SemTron Microtech Corporation

STC4545

30V Complementary MOSFET

DESCRIPTION

The STC4545 is the N & P-Channel enhancement mode power field effect transistor is produced using high cell density. advanced trench technology to provide excellent $R_{DS(ON)}$.
This device iswidely preferred for commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters applications.

STC4545M-TRG ROHS Compliant This is Halogen Free

FEATURE

N-Channel

- ***30V / 6.8A, $R_{DS(ON)}$ =18mΩ(typ.)@V_{GS} =10V***
- ***30V / 6.0A, $R_{DS(ON)}$ =20mΩ(typ.)@V_{GS} =4.5V***

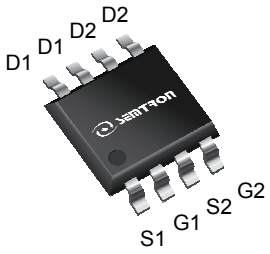
P-Channel

- ***-30V / -6.5A, $R_{DS(ON)}$ =38mΩ(typ.)@V_{GS} =-10V***
- ***-30V / -5.0A, $R_{DS(ON)}$ =54mΩ(typ.)@V_{GS} =-4.5V***
- Super high density cell design for extremely low $R_{DS(ON)}$
- Fast switching performance.

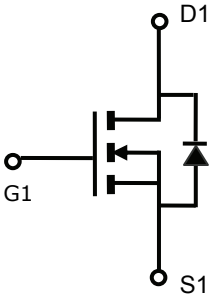
APPLICATIONS

- Power Management in Notebook Computer, Portable Equipment and Battery Powered Systems.
- Hight Frequency Synchronous Buck DC-DC Converter.

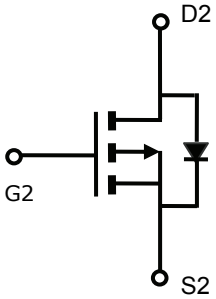
PIN CONFIGURATION



SOP-8
Top View



N-Channle



P-Channle

PART NUMBER INFORMATION

ST C 4545 M - TR G a b c d e f	**a : Company name.** **b : Channel type.** **c : Product Serial number.** **d : Package code** **e : Handling code** **f : Green product code**

■ ORDERING INFORMATION

Part Number	Package Code	Handling Code	Shipping
STC4545M-TRG	M : SOP-8	TR : Tape&Reel	2.5K/Reel

※ Year Code : 00 ~ 90, 2010 : 00
※ Week Code : 01 ~ 54
※ SOP-8 : Only available in tape and reel packaging.

■ ABSOLUTE MAXIMUM RATINGS (T_A = 25°C Unless otherwise noted)

Symbol	Parameter		Typical N	Typical P	Unit
V_{DSS}	Drain-Source Voltage		30	-30	V
V_{GSS}	Gate-Source Voltage		±20	±20	V
I_D	Continuous Drain Current, V_{GS}=10V[A]	T_A=25°C	6.8	-6.5	A
		T_A=70°C	6.2	-5.8	
I_{DM}	Pulsed Drain Current[B]		25	-25	A
E_{AS}	Single Pulse Avalanche Energy L=0.1mH [C]		27	37	mJ
I_{AS}	Avalanche Current		12.8	-15.2	A
P_D	Power Dissipation	T_A=25°C T_A=70°C	2.0 1.4	2.0 1.4	W
T_J	Operation Junction Temperature		-55/150		°C
T_{STG}	Storage Temperature Range		-55/150		°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.
Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ THERMAL DATA

Symbol	Parameter		Min	Typ	Max	Unit
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient[A]	Steady-State			85	°C/W
$R_{\theta JC}$	Thermal Resistance Junction to Lead[A]	Steady-State			60	°C/W

N-CHANNEL ELECTRICAL CHARACTERISTICS

(T_A = 25°C Unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS} =0V,I_D =250μA	30			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} =V_{GS},I_D =250μA	1.0		2.0	V
I_{GSS}	Gate Leakage Current	V_{DS} =0V,V_{GS}=±20V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} =24V,V_{GS} =0V T_J =25°C			1	μA
		V_{DS} =24V,V_{GS} =0V T_J =55°C			5	
$R_{DS(ON)}$	Drain-source On-Resistance[B]	V_{GS} =10V,I_D=6.8A V_{GS} =4.5V, I_D=6.0A		18 20	22 24	mΩ
G_{fs}	Forward Transconductance	V_{DS} =5.0V,I_D =6.8A		5.6		S
Source-Drain Doide						
V_{SD}	Diode Forward Voltage[B]	I_S=1.0A,V_{GS}=0V			1.2	V
I_S	Continuous Source Current[AD]				6.2	A
Dynamic Parameters						
Q_g (4.5V)	Total Gate Charge	V_{DS} =15V,V_{GS} =4.5V I_D =6.0A		4.9	7.0	nC
Q_{gs}	Gate-Source Charge			1.5		
Q_{gd}	Gate-Drain Charge			1.86		
C_{iss}	Input Capacitance	V_{DS} =15V,V_{GS} =0V f =1MHz		418	588	pF
C_{oss}	Output Capacitance			65		
C_{rss}	Reverse Transfer Capacitance			52		
$t_{d(on)}$	Turn-On Time	V_{DD}=15V, V_{GEN}=10V, R_G=3.3Ω,		2.2		nS
t_r				37		
$t_{d(off)}$	Turn-Off Time			12.2		
t_f				4.8		

Note:

A. The value of $R_{\theta JA}$ is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C.

B. The data tested by pulsed , pulse width ≦ 300uS , duty cycle ≦ 2%

C. The EAS data shows Max. rating . The N Channel test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH.

D. The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

The products and product specifications contained herein are subject to change without notice to improve performance characteristics. Consult us, or our representatives before use, to confirm that the information in this datasheet is up to date

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P-CHANNEL ELECTRICAL CHARACTERISTICS

(T_A = 25°C Unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS} =0V,I_D =250μA	-30			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} =V_{GS},I_D =250μA	-1.0		-2.0	V
I_{GSS}	Gate Leakage Current	V_{DS} =0V,V_{GS}=±20V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} =-24V,V_{GS} =0V T_J =25°C			-1	μA
		V_{DS} =24V,V_{GS} =0V T_J =55°C			-5	
$R_{DS(ON)}$	Drain-source On-Resistance[B]	V_{GS} =-10V,I_D=-6.5 A V_{GS} =-4.5V, I_D=-5.0A		38 54	43 60	mΩ
G_{fs}	Forward Transconductance	V_{DS} =-5.0V,I_D =-7A		6		S
Source-Drain Doide						
V_{SD}	Diode Forward Voltage[B]	I_S=-1.0A,V_{GS}=0V			-1.2	V
I_S	Continuous Source Current[AD]				-6.0	A
Dynamic Parameters						
Q_g (4.5V)	Total Gate Charge	V_{DS} =-15V,V_{GS} =-4.5V I_D =-5.0A		6.5	7.2	nC
Q_{gs}	Gate-Source Charge			2.8		
Q_{gd}	Gate-Drain Charge			3.2		
C_{iss}	Input Capacitance	V_{DS} =-15V,V_{GS} =0V f =1MHz		648	685	pF
C_{oss}	Output Capacitance			270		
C_{rss}	Reverse Transfer Capacitance			105		
$t_{d(on)}$	Turn-On Time	V_{DD}=-15V, V_{GEN}=-10V, R_G=3.3Ω,		9.0		nS
t_r				16.8		
$t_{d(off)}$	Turn-Off Time			22		
t_f				22.6		

Note:

A. The value of $R_{\theta JA}$ is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C.

B. The data tested by pulsed , pulse width ≦ 300uS , duty cycle ≦ 2%

C. The EAS data shows Max. rating . The P Channel test condition is V_{DD}=-25V,V_{GS}=-10V,L=0.1mH.

D. The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

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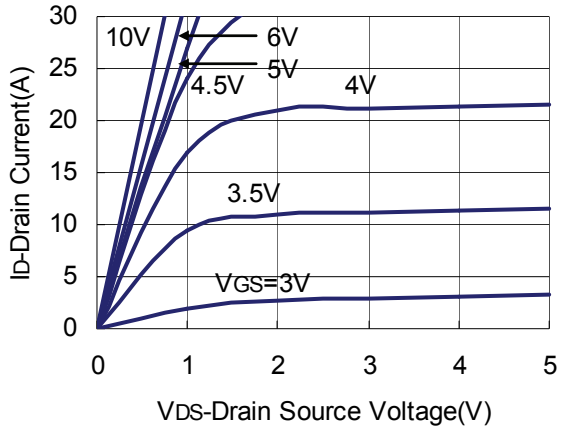
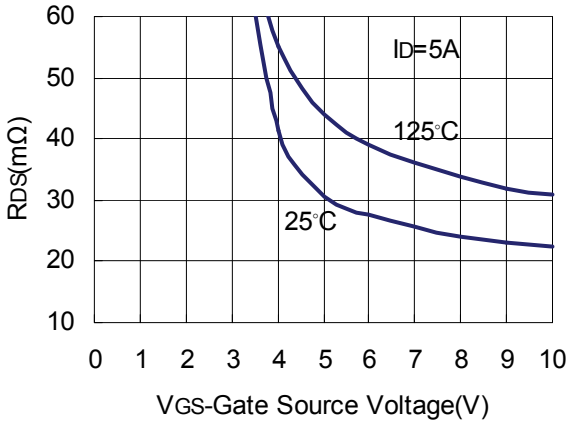
TYPICAL CHARACTERISTICS(N-Channel)

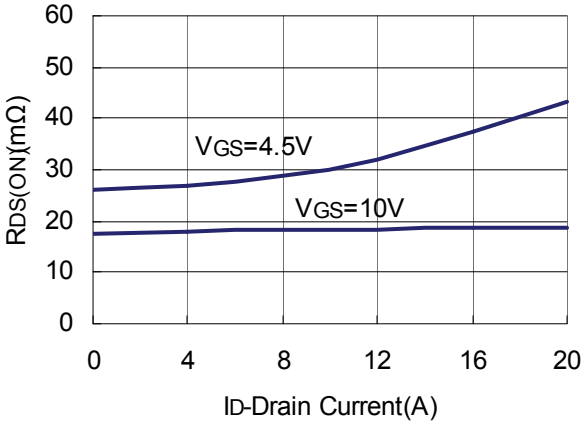
Output Characteristics



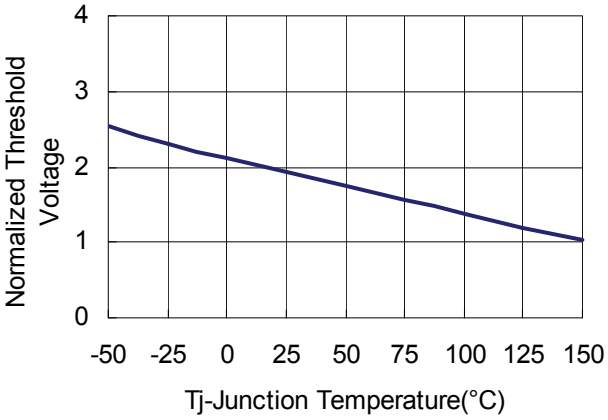
Drain-Source On Resistance



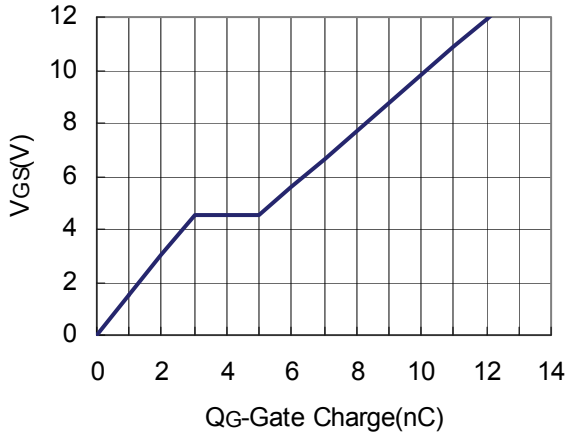
Drain Source On Resistance



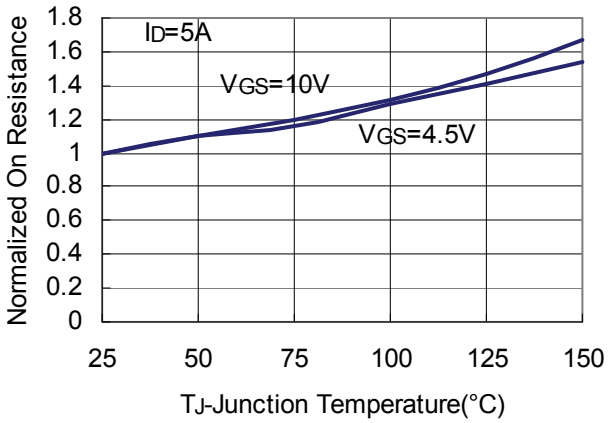
Gate Threshold Voltage



Gate Charge

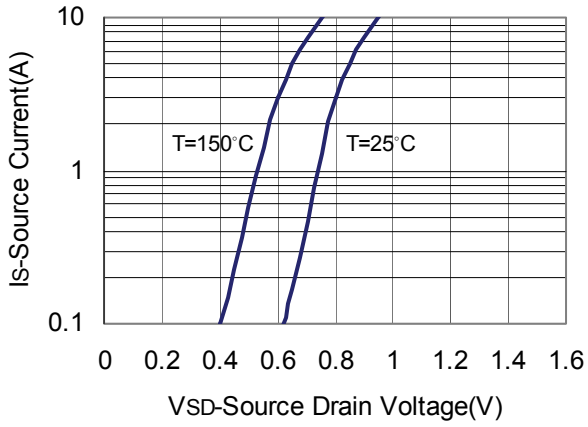


Drain Source On Resistance

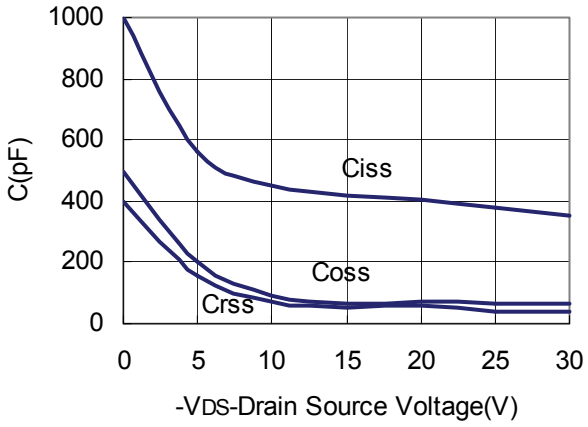


TYPICAL CHARACTERISTICS(N-Channel)

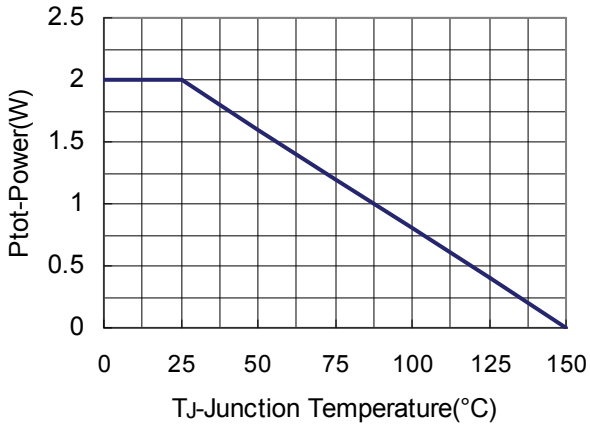
Source Drain Diode Forward



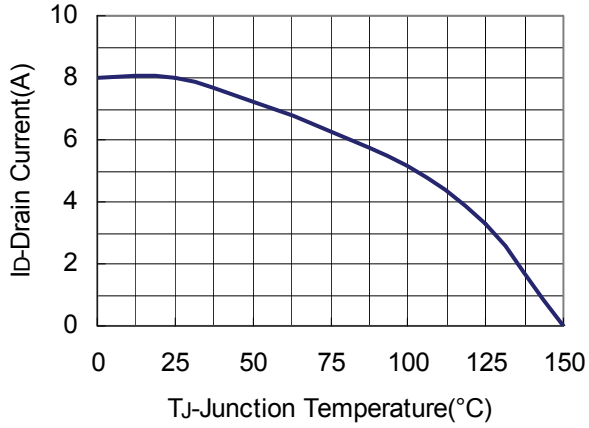
Capacitance



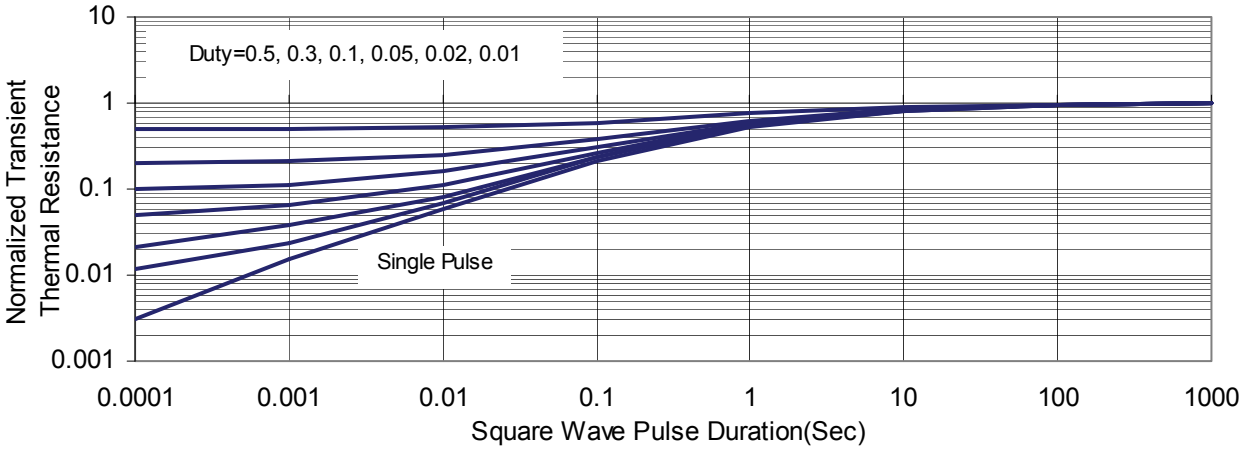
Power Dissipation



Drain Current

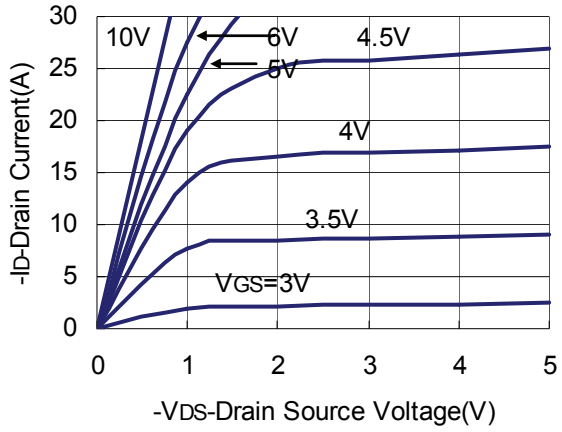


Thermal Transient Impedance

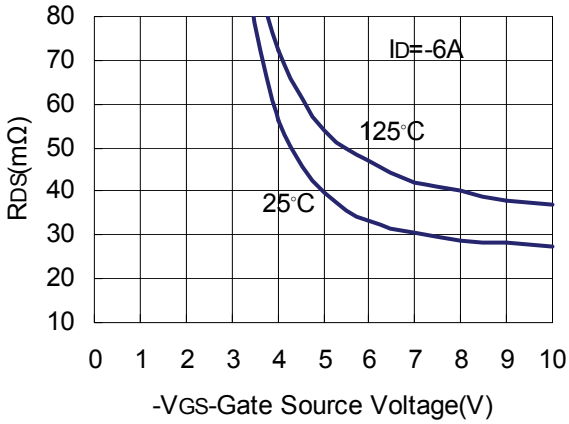


TYPICAL CHARACTERISTICS(P-Channel)

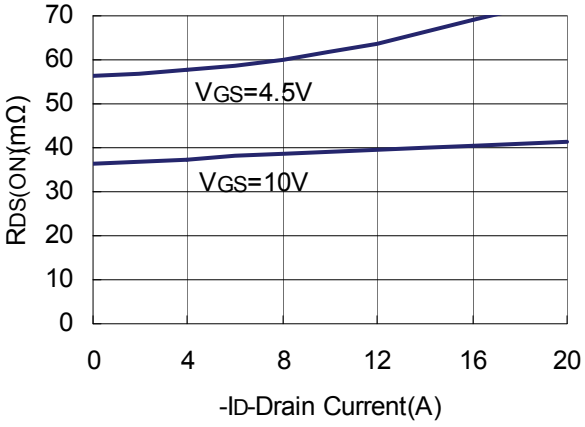
Output Characteristics



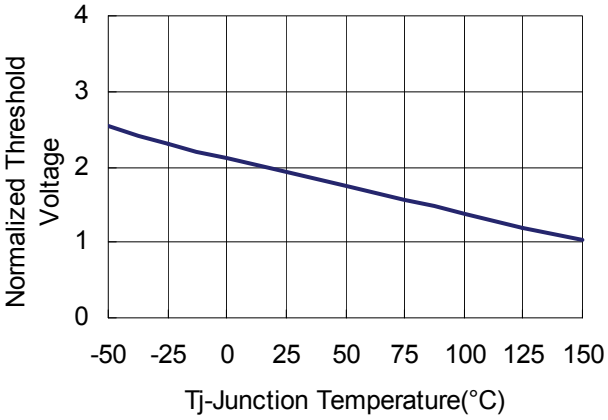
Drain-Source On Resistance



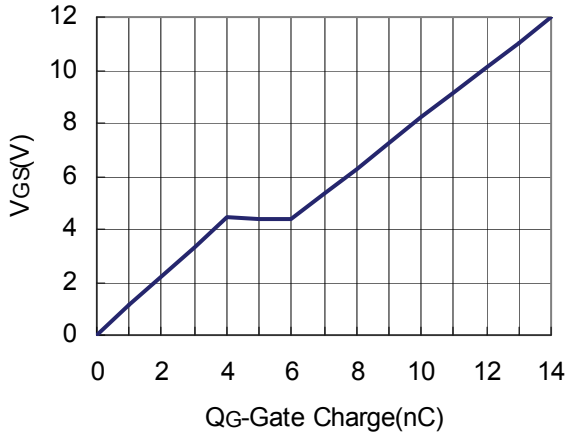
Drain Source On Resistance



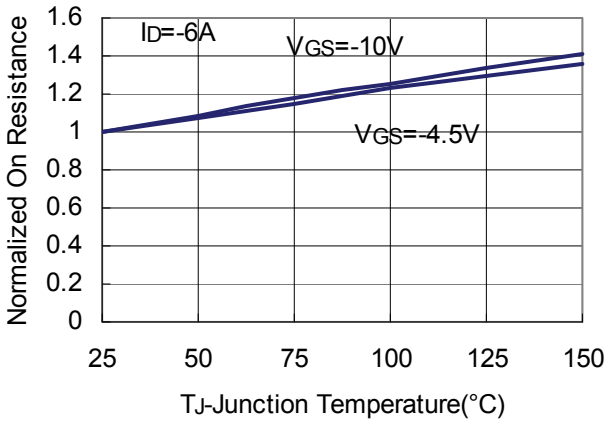
Gate Threshold Voltage



Gate Charge

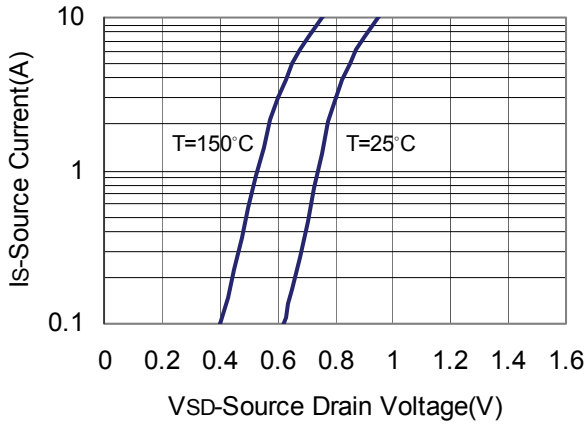


Drain Source On Resistance

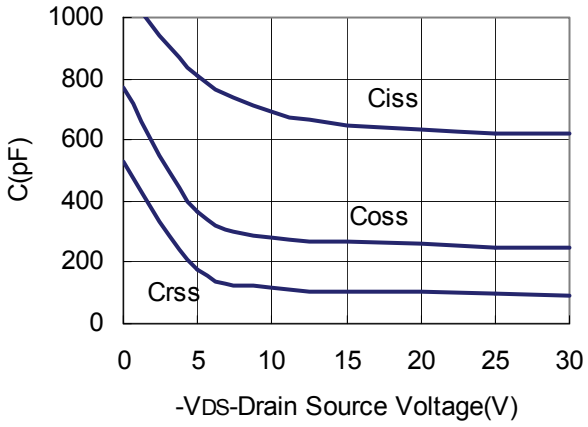


TYPICAL CHARACTERISTICS(P-Channel)

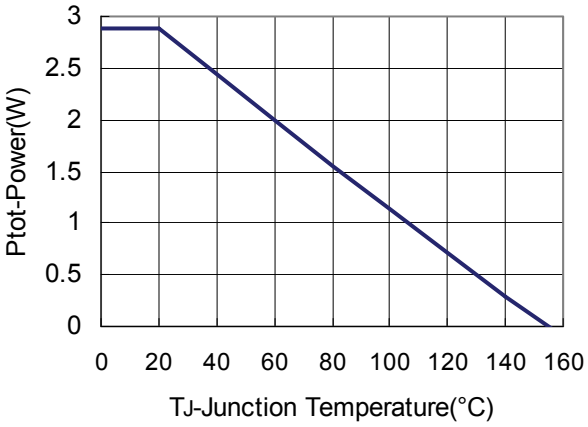
Source Drain Diode Forward



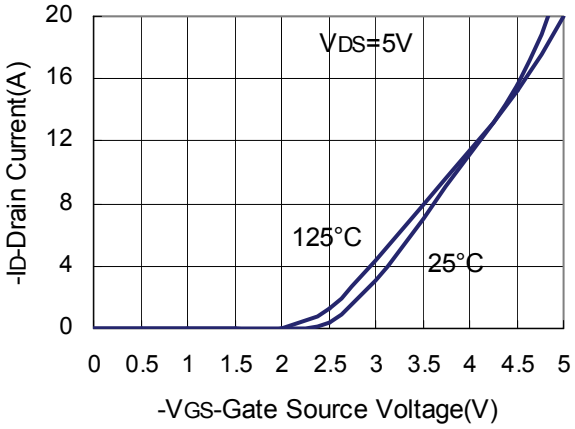
Capacitance



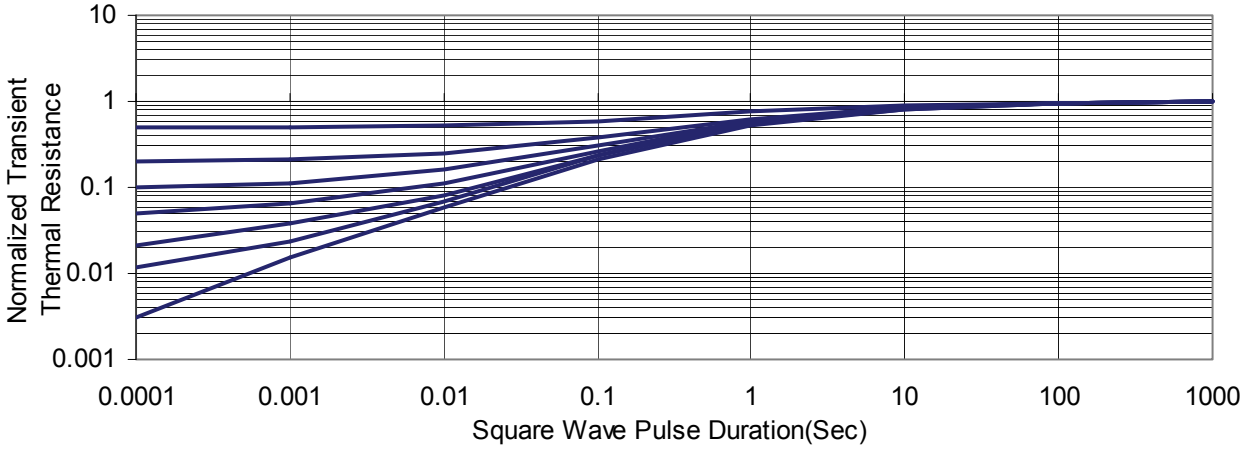
Power Dissipation



Drain Current



Thermal Transient Impedance



SOP-8 PACKAGE DIMENSIONS

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.040	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 BSC		0.050 BSC	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°