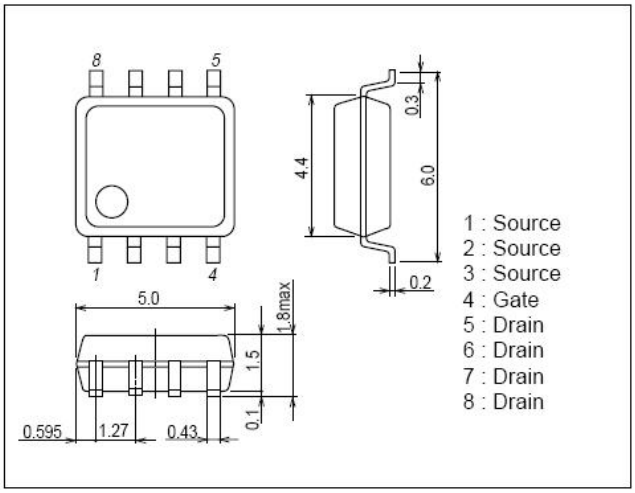
Si4407

Features

- Low On resistance.
- −4.5V drive.
- RoHS compliant.

Package Dimensions

unit : mm
SOP-8



Specifications

Absolute Maximum Ratings at T_a=25^{0}C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		-30	V
Gate-to-Source Voltage	V_{GSS}		±20	V
Drain Current (DC)	I_D		-11.5	A
Drain Current (Pulse)	I_{DP}	PW≤10uS, duty cycle≤1%	-45	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (1000mm^2×0.8mm) 1unit	1.3	W
Total Dissipation	P_T	Mounted on a ceramic board (1000mm^2×0.8mm)	1.7	W
Channel Temperature	T_{ch}		150	^{0}C
Storage Temperature	T_{stg}		-55~+150	^{0}C

Electrical Characteristics at T_a=25^{0}C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=-250uA, V_{GS}=0V	-30	-34	-	V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=-30V, V_{GS}=0V	-	-	-10	uA
Gate-to-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=-250uA	-1.0	-1.4	-2.5	V
Forward Transconductance	g_{FS}	V_{DS}=-5V, I_D=-10A	-	24	-	S
Gate Resistance	R_g	V_{DS}=0V , V_{GS}=0V , f=1MHz	-	9	-	Ω
Static Drain-to-Source On-State Resistance	$R_{DS(ON)}$	I_D=-12A, V_{GS}=-10V	-	11.5	15	mΩ
	$R_{DS(ON)}$	I_D=-10A, V_{GS}=-5V	-	17	25	mΩ
Input Capacitance	C_{iss}	V_{DS}=-15V, V_{GS}=0V, f=1MHz	-	2215	-	pF
Output Capacitance	C_{oss}	V_{DS}=-15V, V_{GS}=0V, f=1MHz	-	310	-	pF
Reverse Transfer Capacitance	C_{rss}	V_{DS}=-15V, V_{GS}=0V, f=1MHz	-	237	-	pF

Electrical Characteristics at T_a=25^{0}C (Continued)

Parameter	Symbol	Conditions	Ratings			Unit
			min	Typ	max	
Turn-on Delay Time	$t_{d(on)}$	V_{GS}=-10V, V_{DS}=-15V, R_L=1.25Ω, R_{GEN}=3Ω		33.8		nS
Rise Time	t_r			35.8		nS
Turn-off Delay Time	$t_{d(off)}$			72.8		nS
Fall Time	t_f			10.6		nS
Total Gate Charge	Q_g	V_{DS}=-10V, V_{GS}=-15V, I_D=-12A		20		nC
Gate-to-Source Charge	Q_{gs}			5.1		nC
Gate-to-Drain “Miller” Charge	Q_{gd}			7.3		nC
Diode Forward Voltage	V_{SD}	I_S=-1A, V_{GS}=0V		-0.7	-1.0	V

Typical Characteristics at T_a=25^{0}C

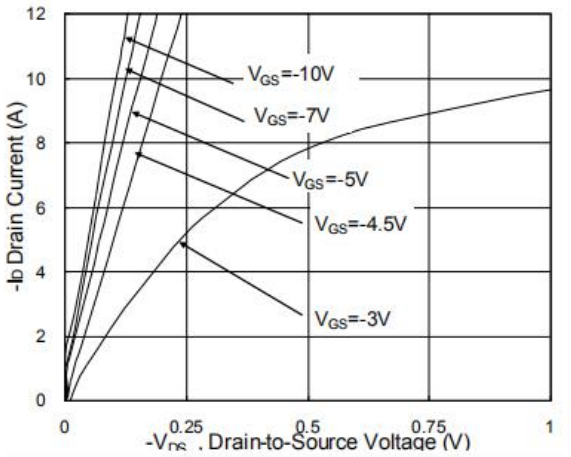


Fig.1 Typical Output Characteristics

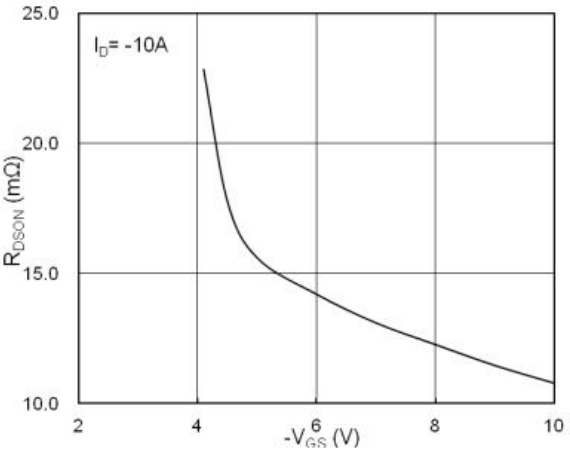


Fig.2 On-Resistance vs. G-S Voltage

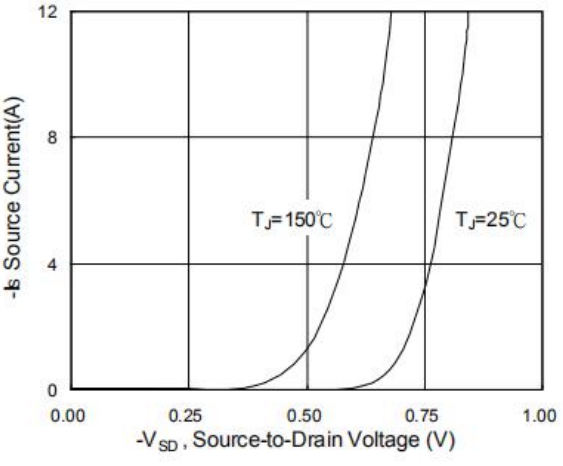


Fig.3 Forward Characteristics of Reverse

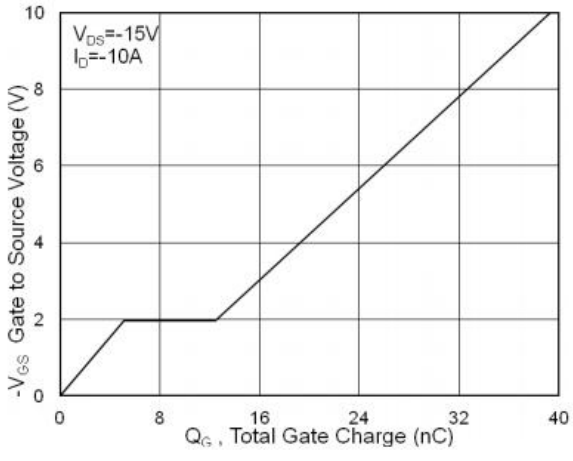


Fig.4 Gate-charge Characteristics

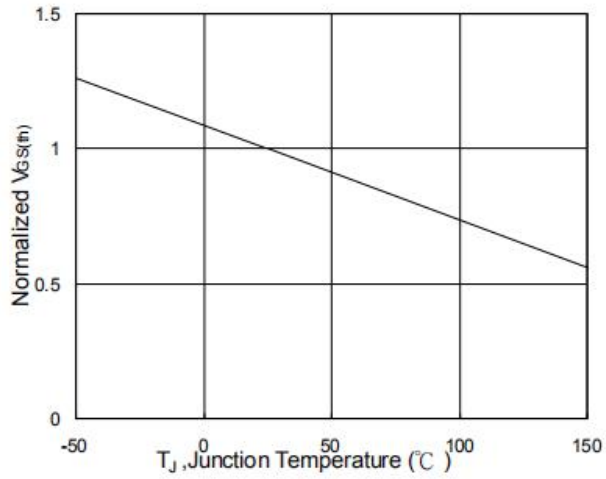


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

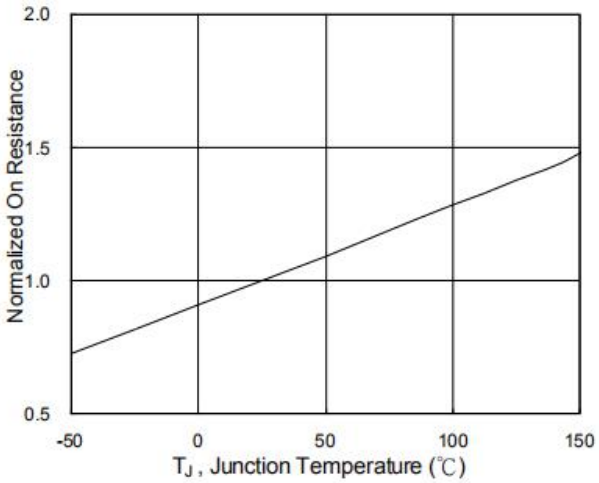


Fig.6 Normalized R_{DSON} vs. T_J

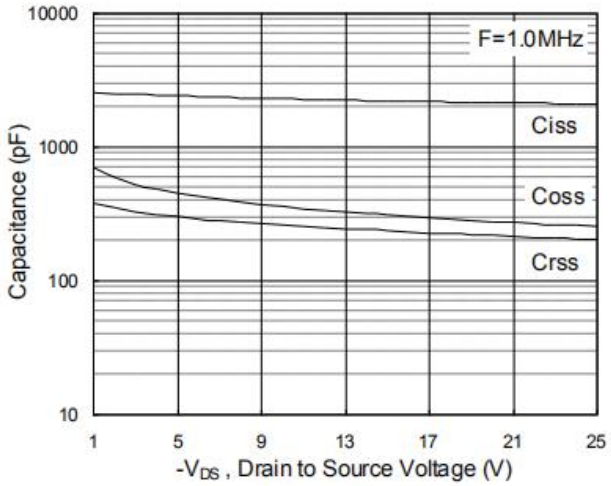


Fig.7 Capacitance

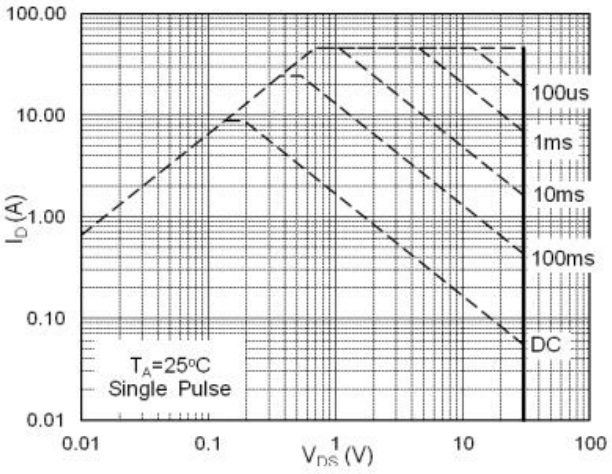


Fig.8 Safe Operating Area

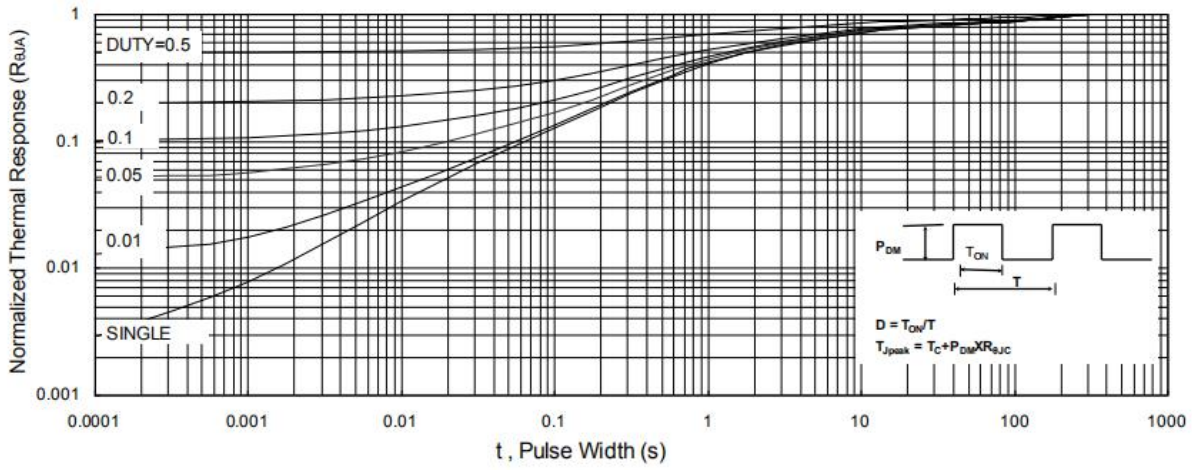


Fig.9 Normalized Maximum Transient Thermal Impedance

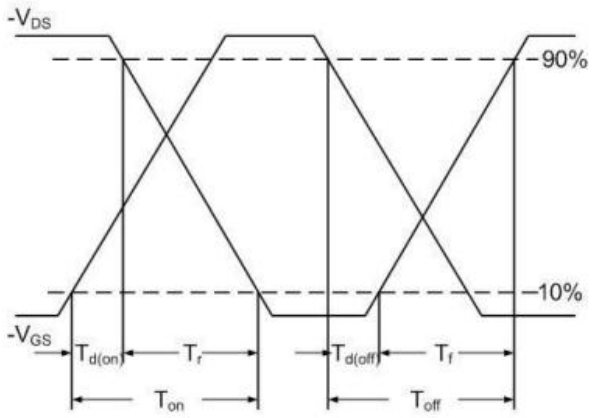


Fig.10 Switching Time Waveform

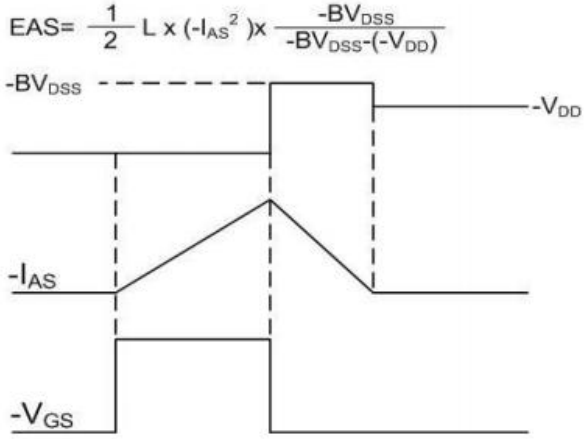


Fig.11 Unclamped Inductive Waveform