

P-Channel Enhancement Mode MOSFET

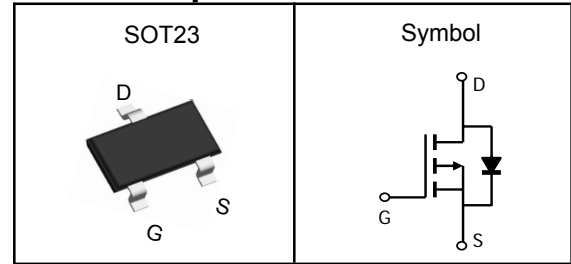
Features

- Low $R_{ds(on)}$ for low conduction loss
- Reliable and Rugged
- ROHS Compliant & Halogen-Free

Applications

- Power Management in Desktop Computer
- DC/DC Converters

Pin Description



V_{DSS}	-50	V
$R_{DS(ON)-Typ}$	6	Ω
I_D	-130	mA

Absolute Maximum Ratings ($T_A=25^\circ\text{C}$, Unless Otherwise Noted)

Symbol	Parameter	Rating	Unit
V_{DSS}	Drain-Source Voltage	-50	V
V_{GSS}	Gate-Source Voltage	± 20	V
T_J	Maximum Junction Temperature	-55 to 150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$I_{DM}^{①}$	Pulse Drain Current Tested	-520	mA
I_D	Continuous Drain Current	-130	mA
P_D	Maximum Power Dissipation	225	mW

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	556	$^\circ\text{C}/\text{W}$

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

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

Note ③ : Surface Mounted on 1in^2 FR-4 board with 1oz.



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Electrical Characteristics ($T_J=25^{\circ}\text{C}$, Unless Otherwise Noted)

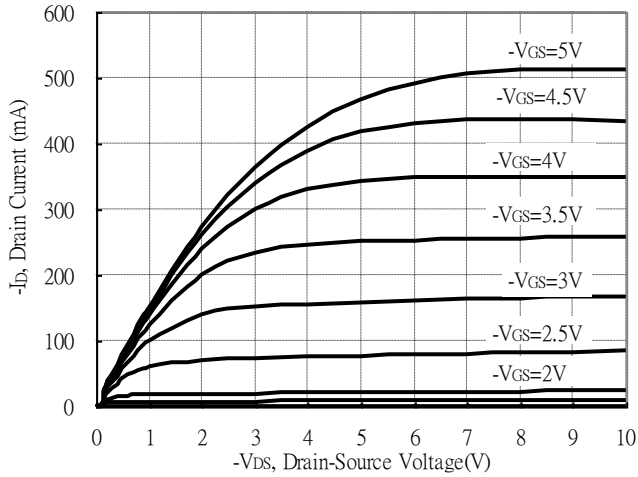
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-50	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-50V, V_{GS}=0V$	---	---	-1	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-0.001A$	-0.8	---	-2.0	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 10	μA
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS}=-5V, I_D=-0.1A$	---	6	10	Ω
gfs	Forward Transconductance	$V_{DS}=-25V, I_D=-0.1A$	50	---	---	mS
Dynamic Characteristics^⑤						
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=-5V,$ Freq.=1MHz	---	25	---	pF
C_{oss}	Output Capacitance		---	7	---	
C_{rss}	Reverse Transfer Capacitance		---	2	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DD}=-15V, I_D=-0.1A,$ $V_{GS}=-5V, R_G=3.3\Omega$	---	2.5	---	nS
T_r	Turn-on Rise Time		---	2	---	
$T_{d(off)}$	Turn-off Delay Time		---	7.3	---	
T_f	Turn-off Fall Time		---	3	---	
Q_g	Total Gate Charge	$V_{GS}=-5V, V_{DS}=-40V,$ $I_D=-0.5A$	---	1.2	---	nC
Q_{gs}	Gate-Source Charge		---	0.7	---	
Q_{gd}	Gate-Drain Charge		---	1.3	---	
Source-Drain Characteristics						
$V_{SD}^{④}$	Diode Forward Voltage	$I_S=-0.13A, V_{GS}=0V$	---	---	-1.2	V

Note ④: Pulse test (pulse width 300us, duty cycle 2%).

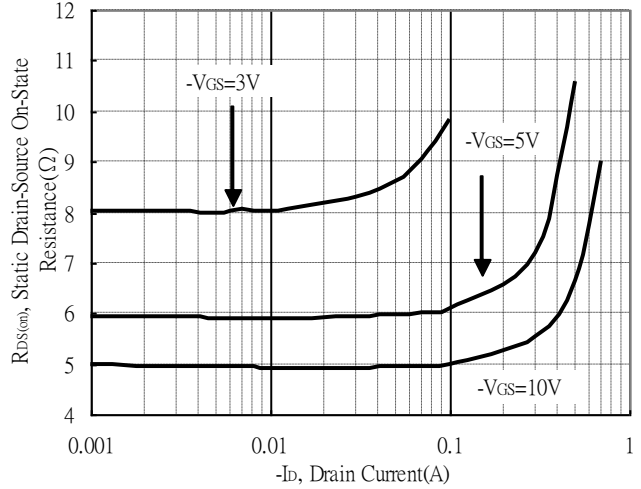
Note ⑤: Guaranteed by design, not subject to production testing.

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Typical Characteristics

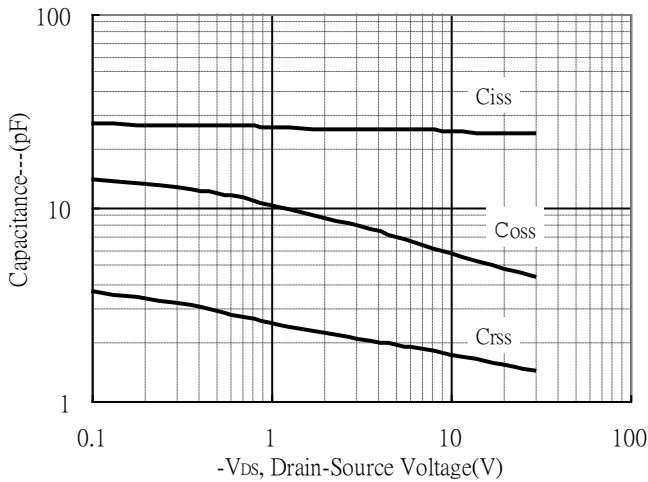
Typical Output Characteristics



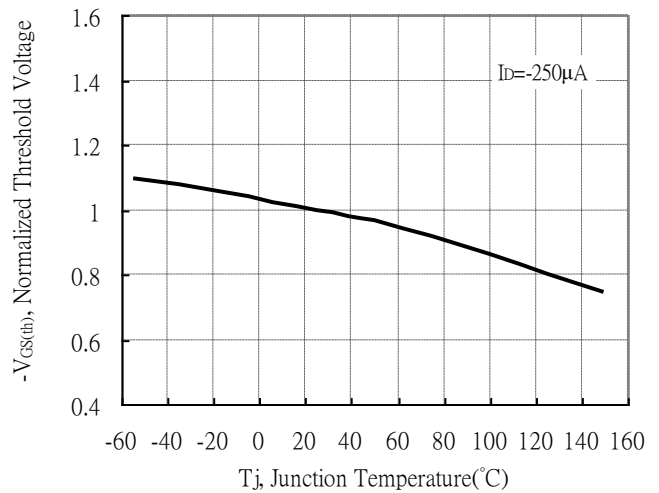
Static Drain-Source On-State resistance vs Drain Current



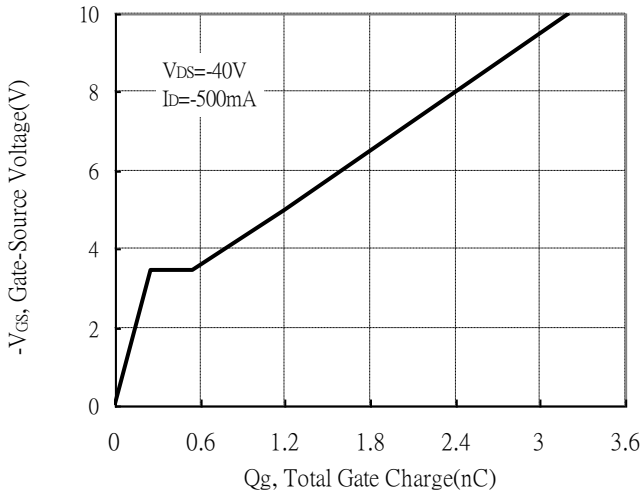
Capacitance vs Drain-to-Source Voltage



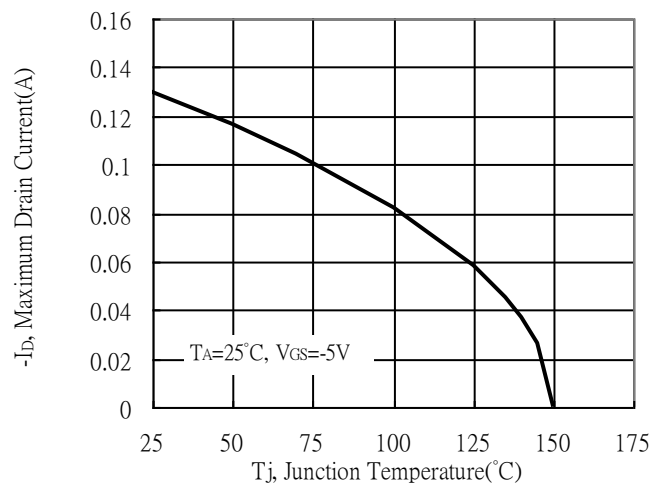
Threshold Voltage vs Junction Temperature



Gate Charge Characteristics

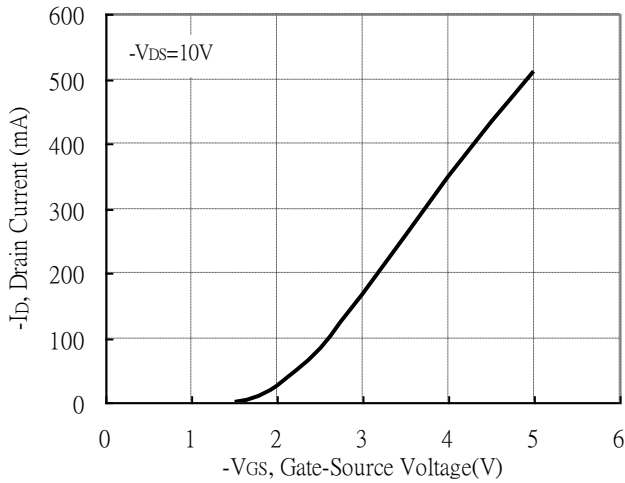


Maximum Drain Current vs Junction Temperature

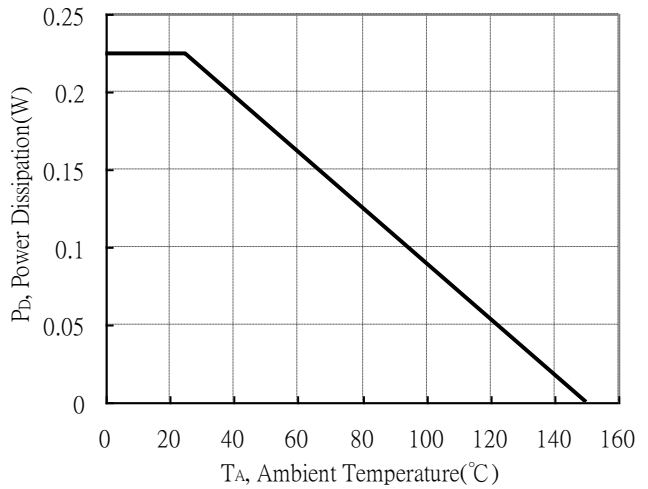


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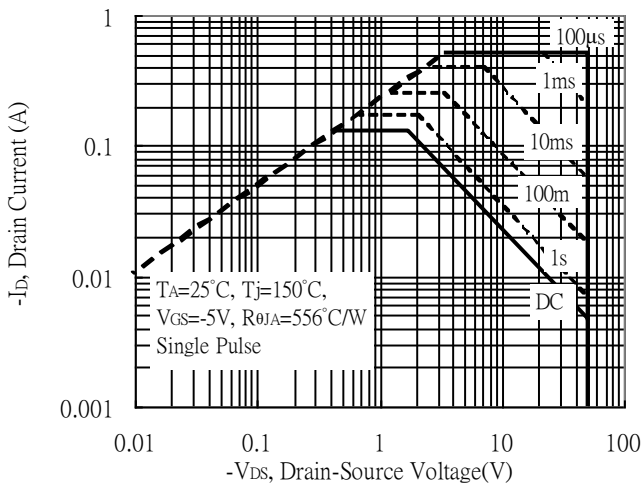
Typical Transfer Characteristics



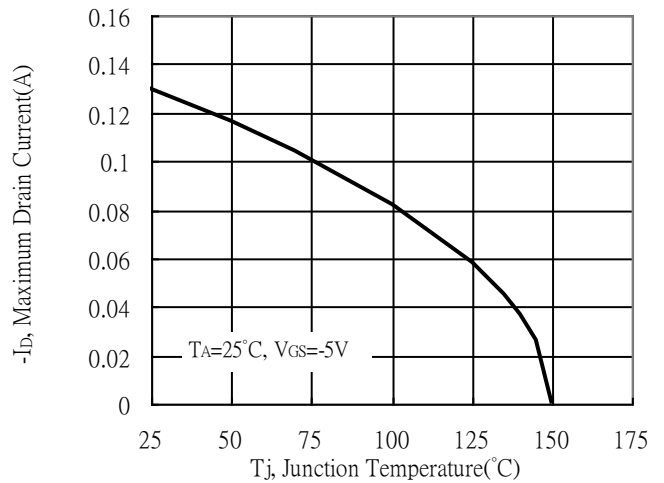
Power Derating Curve



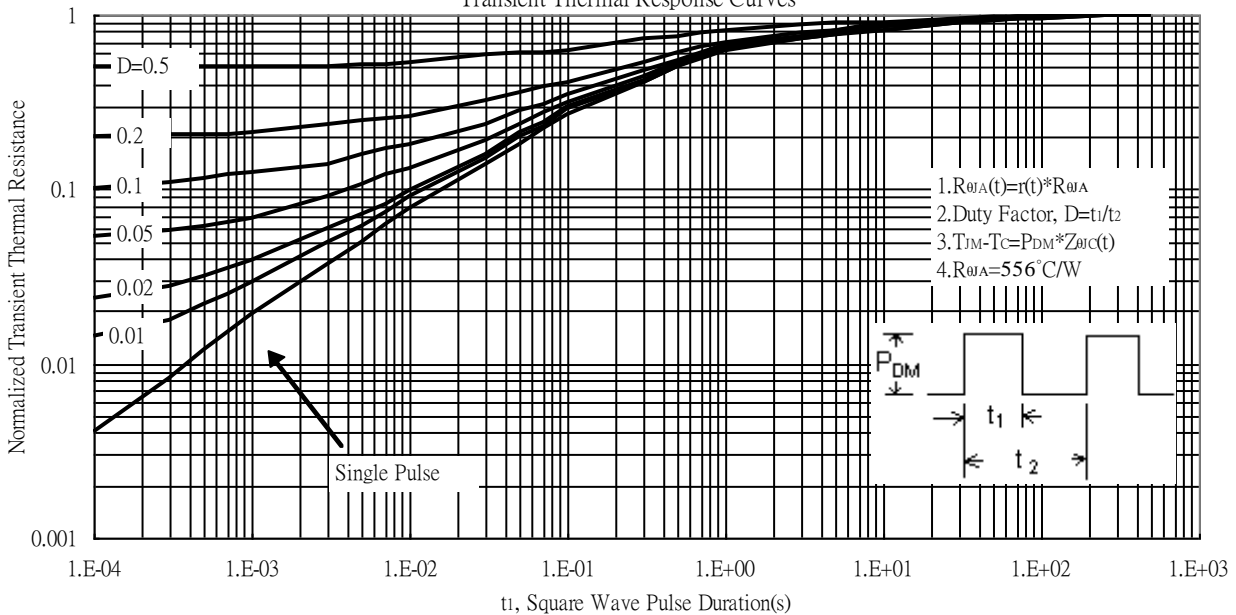
Maximum Safe Operating Area



Maximum Drain Current vs Junction Temperature



Transient Thermal Response Curves



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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	--				