

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
100V	90mΩ@10V	10A
	100mΩ@4.5V	



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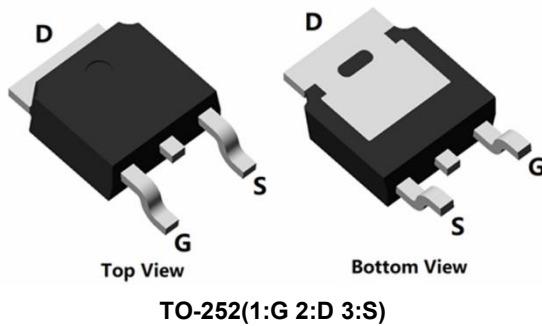
Feature

- Fast Switching
- Low Gate Charge and $R_{DS(on)}$
- 100% Single Pulse avalanche energy Test

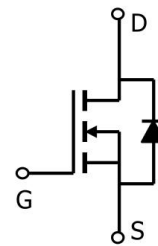
Applications

- DC-DC Converter
- Load Switching

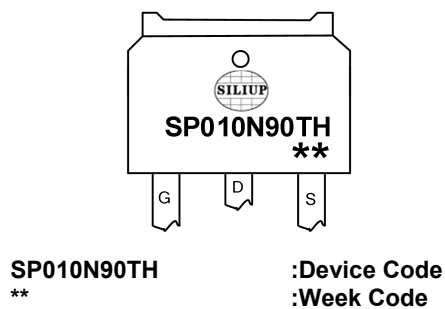
Package



Circuit diagram



Marking



Order Information

Device	Package	Unit/Tape
SP010N90TH	TO-252	2500

Absolute maximum ratings (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_C=25^\circ\text{C}$)	I_D	10	A
Continuous Drain Current ($T_C=100^\circ\text{C}$)	I_D	7	A
Pulsed Drain Current	I_{DM}	40	A
Single Pulse Avalanche Energy ¹	E_{AS}	12	mJ
Power Dissipation ($T_C=25^\circ\text{C}$)	P_D	50	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	2.5	$^\circ\text{C/W}$
Storage Temperature Range	T_{STG}	-55 to 150	$^\circ\text{C}$
Operating Junction Temperature Range	T_J	-55 to 150	$^\circ\text{C}$

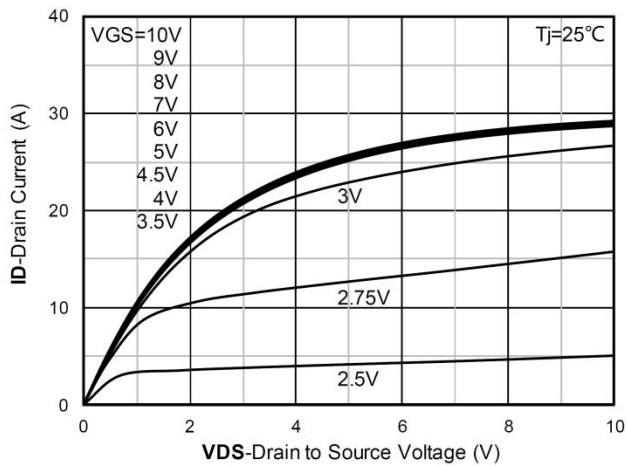
Electrical characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	VGS=0V , ID=250uA	100	-	-	V
Drain-Source Leakage Current	IDSS	VDS=80V , VGS=0V , TJ=25℃	-	-	1	uA
Gate-Source Leakage Current	IGSS	VGS=±20V , VDS=0V	-	-	±100	nA
Gate Threshold Voltage	VGS(th)	VGS=VDS , ID =250uA	1.0	1.6	2.5	V
Static Drain-Source On-Resistance	RDS(ON)	VGS=10V , ID=10A	-	90	110	mΩ
		VGS=4.5V , ID=8A	-	100	120	
Dynamic characteristics						
Input Capacitance	Ciss	VDS=50V , VGS=0V , f=1MHz	-	845	-	pF
Output Capacitance	Coss		-	30	-	
Reverse Transfer Capacitance	Crss		-	23	-	
Total Gate Charge	Qg	VDS=50V , VGS=10V , ID=10A	-	16	-	nC
Gate-Source Charge	Qgs		-	2.5	-	
Gate-Drain Charge	Qgd		-	2.6	-	
Switching Characteristics						
Turn-On Delay Time	Td(on)	VDD=50V VGS=10V , RG=3Ω, ID=10A	-	5	-	nS
Rise Time	Tr		-	21	-	
Turn-Off Delay Time	Td(off)		-	24	-	
Fall Time	Tf		-	3	-	
Diode Characteristics						
Diode Forward Voltage	VSD	VGS=0V , IS=1A , TJ=25℃	-	-	1.2	V
Maximum Body-Diode Continuous Current	IS		-	-	10	A
Reverse Recovery Time	Trr	IS=10A, di/dt=100A/us, TJ=25℃	-	27	-	nS
Reverse Recovery Charge	Qrr		-	21	-	nC

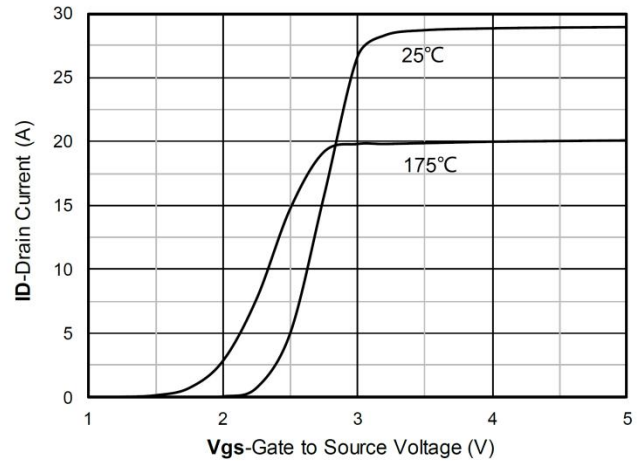
Note :

1. The EAS test condition is $V_{DD}=50V, V_{GS}=10V, L=0.5mH, R_G=25\Omega$

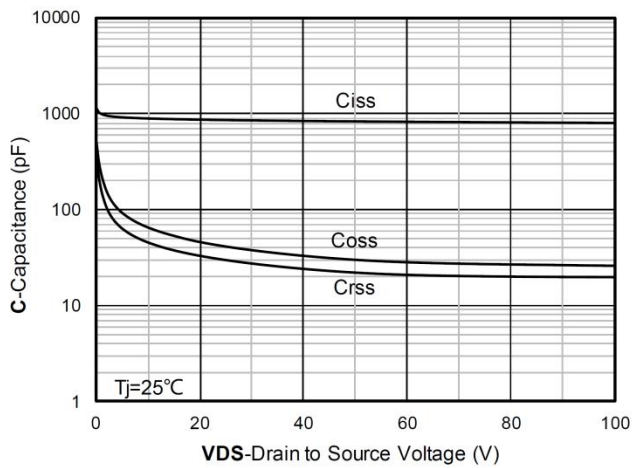
Typical Characteristics



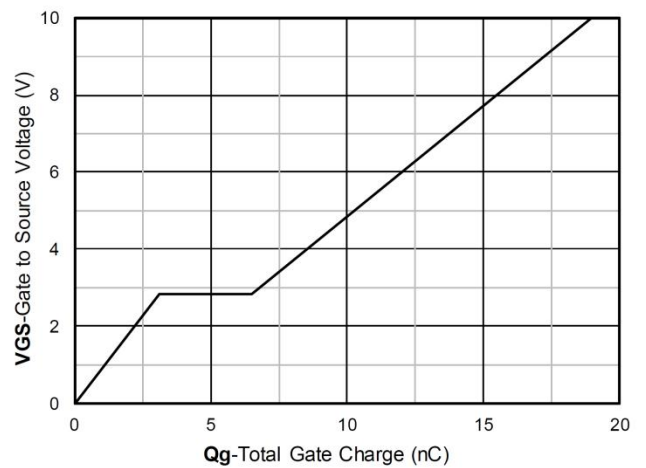
Output Characteristics



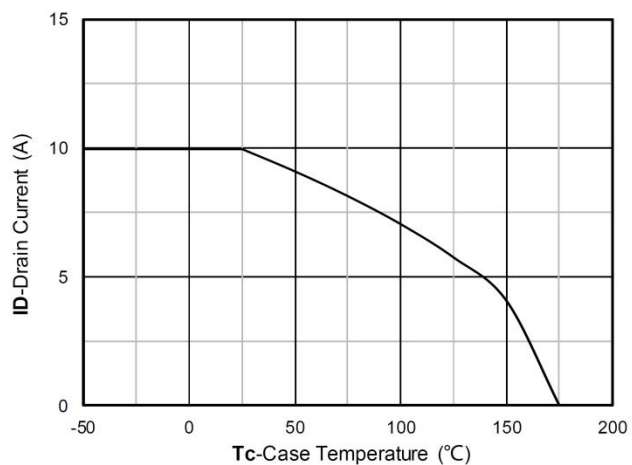
Transfer Characteristics



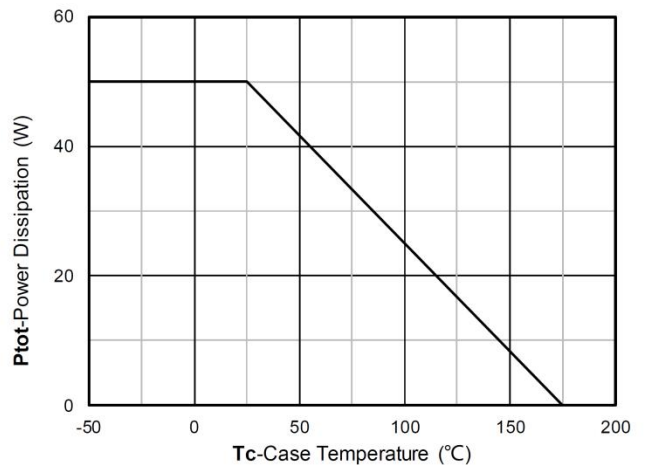
Capacitance Characteristics



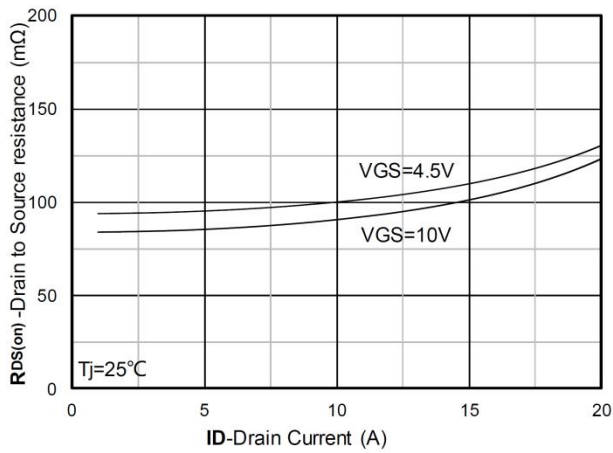
Gate Charge



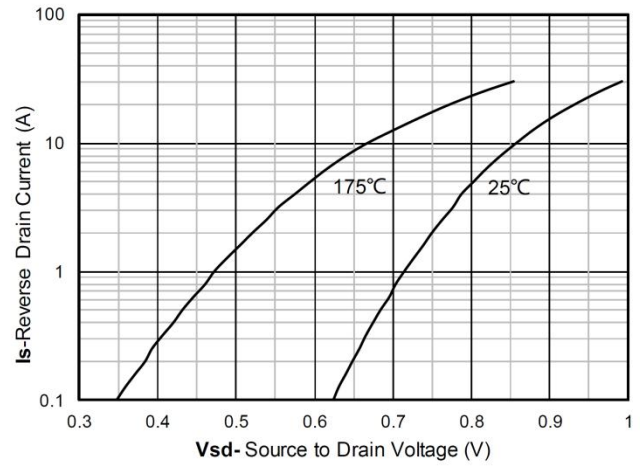
Current dissipation



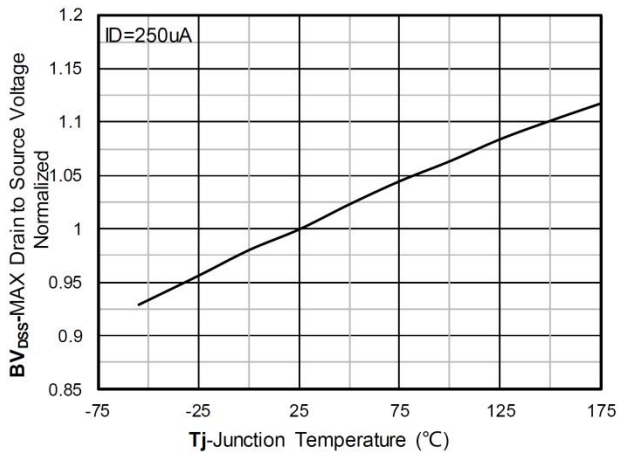
Power dissipation



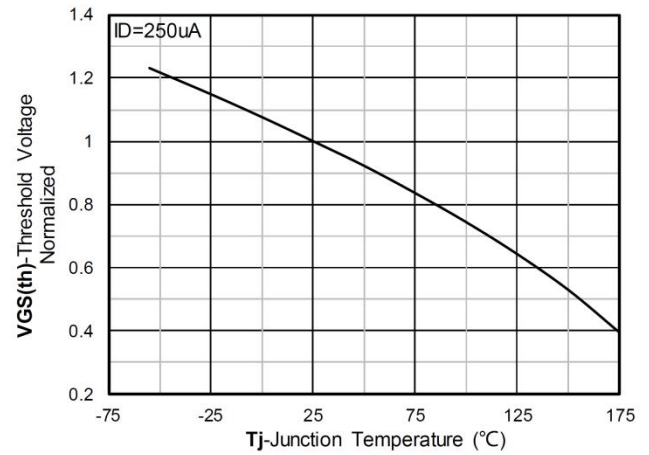
RDS(on) VS Drain Current



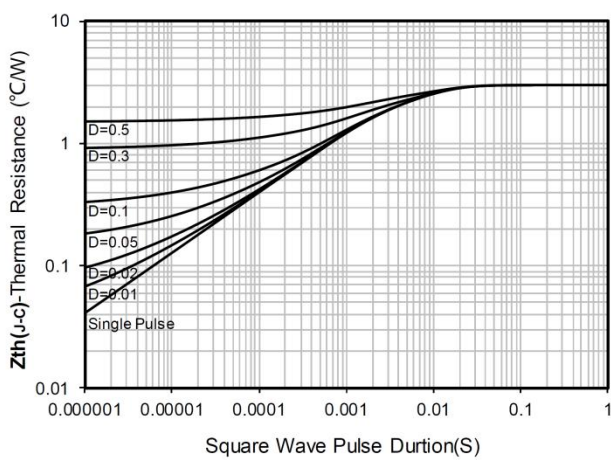
Forward characteristics of reverse diode



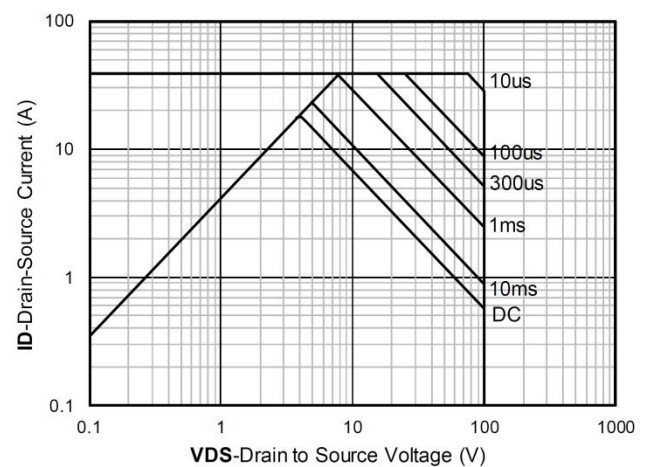
Normalized breakdown voltage



Normalized Threshold voltage



Maximum Transient Thermal Impedance



Safe Operation Area

TO-252 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 REF.		0.211 REF.	

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