

650V 7A Power MOSFET

Description

XCH Semiconductor(XCH)has series Multi-EPI Super-Junction power MOSFET platforms for voltage up 500V to 1000 volts, bothwith design service and manufacturing capability, including cell,termination design and simulation.

The GSx07N65E is a Low voltage N channel Multi-EPI Super-Junction power MOSFET sample with advanced technology to have better characteristics, such as fast switchingtime. low Ciss and Crss. low on resistance and excell entavalanche characteristics.

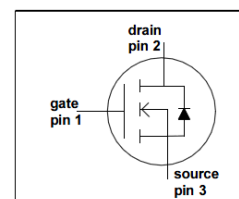


TO-252

Features

$R_{DS(ON)}=0.7\Omega$ @ $V_{GS} = 10V$

$V_{DS} = 650V$



Absolute Maximum Ratings (TC = 25°C, unless otherwise specified)

Symbol	Parameter	GSD07N65E	Unit
V_{DSS}	Drain-Source Voltage	650	V
I_D	Drain Current -Continuous (TC = 25°C) -Continuous (TC = 100°C)	7* 4*	A
I_{DM}	Drain Current - Pulsed	42	A
V_{GSS}	Gate-Source voltage	± 30	V
E_{AS}	Single Pulsed Avalanche Energy	86	mJ
I_{AR}	Avalanche Current	1.7	A
E_{AR}	Repetitive Avalanche Energy	0.42	mJ
dv/dt	Peak Diode Recovery dv/dt	15	V/ns
dV_{ds}/dt	Drain Source voltage slope ($V_{ds}=480V$)	50	V/ns
P_D	Power Dissipation (TC = 25°C)	35	W
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	°C
T_L	Max. Lead Temperature for Soldering Purpose, 1/8" from Case for 5 Seconds	265	°C

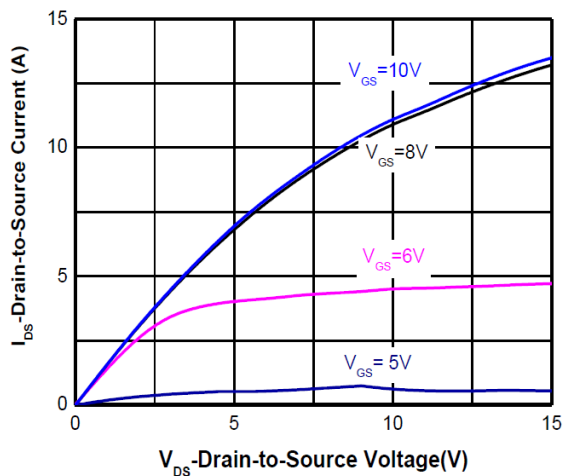
■ Thermal Characteristics

Symbol	Parameter	GSD07N65E	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	3.2	$^{\circ}\text{C}/\text{W}$
$R_{\theta CS}$	Thermal Resistance, Case-to-Sink Typ.	0.8	$^{\circ}\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62	$^{\circ}\text{C}/\text{W}$

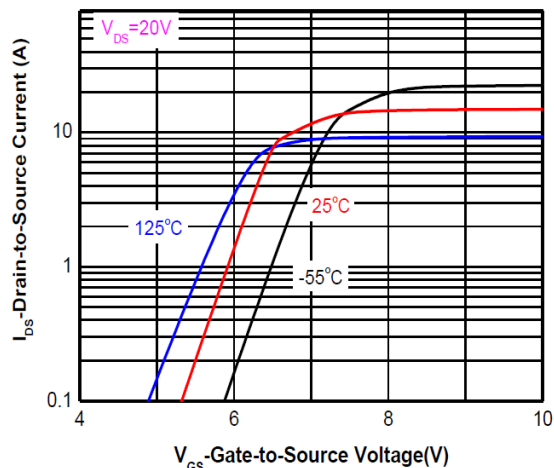
■ Electrical Characteristics (T_J=25 $^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA, T _J = 25°C	600	--	--	V
		V _{GS} = 0V, I _D = 250μA, T _J = 150°C	--	650	--	V
ΔBV _{DSS} /ΔT _J	Breakdown Voltage Temperature Coefficient	I _D = 250μA, Referenced to 25°C	--	0.6	--	V/°C
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 650V, V _{GS} = 0V -T _J = 150°C	--	-- 10	1 -	μA μA
I _{GSSF}	Gate-Body Leakage Current, Forward	V _{GS} = 30V, V _{DS} = 0V	--	--	100	nA
I _{GSSR}	Gate-Body Leakage Current, Reverse	V _{GS} = -30V, V _{DS} = 0V	--	--	-100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	2.5	--	4.5	V
R _{DS(on)}	Static Drain-Source On-Resistance	V _{GS} = 10V, I _D = 3.5A	--	0.6	0.7	Ω
g _{FS}	Forward Transconductance	V _{DS} = 40V, I _D = 3.5A	--	16	--	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} = 25V, V _{GS} = 0V, f = 1.0MHz	--	400	-	pF
C _{oss}	Output Capacitance		--	113	-	pF
C _{rss}	Reverse Transfer Capacitance		--	6.4	--	pF
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DD} = 400V, I _D = 3.5A R _G = 20Ω	--	25	--	ns
t _r	Turn-On Rise Time		--	55	--	ns
t _{d(off)}	Turn-Off Delay Time		--	110	--	ns
t _f	Turn-Off Fall Time		--	9	--	ns
Q _g	Total Gate Charge	V _{DS} = 400V, I _D = 3.5A V _{GS} = 10V	--	10.3	--	nC
Q _{gs}	Gate-Source Charge		--	4.4	--	nC
Q _{gd}	Gate-Drain Charge		--	2.9	--	nC
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain-Source Diode Forward Current		--	--	7	A
I _{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	18	A
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} = 0V, I _S = 3.5A	--	0.9	1.5	V
t _{rr}	Reverse Recovery Time	V _{GS} = 0V, I _S = 3.5A dI _F /dt = 100A/μs	--	190	--	ns
Q _{rr}	Reverse Recovery Charge		--	2.3	--	μC

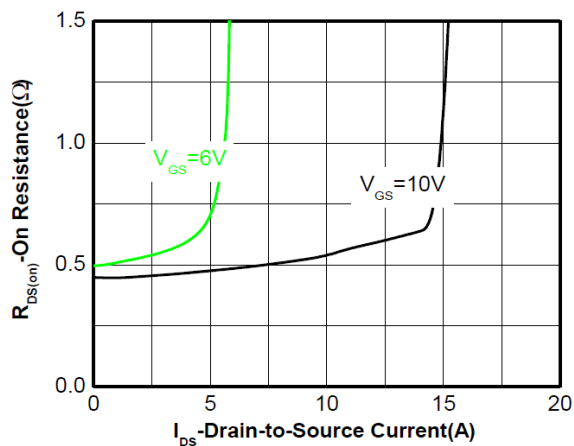
Typical Performance Characteristics



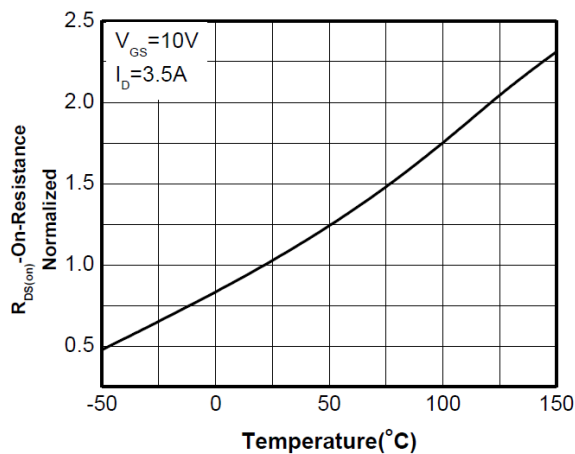
Output characteristics



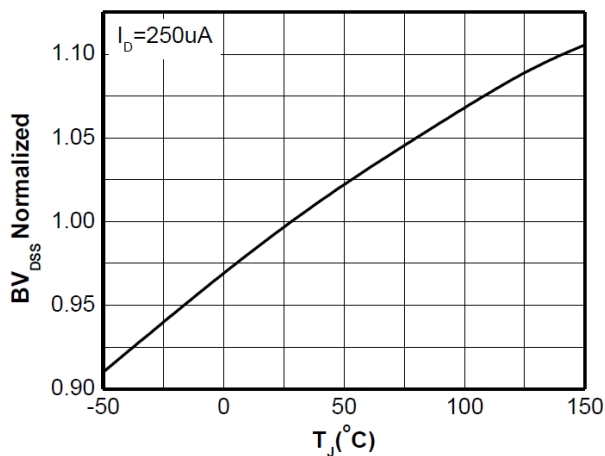
Transfer characteristics



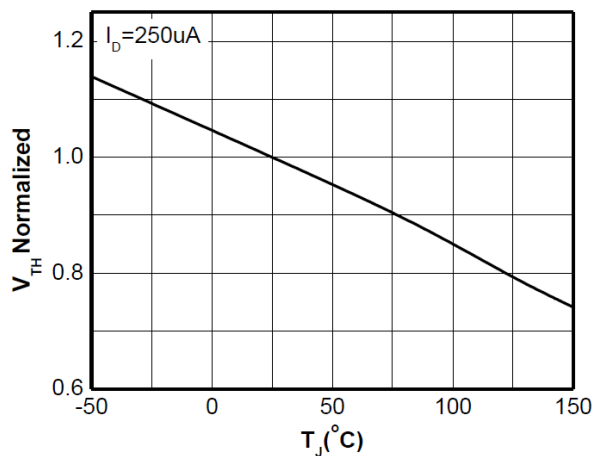
On-Resistance vs. Drain current



On-Resistance vs. Junction temperature

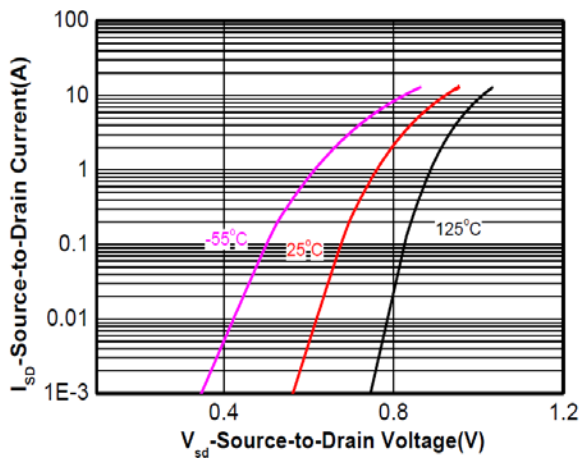


Breakdown Voltage vs. Junction temperature

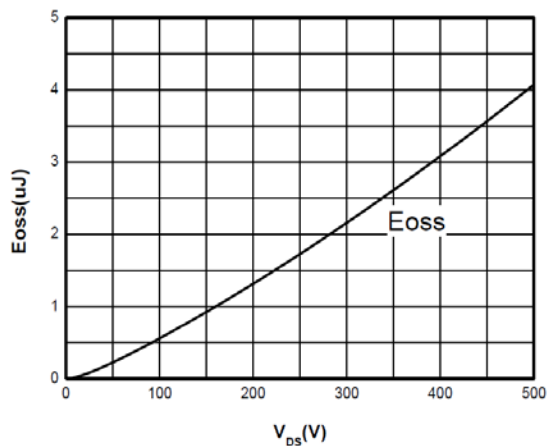


Threshold voltage vs. Junction temperature

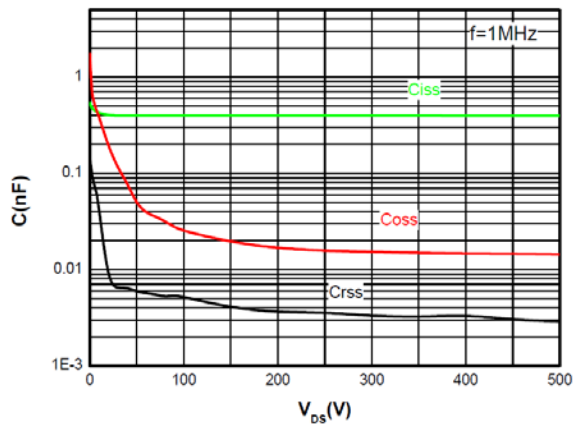
Typical Performance Characteristics



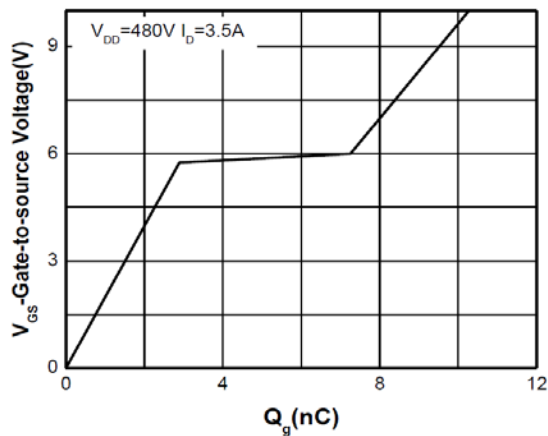
Body diode forward voltage



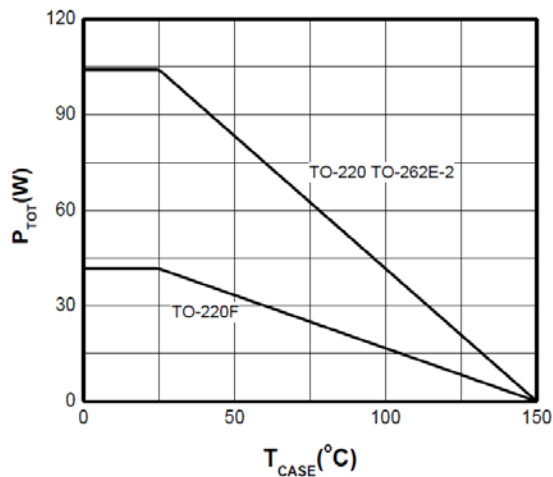
Coss stored Energy



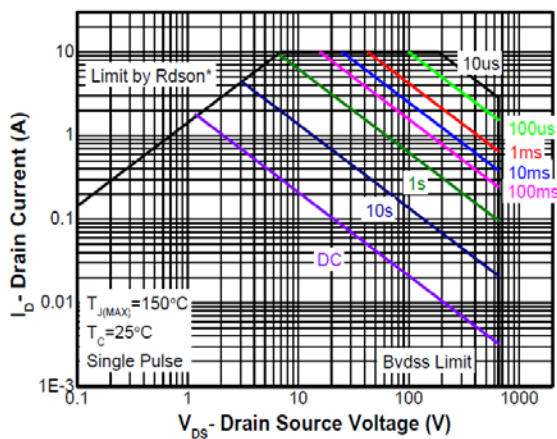
Capacitance



Gate charge Characteristics

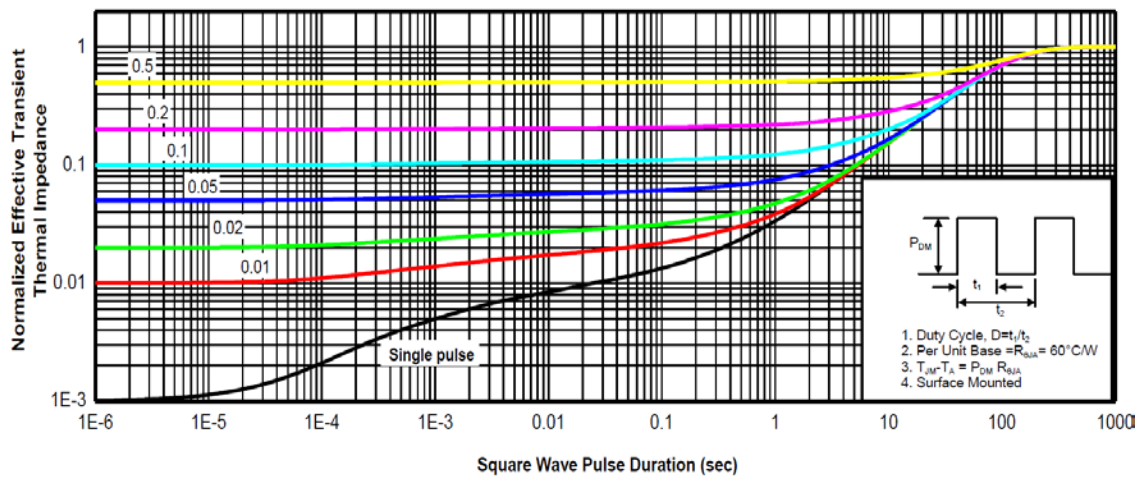


Power dissipation



Safe Operating Area

Typical Performance Characteristics



Transient thermal response (Junction-to-Ambient)