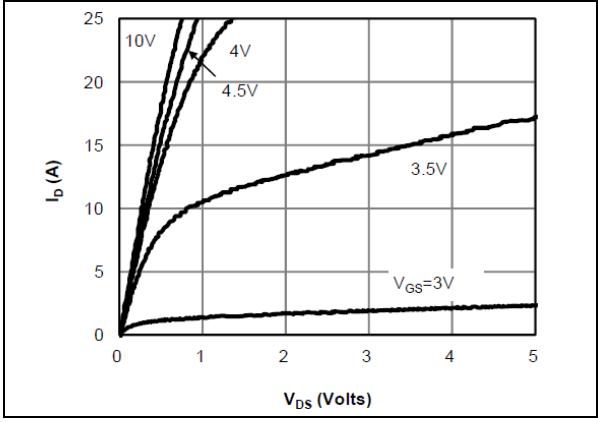


Figure 2. Transfer Characteristics

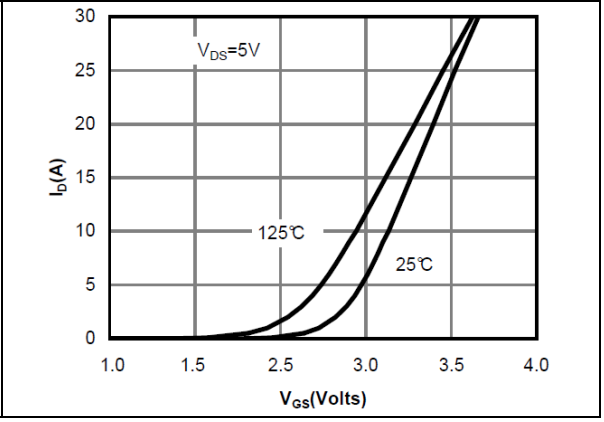


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

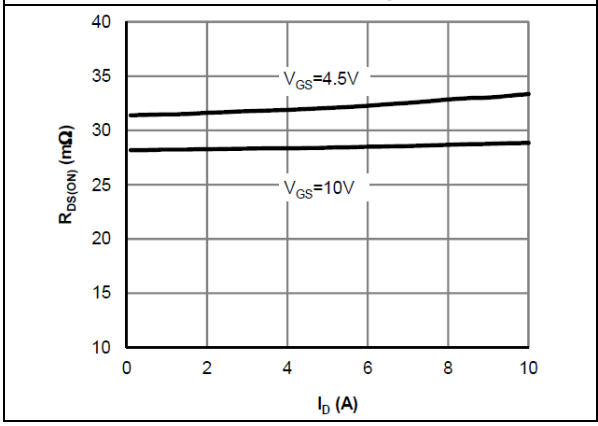


Figure 4. On-Resistance vs. Junction Temperature

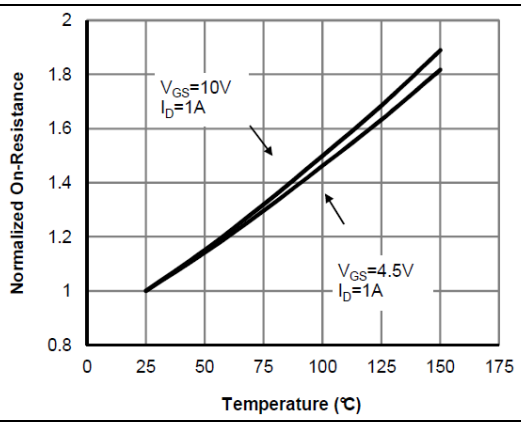


Figure 5. On-Resistance vs. Gate-Source Voltage

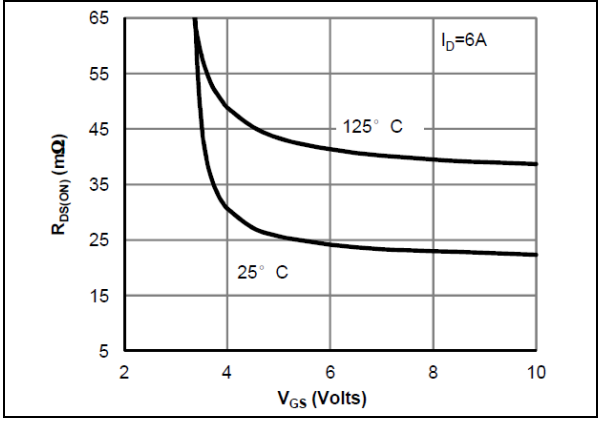
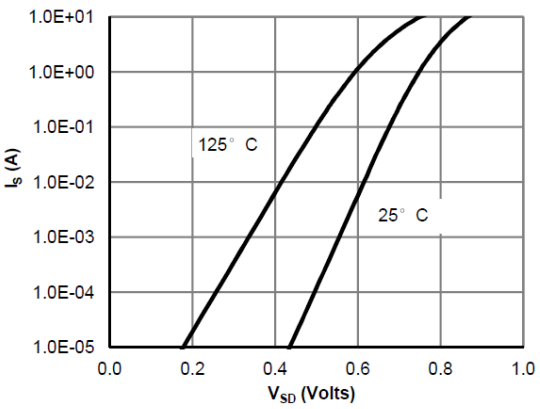


Figure 6. Body-Diode Characteristics



Q2:Electrical Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=-250μA	-40	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-40V, V_{GS}=0V	-	-	-1	μA
Gate -Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS},I_D=-250μA	-1.1	-1.5	-1.9	V
Drain-Source On-stage Resistance	$R_{DS(ON)}$	V_{GS}=-10V,I_D=-1A	-	42	54.5	mΩ
		V_{GS}=-4.5V,I_D=-1A	-	60	78	

Dynamic Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Input capacitance	C_{iss}	V_{DS}=-20V	-	980	-	pF
Output capacitance	C_{oss}	V_{GS}=0V	-	92	-	
Reverse transfer capacitance	C_{rss}	f=1MHz	-	75	-	
Gate Resistance	R_g	f=1MHz	-	8.9	-	Ω
Total Gate Charge	Q_g	V_{DS}=-20V	-	17	-	nC
Gate Source Charge	Q_{gs}	V_{GS}=-10V	-	3.5	-	
Gate Drain Charge	Q_{gd}	I_D=-5A	-	3	-	
Turn-on delay Time	$t_{d(on)}$	V_{GS}=-10V	-	6.5	-	ns
Rise time	t_r	V_{DS}=-20V	-	7.8	-	
Turn-off delay Time	$t_{d(off)}$	R_L=4Ω	-	45	-	
Fall time	t_f	R_G=3Ω	-	40	-	

Reverse Diode Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Body Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_{SD}=-1A	-	-0.7	-1	V
Reverse Recovery Time	t_{rr}	V_{GS}=0V,I_{SD}=-5A	-	22	-	ns
Reverse Recovery Charge	Q_{rr}	d_i/d_t=500A/μs	-	15	-	nC

Q2:Electrical Characteristics Diagrames

Figure 1. On-Regin Characteristics

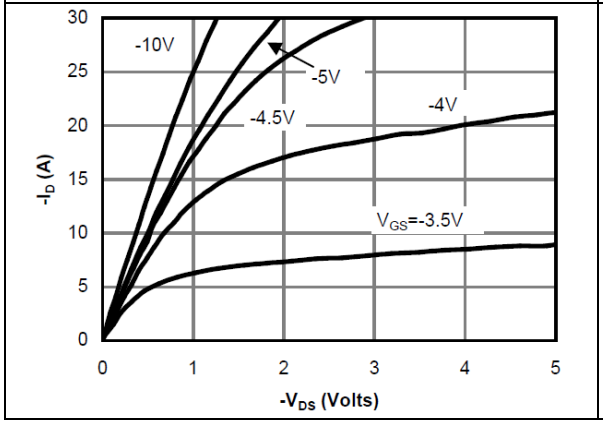


Figure 2. Transfer Characteristics

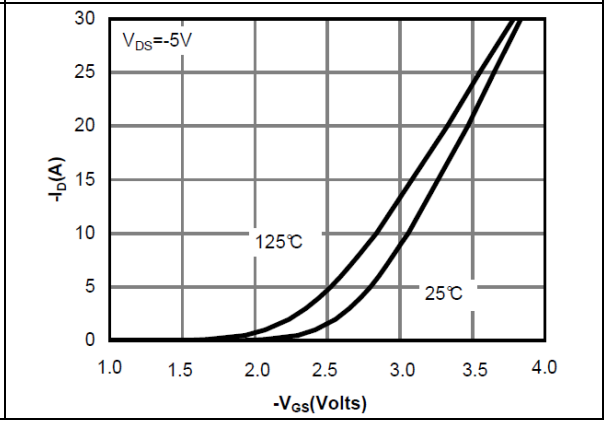


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

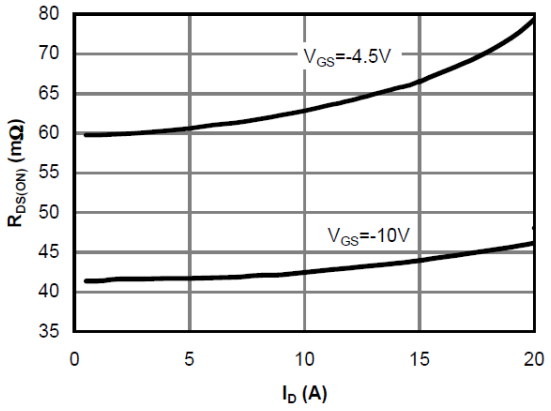


Figure 4. On-Resistance vs. Junction Temperature

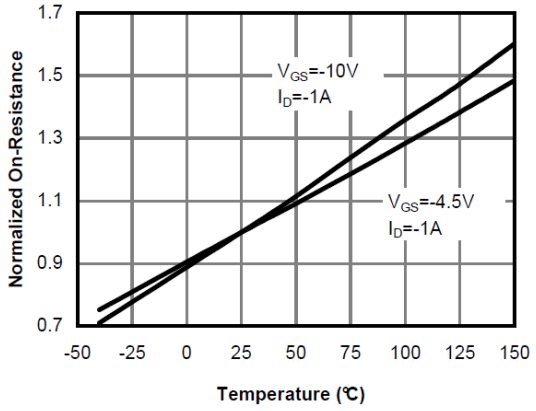


Figure 5. On-Resistance vs. Gate-Source Voltage

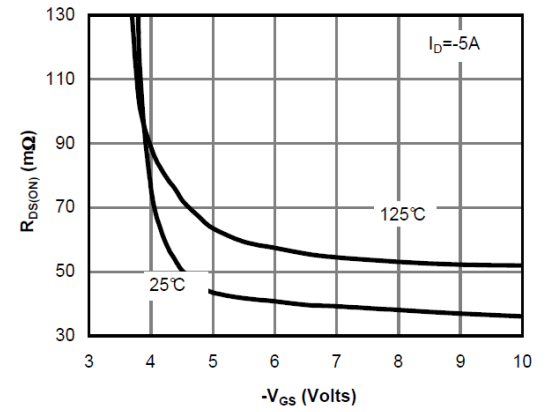


Figure 6. Body-Diode Characteristics