P-Channel Enhancement Mode MOSFET

Features

- Low Rdson for low conduction loss
- Reliable and Rugged
- ROHS Compliant & Halogen-Free

Applications

- Power Management in Desktop Computer
- DC/DC Converters

Pin Description

SOT23	Symbol

V_{DSS}	-100	V
$R_{DS(ON)-Typ}$	450	mΩ
I_D	-0.9	A

Absolute Maximum Ratings(T_A=25℃, Unless Otherwise Noted)

Symbol	Parameter		Rating	Unit
V_{DSS}	Drain-Source Voltage		-100	V
V_{GSS}	Gate-Source Voltage		±20	V
T_J	Maximum Junction Temperature		-55 to 150	℃
T_{STG}	Storage Temperature Range		-55 to 150	℃
I_{DM}[①]	Pulse Drain Current Tested		-3.6	A
I_D	Continuous Drain Current		-0.9	A
P_D	Maximum Power Dissipation	T_C=25℃	0.9	W

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$[③]	Thermal Resistance-Junction to Ambient (Max)	145	℃/W

Note ① : Max. current is limited by bonding wire.

Note ② : UIS tested and pulse width are limited by maximum junction temperature 150℃.

Note ③ : Surface Mounted on 1in² FR-4 board with 1oz.

P-Channel Enhancement Mode MOSFET

Electrical Characteristics (T$_J$=25℃, Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV$_{DSS}$	Drain-Source Breakdown Voltage	V$_{GS}$=0V, I$_D$=-250uA	-100	---	---	V
I$_{DSS}$	Zero Gate Voltage Drain Current	V$_{DS}$=-80V, V$_{GS}$=0V	---	---	-1	uA
V$_{GS(th)}$	Gate Threshold Voltage	V$_{DS}$=V$_{GS}$, I$_D$=-250uA	-1	---	-2.5	V
I$_{GSS}$	Gate Leakage Current	V$_{GS}$=±20V, V$_{DS}$=0V	---	---	±100	nA
R$_{DS(ON)}$	Drain-Source On-state Resistance	V$_{GS}$=-10V, I$_D$=-1A	---	450	600	mΩ
		V$_{GS}$=-4.5V, I$_D$=-0.5A	---	550	800	mΩ
gfs	Forward Transconductance	V$_{DS}$=-4.5V, I$_D$=-1A	---	---	---	S
Dynamic Characteristics[5]						
C$_{iss}$	Input Capacitance	V$_{GS}$=0V, V$_{DS}$=-50V, Freq.=1MHz	---	270	---	pF
C$_{oss}$	Output Capacitance		---	20	---	
C$_{rss}$	Reverse Transfer Capacitance		---	21	---	
T$_{d(on)}$	Turn-on Delay Time	V$_{DD}$=-50V , V$_{GS}$=-10V , R$_G$=6Ω, ID=1A	---	8.2	---	nS
T$_r$	Turn-on Rise Time		---	1.2	---	
T$_{d(off)}$	Turn-off Delay Time		---	21	---	
T$_f$	Turn-off Fall Time		---	1.8	---	
Q$_g$	Total Gate Charge	V$_{DS}$=-50V , V$_{GS}$=-10V , I$_D$=-1A	---	6.6	---	nC
Q$_{gs}$	Gate-Source Charge		---	1	---	
Q$_{gd}$	Gate-Drain Charge		---	1.5	---	
Source-Drain Characteristics （T$_J$=25℃）						
V$_{SD}$[4]	Diode Forward Voltage	V$_{GS}$=0V , I$_S$=-1A , T$_J$=25℃	---	---	-1.2	V
t$_{rr}$	Reverse Recovery Time	I$_F$=-1A ,di/dt=100A/μs	---	17	---	nS
Q$_{rr}$	Reverse Recovery Charge		---	12	---	nC
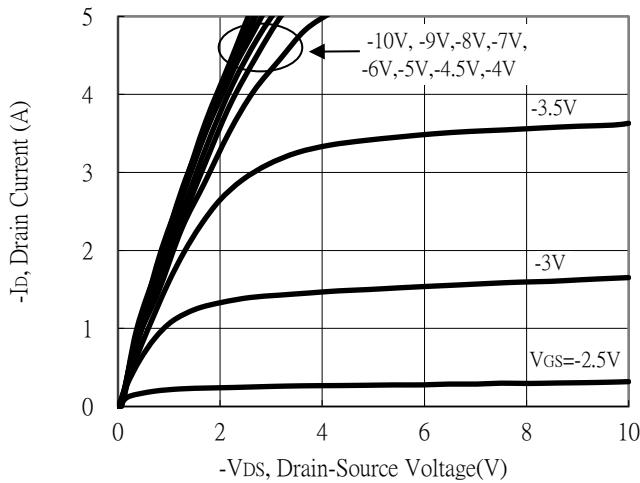
Note ④： Pulse test (pulse width≤300us, duty cycle≤2%).

Note ⑤：Guaranteed by design, not subject to production testing.
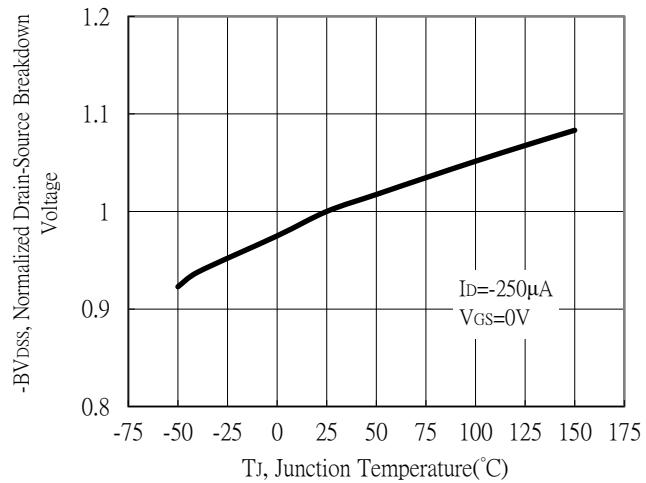
# P-Channel Enhancement Mode MOSFET

Typical Characteristics
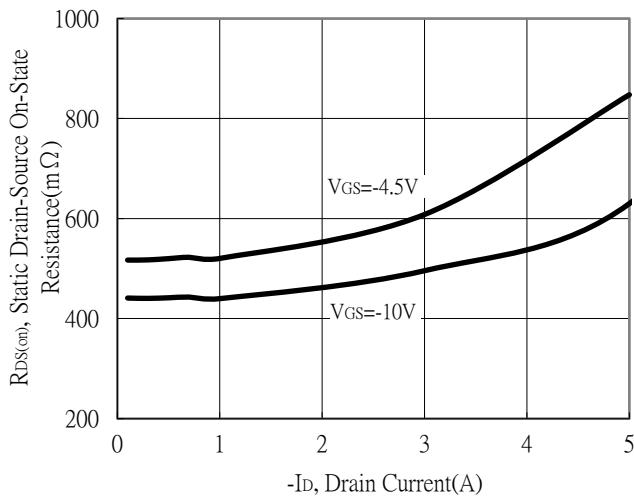
Typical Output Characteristics

-10V, -9V,-8V,-7V, -6V,-5V,-4.5V,-4V

-3.5V

-3V

V_{GS}=-2.5V

-I_D, Drain Current (A)

-V_{DS}, Drain-Source Voltage(V)
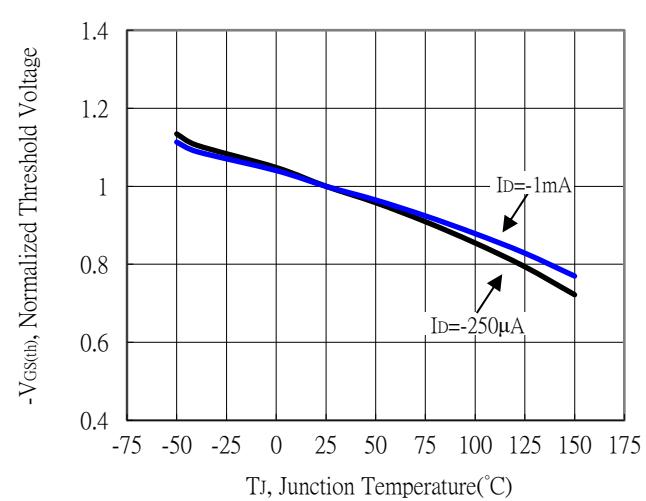
Breakdown Voltage vs Ambient Temperature

I_D=-250μA
V_{GS}=0V

-BV_{DSS}, Normalized Drain-Source Breakdown Voltage

T_J, Junction Temperature(°C)
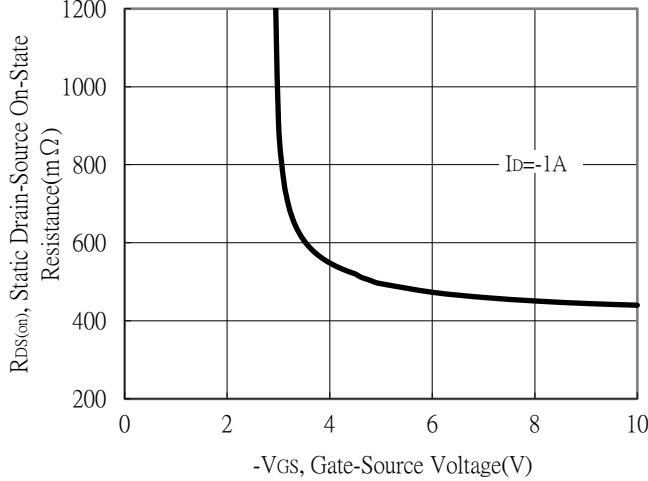
Static Drain-Source On-State resistance vs Drain Current

V_{GS}=-4.5V

V_{GS}=-10V

$R_{DS(on)}$, Static Drain-Source On-State Resistance(mΩ)
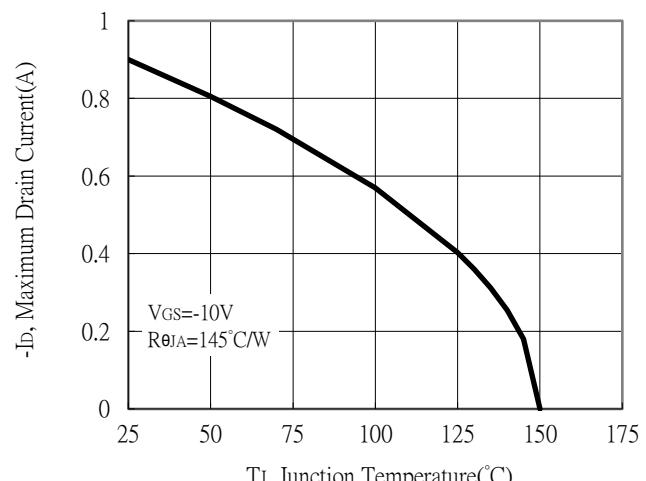
-I_D, Drain Current(A)

Threshold Voltage vs Junction Temperature

I_D=-1mA

I_D=-250μA

-$V_{GS(th)}$, Normalized Threshold Voltage

T_J, Junction Temperature(°C)
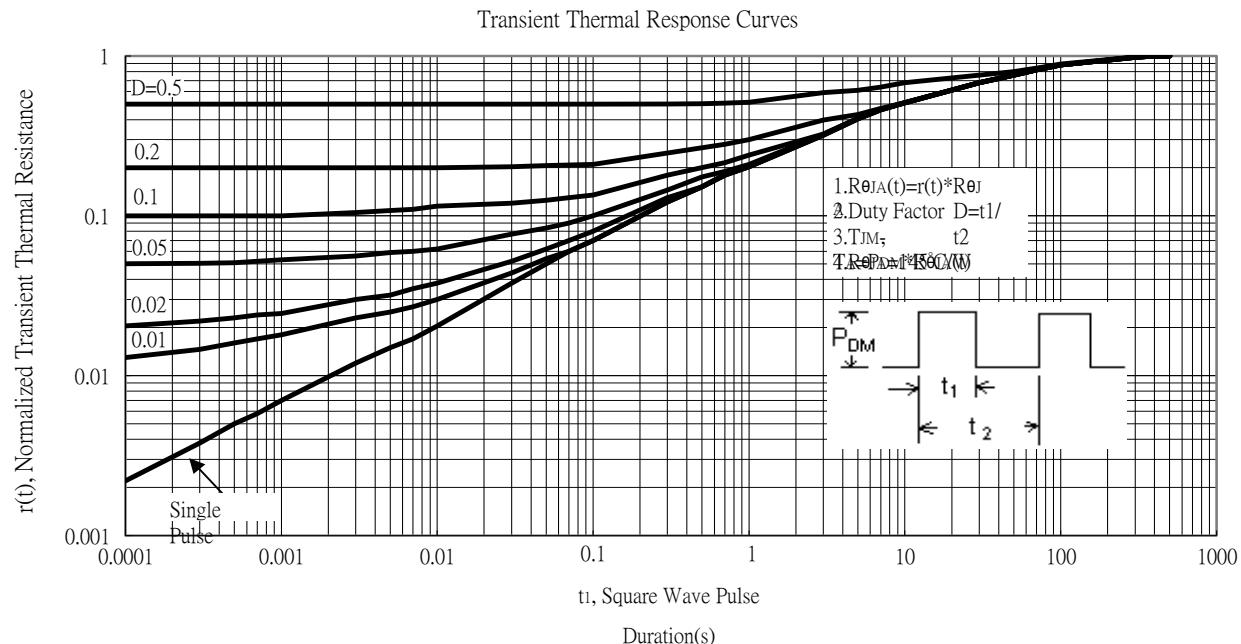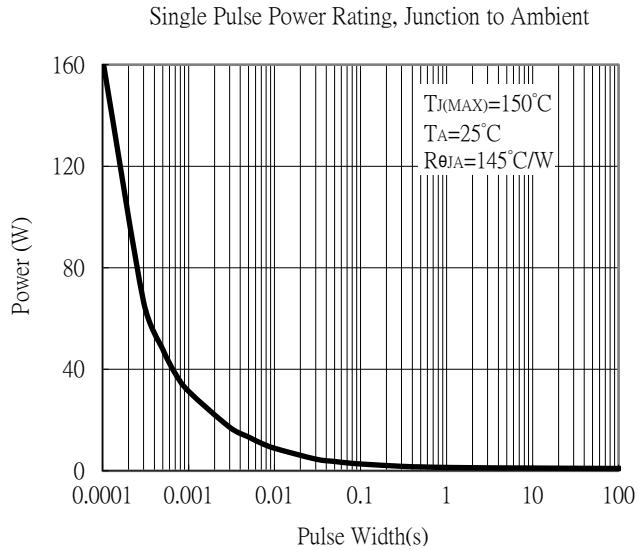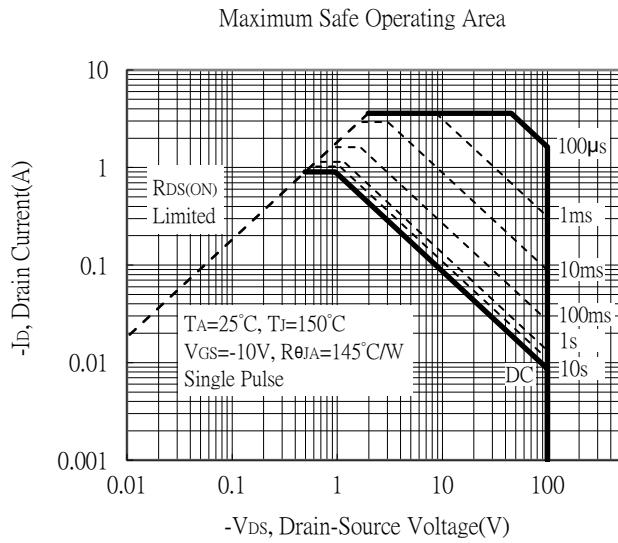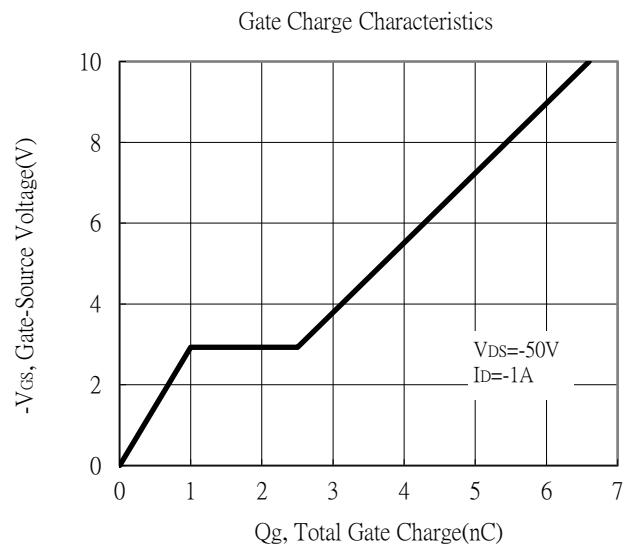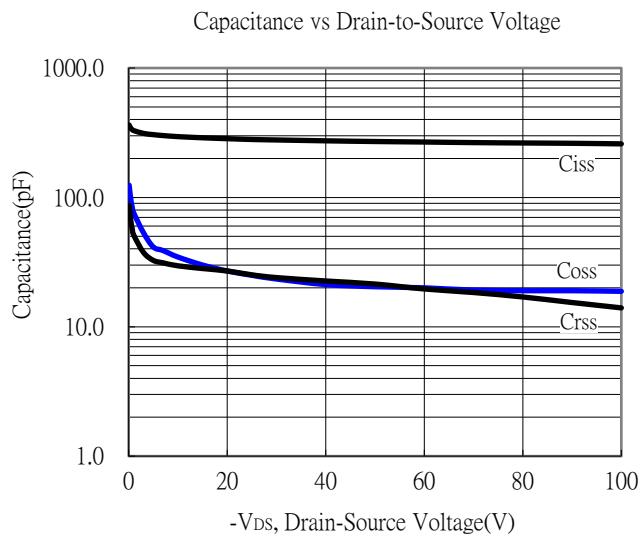
Static Drain-Source On-State Resistance vs Gate-Source Voltage

I_D=-1A

$R_{DS(on)}$, Static Drain-Source On-State Resistance(mΩ)

-V_{GS}, Gate-Source Voltage(V)

Maximum Drain Current vs Junction Temperature

V_{GS}=-10V
RθJA=145°C/W

-I_D, Maximum Drain Current(A)

T_J, Junction Temperature(°C)

P-Channel Enhancement Mode MOSFET

Capacitance vs Drain-to-Source Voltage

Capacitance vs Drain-to-Source Voltage chart. Y-axis: Capacitance(pF) from 1.0 to 1000.0. X-axis: -V$_{DS}$, Drain-Source Voltage(V) from 0 to 100. Curves labeled Ciss, Coss, Crss.

Gate Charge Characteristics

Gate Charge Characteristics chart. Y-axis: -V$_{GS}$, Gate-Source Voltage(V) from 0 to 10. X-axis: Qg, Total Gate Charge(nC) from 0 to 7. V$_{DS}$=-50V, I$_D$=-1A

Maximum Safe Operating Area

Maximum Safe Operating Area chart. Y-axis: -I$_D$, Drain Current(A) from 0.001 to 10. X-axis: -V$_{DS}$, Drain-Source Voltage(V) from 0.01 to 100. R$_{DS(ON)}$ Limited. T$_A$=25℃, T$_J$=150℃, V$_{GS}$=-10V, R$\theta$$_{JA}$=145℃/W, Single Pulse. Curves labeled 100μs, 1ms, 10ms, 100ms, 1s, 10s, DC.

Single Pulse Power Rating, Junction to Ambient

Single Pulse Power Rating, Junction to Ambient chart. Y-axis: Power (W) from 0 to 160. X-axis: Pulse Width(s) from 0.0001 to 100. T$_{J(MAX)}$=150℃, T$_A$=25℃, R$\theta$$_{JA}$=145℃/W

Transient Thermal Response Curves

Transient Thermal Response Curves chart. Y-axis: r(t), Normalized Transient Thermal Resistance from 0.001 to 1. X-axis: t1, Square Wave Pulse Duration(s) from 0.0001 to 1000. Curves labeled D=0.5, 0.2, 0.1, 0.05, 0.02, 0.01, Single Pulse.

1.R$\theta$$_{JA}$(t)=r(t)*R$\theta$$_J$
2.Duty Factor D=t1/t2
3.T$_{JM}$
...RθP$_{DM}$=150℃/W

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SOT23 Package Outline Dimensions

Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	0.90	1.05	1.20	e₁	--	0.95	--
A₁	0.01	0.05	0.10	H_E	2.10	2.40	2.50
b_p	0.38	0.42	0.48	L_P	0.40	0.50	0.60
c	0.09	0.13	0.15	Q	0.45	0.49	0.55
D	2.80	2.92	3.00	V	--	0.20	--
E	1.20	1.33	1.40	W	--	0.10	--
e	--	1.90	--				