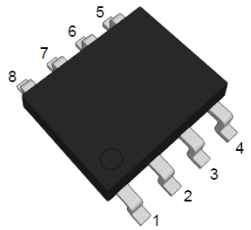
40V N+P Channel MOSFET

DESCRIPTION：

·Advanced Trench Technology
·100% Avalanche Tested
·RoHS and Reach Compliant
·Halogen and Antimony Free
·Moisture Sensitivity Level 3

TYPICAL APPLICATIONS：
·Power Management

V_{DS}	40V	-40V
I_D	8A	-7A
$R_{DS(ON)_MAX}$ @V_{GS}=±10V	19mΩ	35mΩ



SOP-8

ABSOLUTE MAXIMUM RATINGS (at T_C = 25 °C, unless otherwise specified)

Characteristic	Symbol	N MOS	P MOS	Unit
Gate-Source Voltage	V_{GS}	±20	±20	V
Drain-Source Voltage	V_{DS}	30	-40	V
Drain Current-Continuous	I_D	8	-7	A
Pulsed Drain Current (1)	I_{DM}	40	-30	A
Maximum Power Dissipation	P_D	2		W
Junction Temperature	T_J	150		℃
Storage Temperature Range	T_{STG}	-55 ~ +150		℃
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	62.5		℃/W

Notes： 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

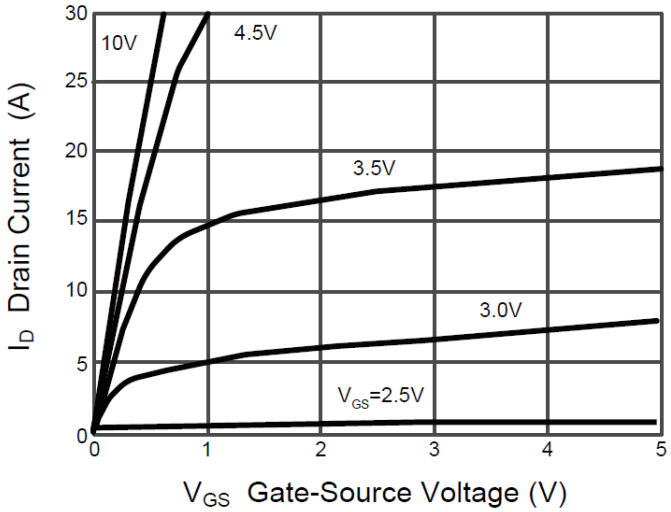
ELECTRICAL CHARATERISTICS (at T_J = 25 °C, unless otherwise specified) -N-Channel

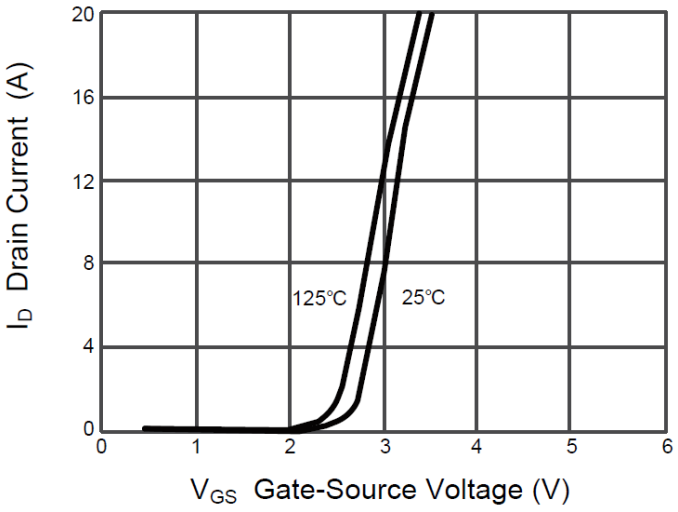
Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage VGS = 0V, ID = 250uA	$V_{(BR)DSS}$	40			V
Zero Gate Voltage Drain Current VDS = 40 V, VGS = 0 V	I_{DSS}			1	uA
Gate-Source Leakage Current VGS = ±20V, VDS = 0V	I_{GSS}			±100	nA
Gate-Source threshold voltage VDS = VGS, ID = 250uA	$V_{GS(th)}$	1	1.5	2	V
Drain-Source On-State Resistance VGS = 10V, ID = 8A, VGS = 4.5V, ID = 4A	$R_{DS(on)}$		14 19	19 29	mΩ
Forward Transconductance VDS = 5 V, ID = 8A	g_{FS}	33			S
Input capacitance f=1MHz, VDS= 20 V, VGS=0 V	C_{iss}		415		pF
Output capacitance f=1MHz, VDS= 20 V, VGS=0 V	C_{oss}		112		pF
Reverse transfer capacitance f=1MHz, VDS= 20 V, VGS=0 V	C_{rss}		11		pF
Total Gate Charge VDS= 20V, ID= 8A,VGS= 10V	Q_G		12		nC
Gate to Source Charge VDS= 20V, ID= 8A,VGS= 10V	Q_{GS}		3.2		nC
Gate to Drain Charge VDS= 20V, ID= 8A,VGS= 10V	Q_{GD}		3.1		nC
Turn-on delay time VDD= 15 V, VGS= 10V, R_L =2.5Ω,R_G =3Ω	td (ON)		4		ns
Rise time VDD= 15 V, VGS= 10V, R_L =2.5Ω,R_G =3Ω	tr		3		ns
Turn-off delay time VDD= 15 V, VGS= 10V, R_L =2.5Ω,R_G =3Ω	td (OFF)		15		ns
Fall time VDD= 15 V, VGS= 10V, R_L =2.5Ω,R_G =3Ω	tf		2		ns
Diode Forward Voltage VGS = 0V, I_S = 8A	V_{SD}		0.8	1.2	V
Diode Forward Current	I_S			8	A

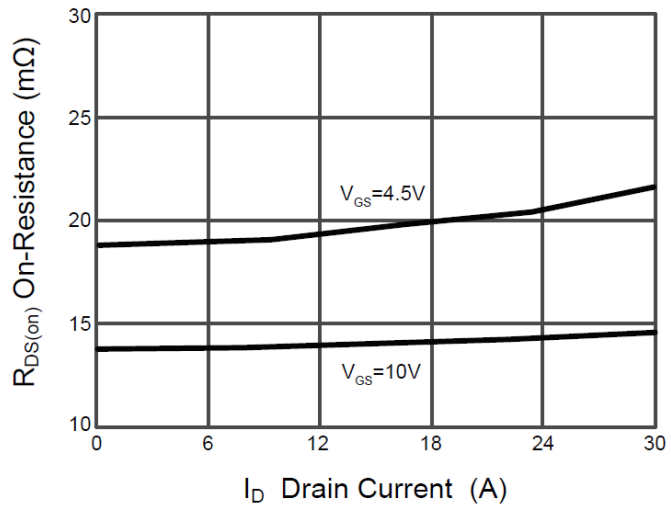
ELECTRICAL CHARATERISTICS (at T_J = 25 °C, unless otherwise specified) -P-Channel

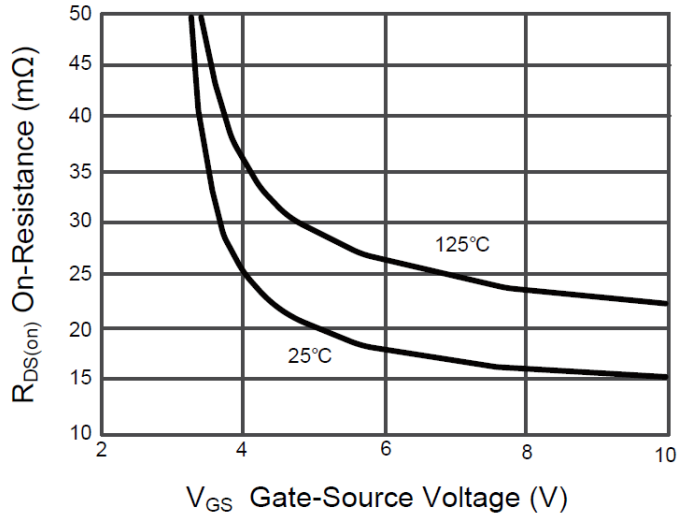
Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage VGS = 0V, ID = -250uA	$V_{(BR)DSS}$	-40			V
Zero Gate Voltage Drain Current VDS = -40 V, VGS = 0 V	I_{DSS}			-1	uA
Gate-Source Leakage Current VGS = ±20V, VDS = 0V	I_{GSS}			±100	nA
Gate-Source threshold voltage VDS = VGS, ID = -250uA	$V_{GS(th)}$	-1	-1.5	-2	V
Drain-Source On-State Resistance VGS = -10V, ID = -8A, VGS = -4.5V, ID = -4A,	$R_{DS(on)}$		29 34	35 45	mΩ
Forward Transconductance VDS = -5 V, ID = -8A	g_{FS}	10			S
Input capacitance f=1MHz, VDS= -20 V, VGS=0 V	C_{iss}		520		pF
Output capacitance f=1MHz, VDS= -20 V, VGS=0 V	C_{oss}		100		pF
Reverse transfer capacitance f=1MHz, VDS= -20 V, VGS=0 V	C_{rss}		65		pF
Total Gate Charge VDS= -20V, ID= -8A,VGS= -10V	Q_G		13		nC
Gate to Source Charge VDS= -20V, ID= -8A,VGS= -10V	Q_{GS}		3.8		nC
Gate to Drain Charge VDS= -20V, ID= -8A,VGS= -10V	Q_{GD}		3.1		nC
Turn-on delay time VDD= -20 V, VGS= -10V, R_L =2.3Ω, R_G =6Ω	td (ON)		7.5		ns
Rise time VDD= -20 V, VGS= -10V, R_L =2.3Ω, R_G =6Ω	tr		5.5		ns
Turn-off delay time VDD= -20 V, VGS= -10V, R_L =2.3Ω, R_G =6Ω	td (OFF)		19		ns
Fall time VDD= -20 V, VGS= -10V, R_L =2.3Ω, R_G =6Ω	tf		7		ns
Diode Forward Voltage VGS = 0V, I_{SD} = -7A	V_{SD}			-1.2	V
Diode Forward Current	I_S			-7	A

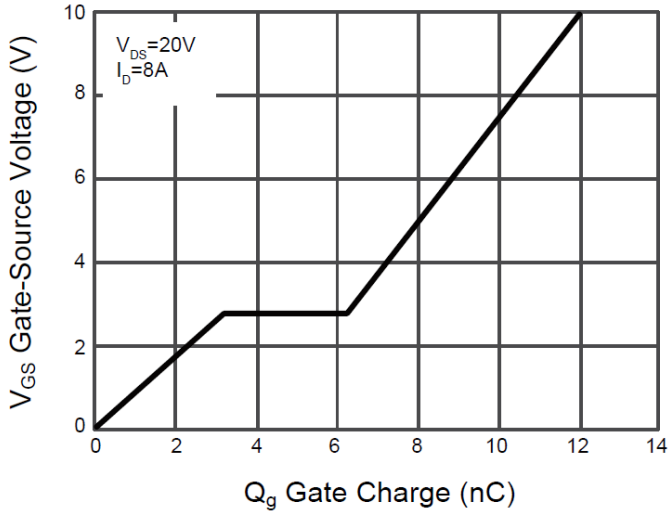
Typical Performance Characteristics- N-Channel

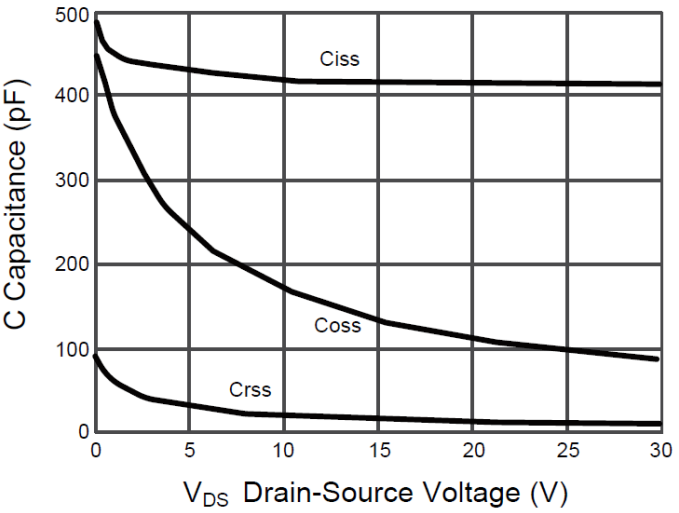




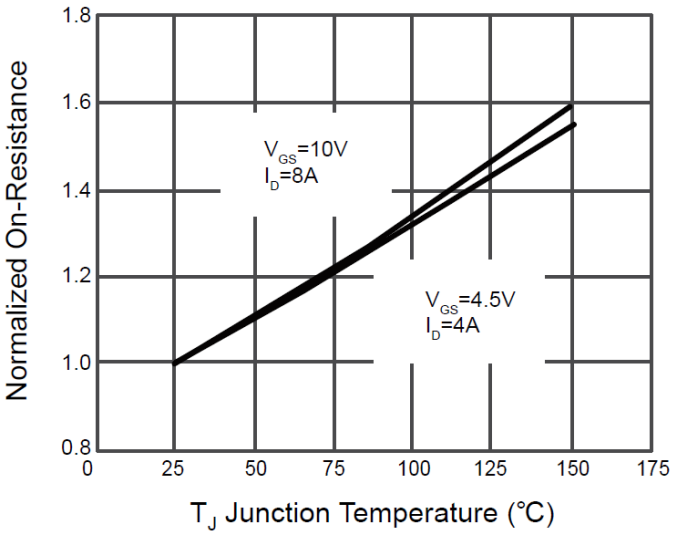


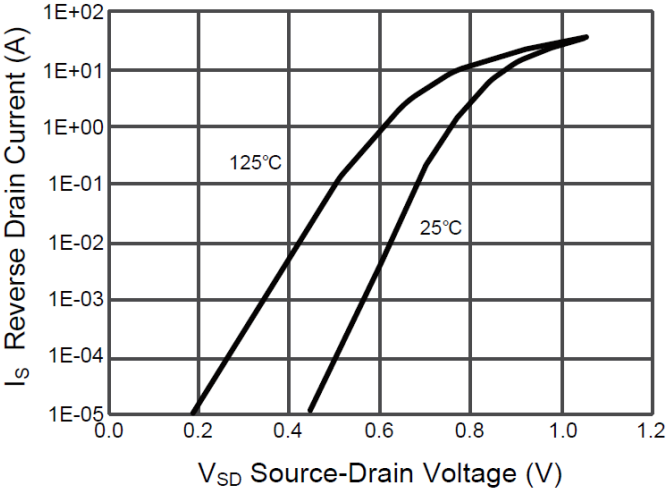


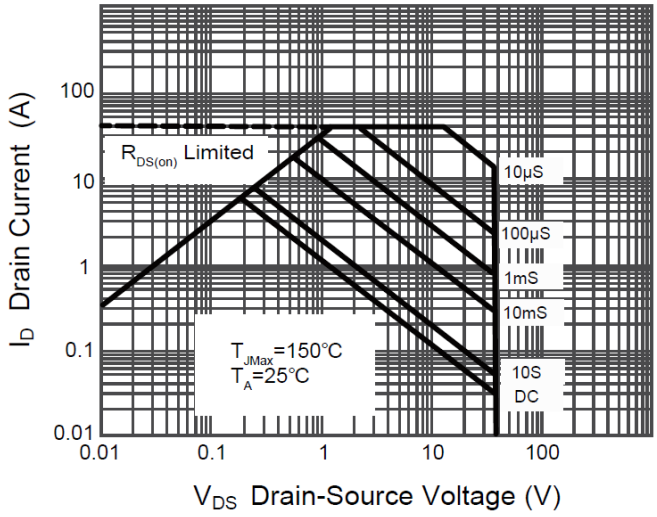


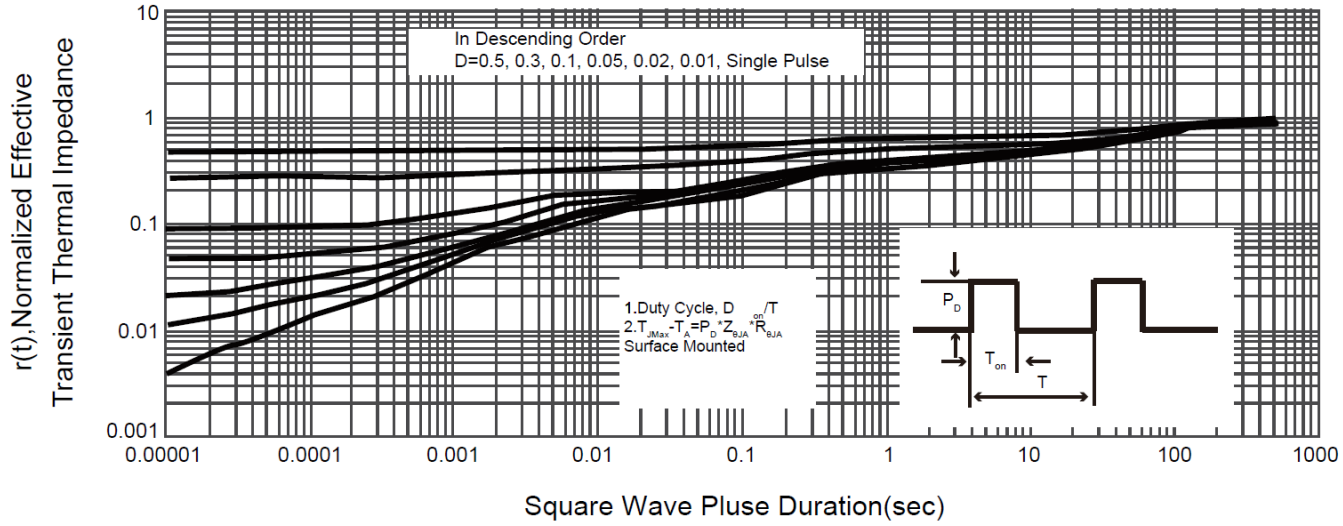


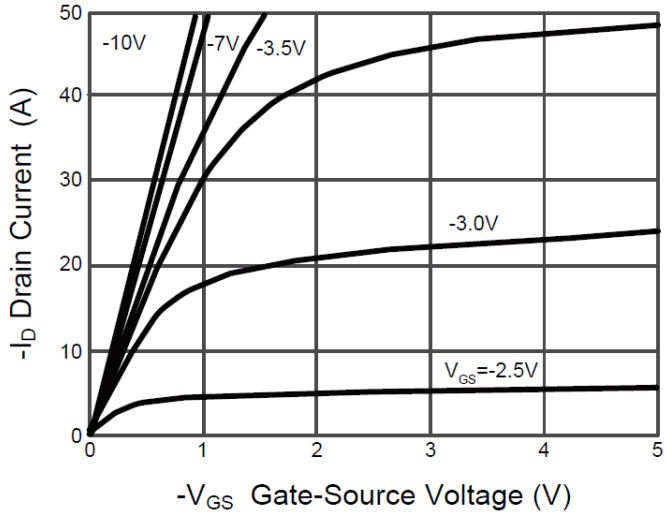
Typical Performance Characteristics- N-Channel

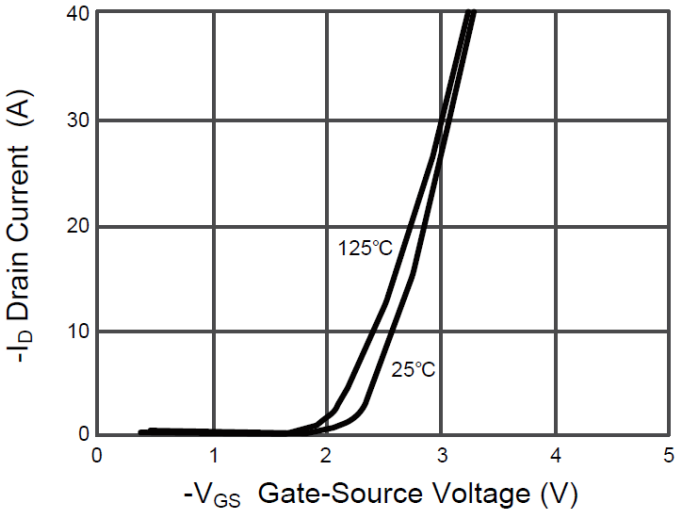


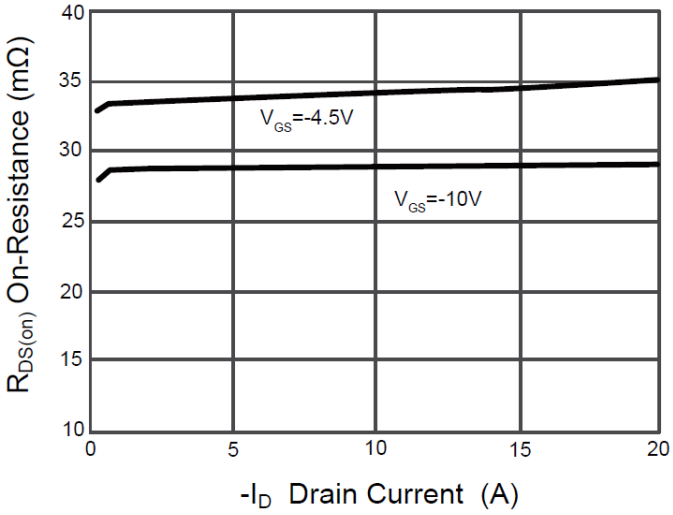


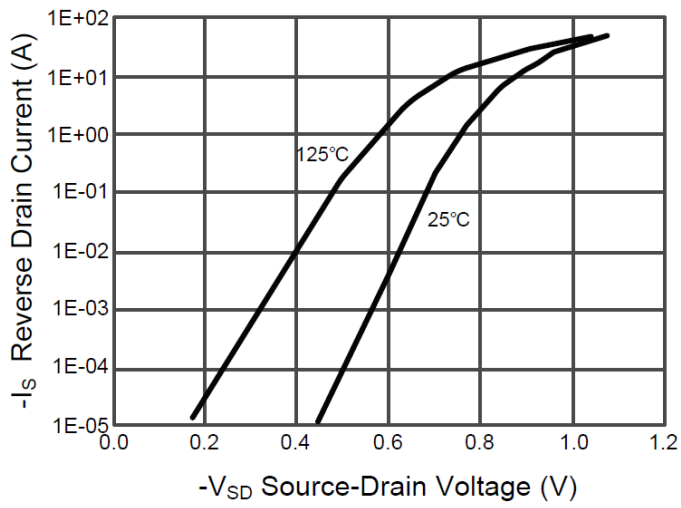


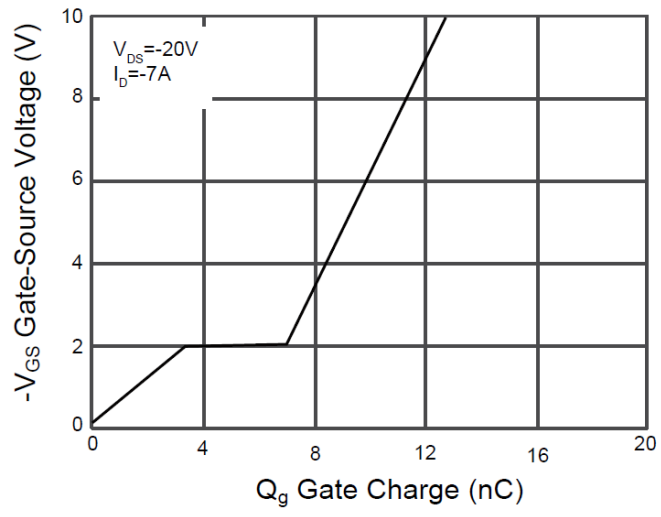


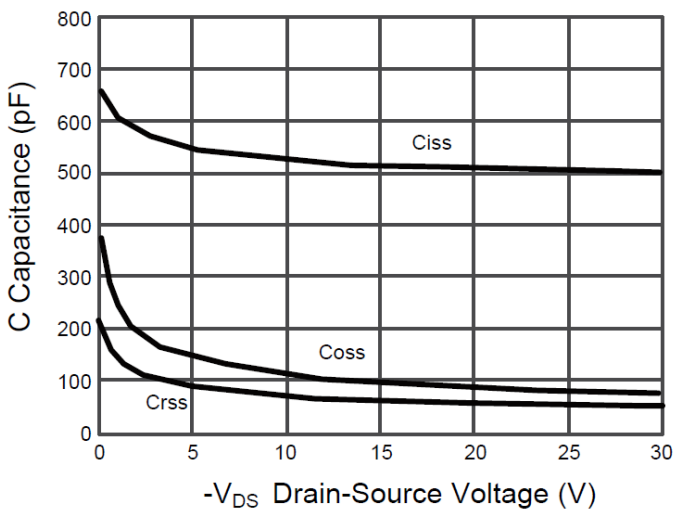

-10V
-7V
-3.5V
-3.0V
V_{GS}=-2.5V
$-I_D$ Drain Current (A)
$-V_{GS}$ Gate-Source Voltage (V)

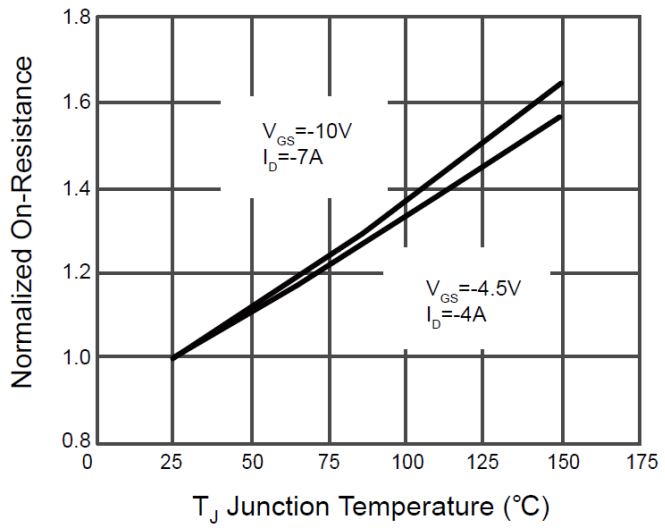

125℃
25℃
$-I_D$ Drain Current (A)
$-V_{GS}$ Gate-Source Voltage (V)

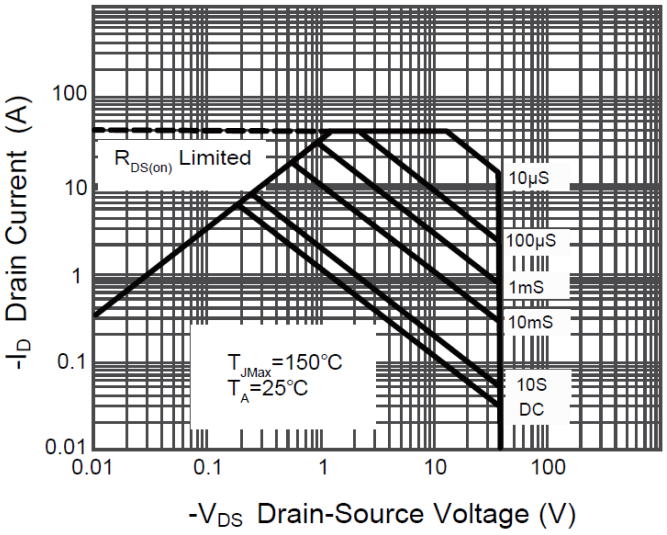

V_{GS}=-4.5V
V_{GS}=-10V
$R_{DS(on)}$ On-Resistance (mΩ)
$-I_D$ Drain Current (A)

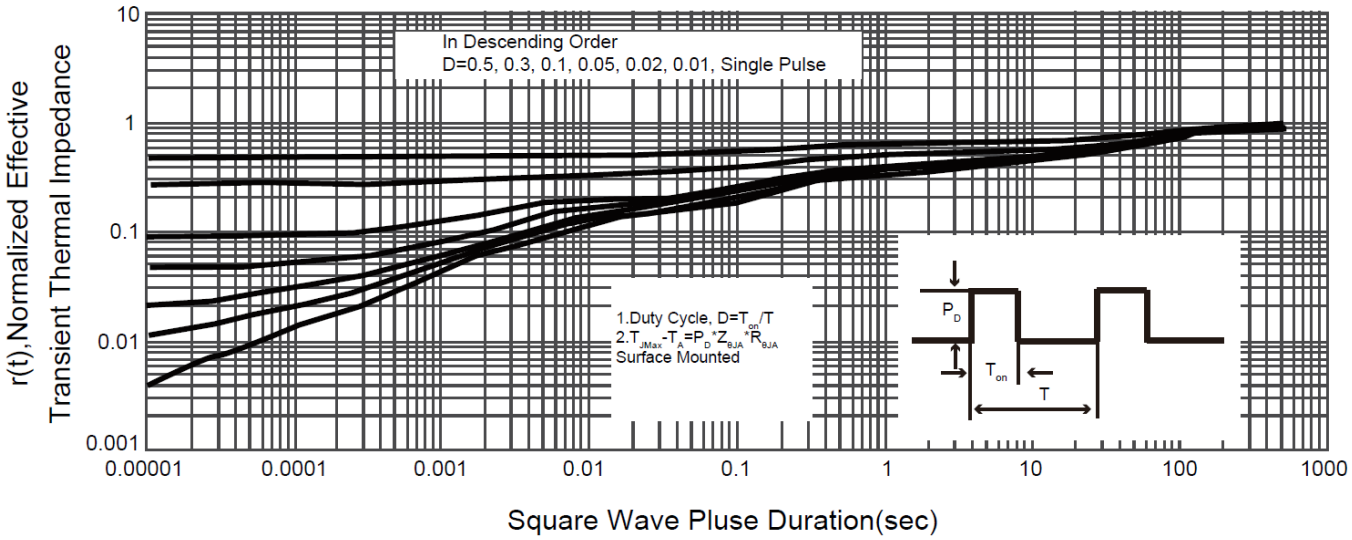

125℃
25℃
$-I_S$ Reverse Drain Current (A)
$-V_{SD}$ Source-Drain Voltage (V)


V_{DS}=-20V
I_D=-7A
$-V_{GS}$ Gate-Source Voltage (V)
Q_g Gate Charge (nC)

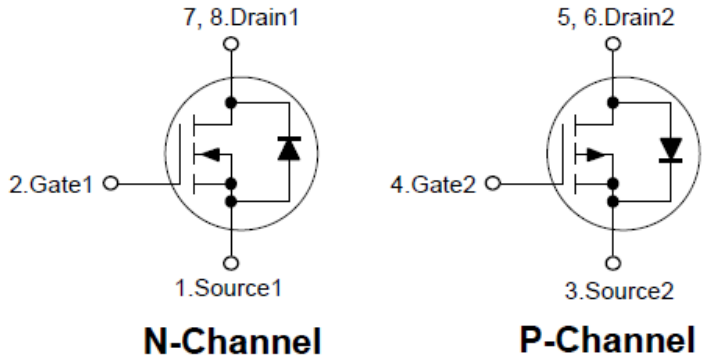

Ciss
Coss
Crss
C Capacitance (pF)
$-V_{DS}$ Drain-Source Voltage (V)


Normalized On-Resistance
1.8
1.6
1.4
1.2
1.0
0.8
0
25
50
75
100
125
150
175
V_{GS}=-10V
I_D=-7A
V_{GS}=-4.5V
I_D=-4A
T_J Junction Temperature (°C)

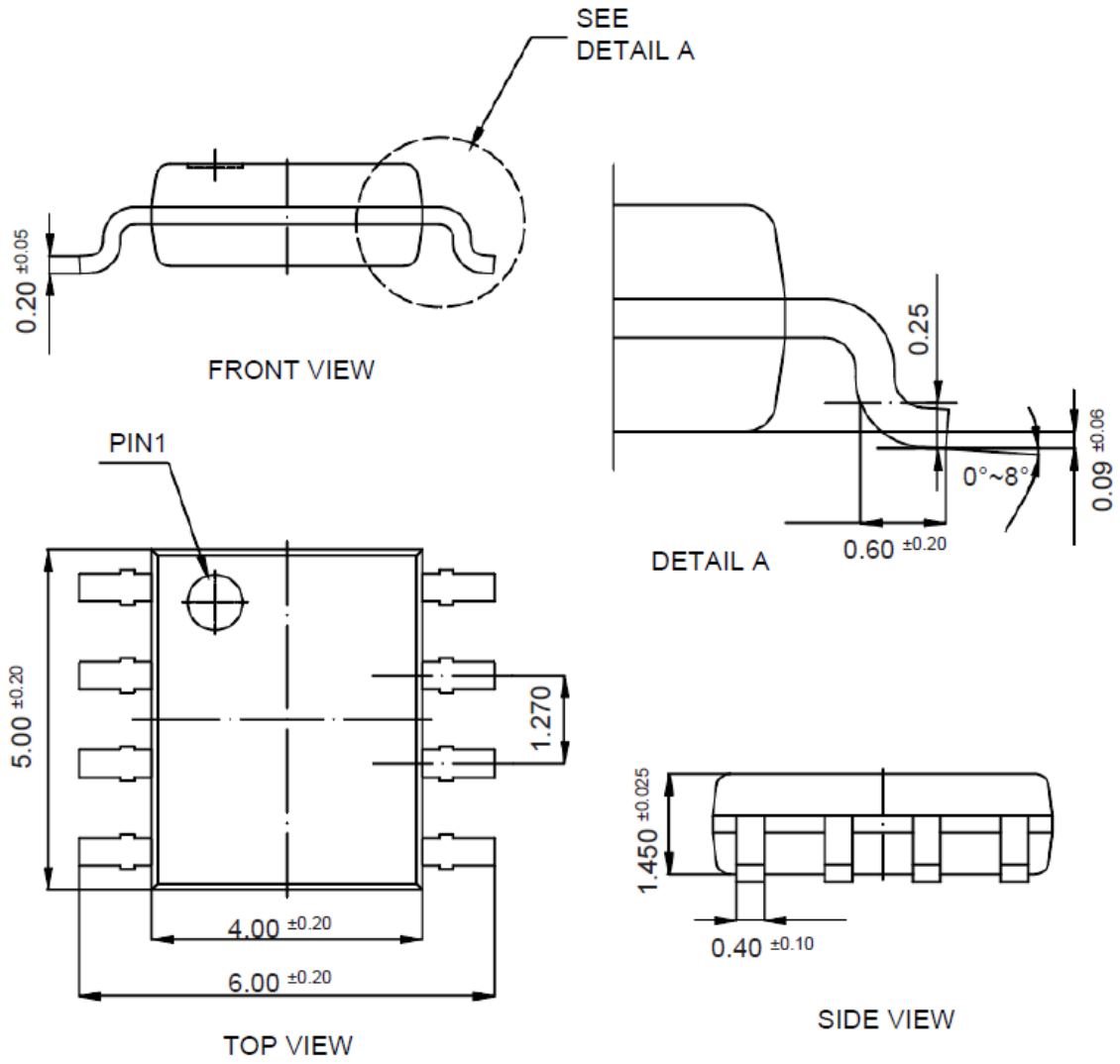

$-I_D$ Drain Current (A)
100
10
1
0.1
0.01
0.01
0.1
1
10
100
$R_{DS(on)}$ Limited
10μS
100μS
1mS
10mS
10S
DC
T_{JMax}=150°C
T_A=25°C
$-V_{DS}$ Drain-Source Voltage (V)


r(t),Normalized Effective Transient Thermal Impedance
10
1
0.1
0.01
0.001
0.00001
0.0001
0.001
0.01
0.1
1
10
100
1000
In Descending Order
D=0.5, 0.3, 0.1, 0.05, 0.02, 0.01, Single Pulse
1.Duty Cycle, D=T_{on}/T
2.T_{JMax}-T_A=P_D*$Z_{\theta JA}$*$R_{\theta JA}$
Surface Mounted
P_D
T_{on}
T
Square Wave Pluse Duration(sec)

·Circuit diagram



·Package outlines : Dimensions in (mm)



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