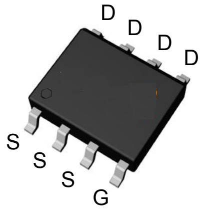
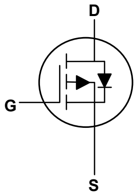
P-Channel Enhancement Mode MOSFET

Features

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

Pin Description

SOP-8	Symbol
	

Applications

- Power Management in Desktop Computer
- DC/DC Converters

V_{DSS}	-30	V
$R_{DS(ON)-Typ}$	7.5	mΩ
I_D	-14	A

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

Symbol	Parameter		P-Channel	Unit
V_{DSS}	Drain-Source Voltage		-30	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		-56	A
I_D	Continuous Drain Current		-14	A
P_D	Maximum Power Dissipation	T_A=25℃	1.5	W
I_{AS}	Avalanche Current		-55	A
EAS	Single Pulse Avalanche Energy		151	mJ

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$③	Thermal Resistance-Junction to Ambient	75	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case	24	℃/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 $1in^2$ FR-4 board with 1oz.

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	-30	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-24V, V_{GS}=0V	---	---	-1	uA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} , I_D=-250uA	-1.2	---	-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=-12A	---	7.5	12	mΩ
		V_{GS}=-4.5V, I_D=-10A	---	10.8	15.5	mΩ
gfs	Forward Transconductance	V_{DS}=-5V, I_D=-12A	---	25	---	S
Dynamic Characteristics⑤						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=-15V, Freq.=1MHz	---	3448	---	pF
C_{oss}	Output Capacitance		---	508	---	
C_{rss}	Reverse Transfer Capacitance		---	421	---	
$T_{d(on)}$	Turn-on Delay Time	V_{DD}=-15V , V_{GS}=-10V , R_G=3.3Ω, I_D=-1A	---	9.4	---	nS
T_r	Turn-on Rise Time		---	10.2	---	
$T_{d(off)}$	Turn-off Delay Time		---	117	---	
T_f	Turn-off Fall Time		---	24	---	
Q_g	Total Gate Charge	V_{DS}=-15V , V_{GS}=-4.5V, I_D=-12A	---	30	---	nC
Q_{gs}	Gate-Source Charge		---	10	---	
Q_{gd}	Gate-Drain Charge		---	10.4	---	
Source-Drain Characteristics （T_J=25℃）						
V_{SD}④	Diode Forward Voltage	V_{GS}=0V , I_S=-1A , T_J=25℃	---	---	-1.2	V
trr	Reverse Recovery Time	I_F=-10A, di/dt=100A/μs，T_J=25℃	---	19.4	---	nS
Qrr	Reverse Recovery Charge		---	9.1	---	nC

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

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

Typical Characteristics

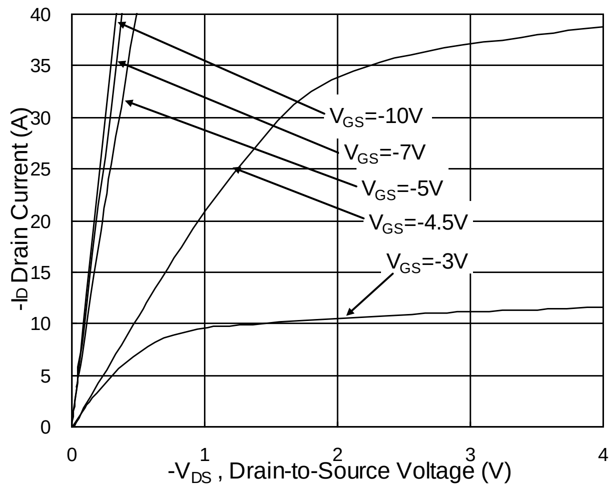


Fig.1 Typical Output Characteristics

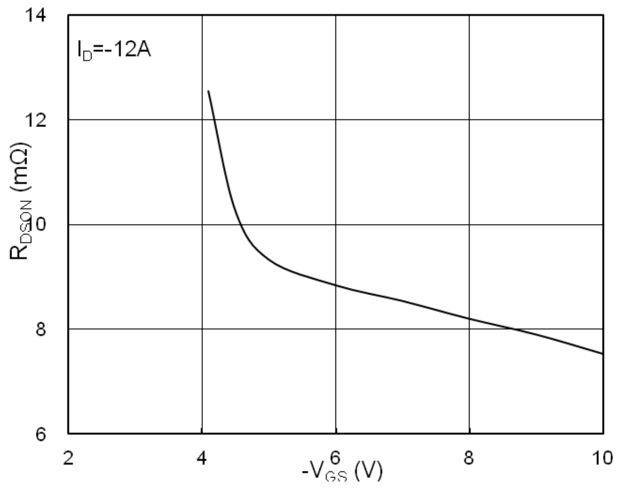


Fig.2 On-Resistance v.s Gate-Source

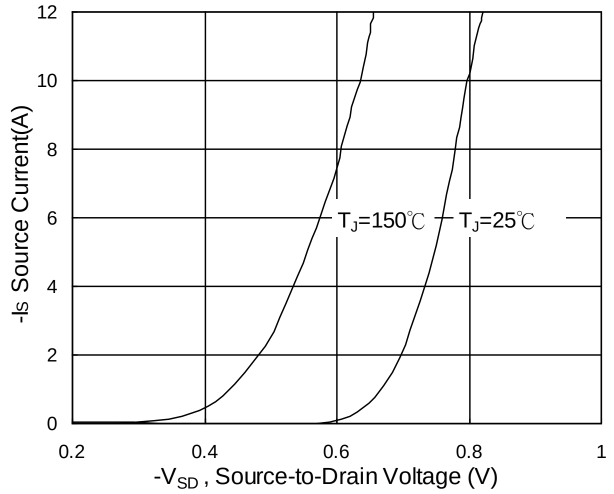


Fig.3 Forward Characteristics Of Reverse

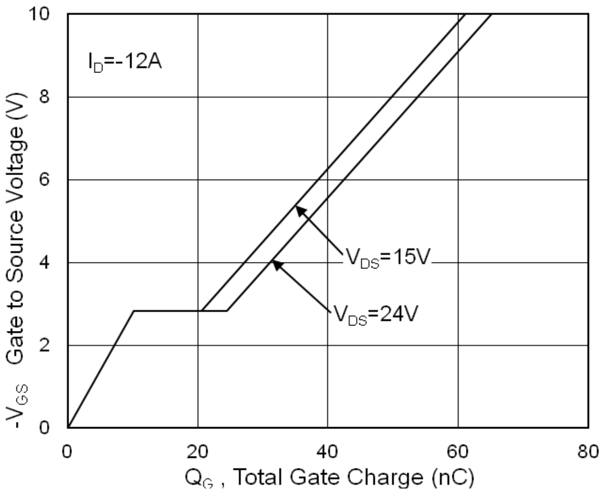


Fig.4 Gate-Charge Characteristics

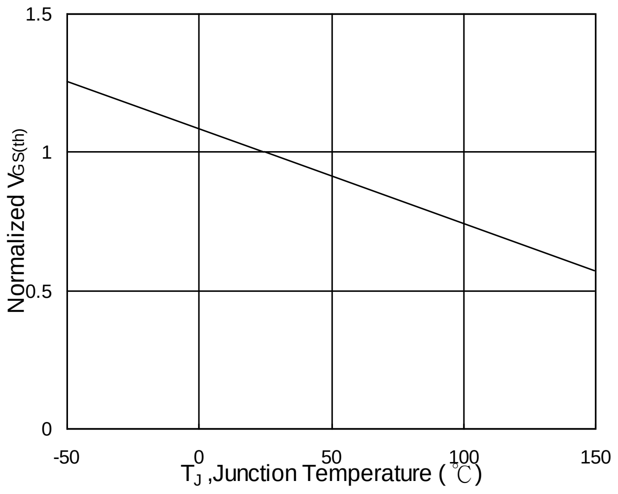


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

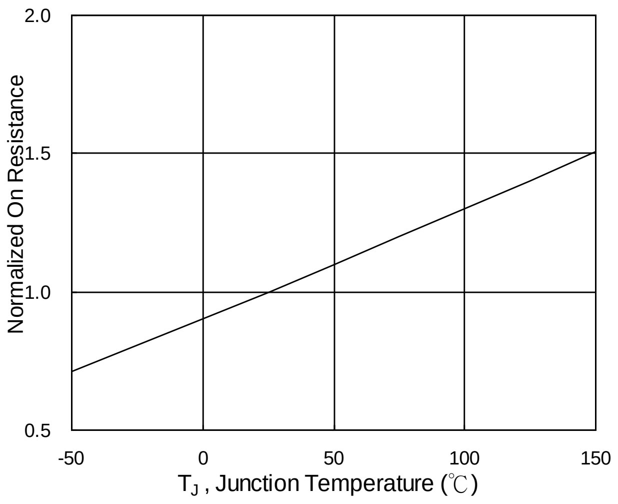


Fig.6 Normalized R_{DSON} vs. T_J

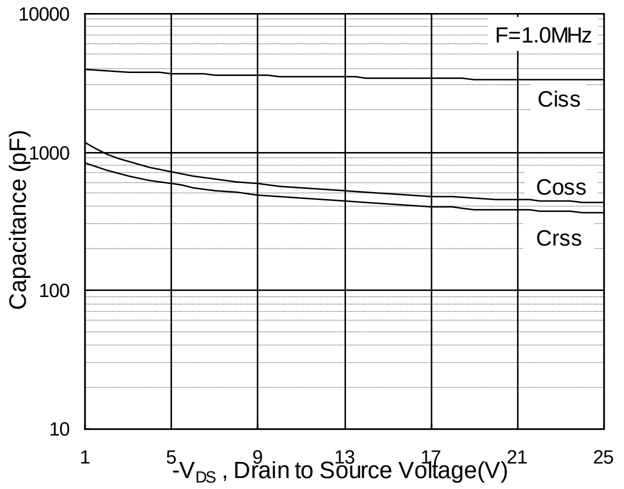


Fig.7 Capacitance

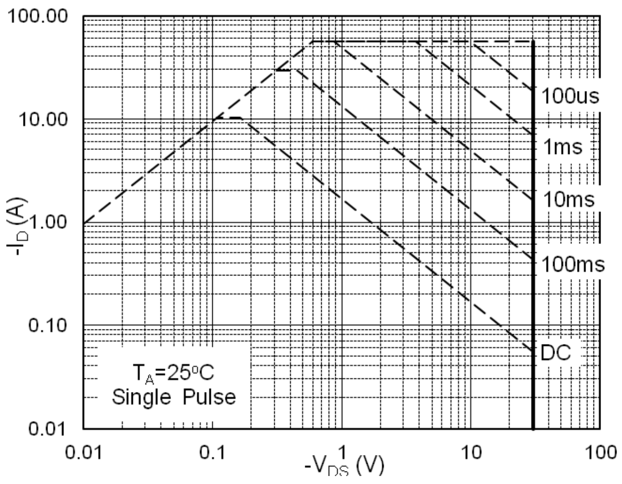


Fig.8 Safe Operating Area

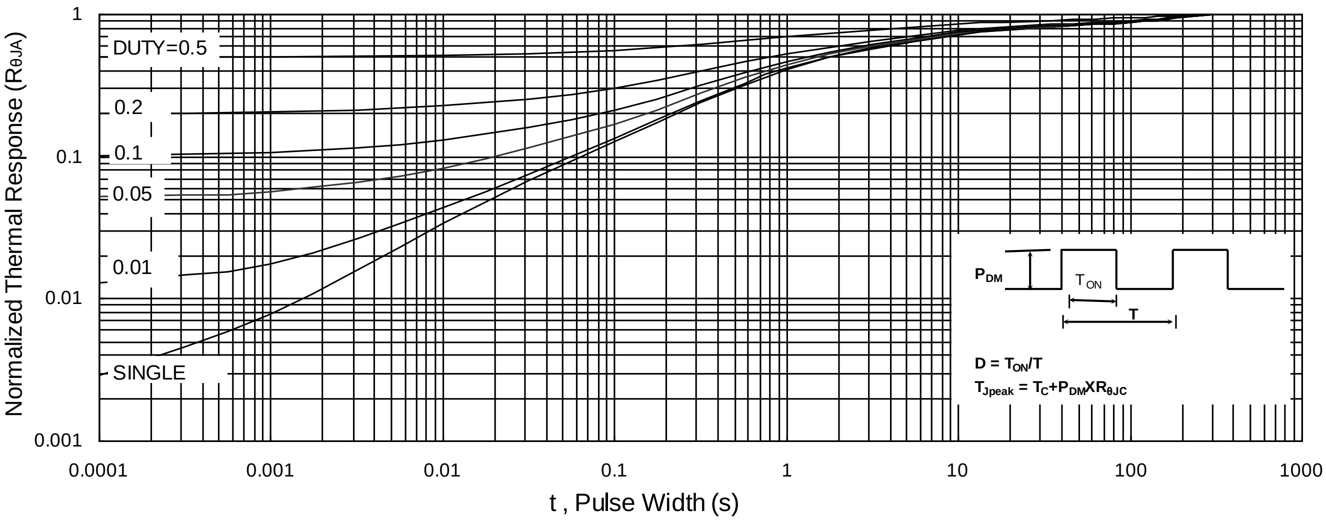


Fig.9 Normalized Maximum Transient Thermal Impedance

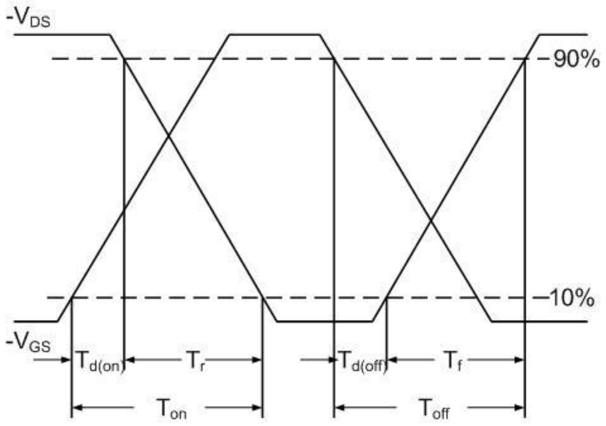


Fig.10 Switching Time Waveform

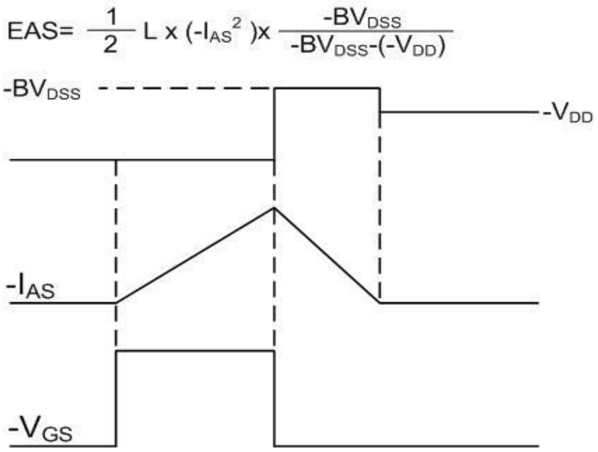
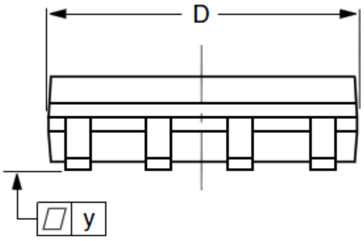
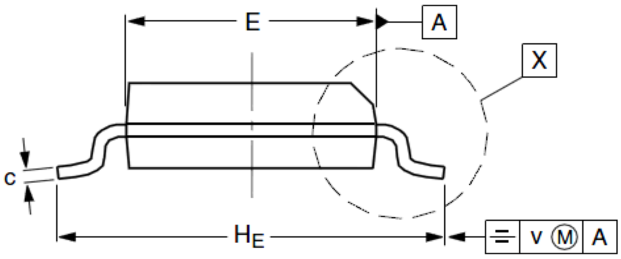
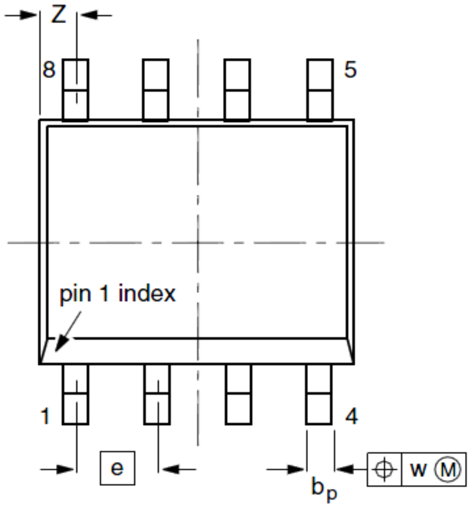


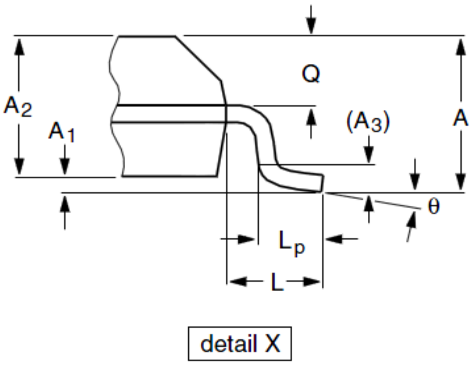
Fig.11 Unclamped Inductive Switching Waveform

SOT-8 Package Outline Dimensions









Symbol	**Dimensions** (unit:mm)			Symbol	**Dimensions** (unit:mm)		
	Min	**Typ**	**Max**		**Min**	**Typ**	**Max**
A	1.35	1.55	1.75	**A_1**	0.10	0.18	0.25
A_2	1.25	1.45	1.65	**A_3**	--	0.25	--
b_p	0.36	0.42	0.51	**c**	0.19	0.22	0.25
D	4.70	4.92	5.10	**E**	3.80	3.90	4.00
e	--	1.27	--	**H_E**	5.80	6.00	6.20
L	--	1.05	--	**L_P**	0.40	0.68	1.00
Q	0.60	0.65	0.73	**v**	--	0.25	--
w	--	0.25	--	**y**	--	0.10	--
Z	0.30	0.50	0.70	**θ**	0°		8°