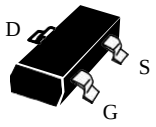
P-Channel High Density Trench MOSFET

Features:

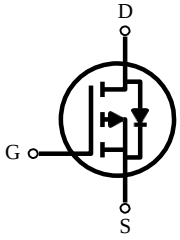
- Super high dense cell trench design for low $R_{DS(on)}$.
- Rugged and reliable.
- Surface Mount package.

SOT-23-3L



PRODUCT SUMMARY

V_{DSS}	I_D	$R_{DS(on)}$ (m-ohm) Max
-100V	-0.8A	650@ V_{GS} = -4.5V
	-0.4A	750@ V_{GS} = -2.5V



ABSOLUTE MAXIMUM RATINGS (T_A = 25 ℃ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	-100	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current-Continuous[a] @ T_A = 25 ℃		I_D	-0.9	A
-Pulse[b]		I_{DM}	-1.8	A
Drain-Source Diode Forward Current[a]		I_S	-0.8	A
Maximum Power Dissipation[a]	T_A=25℃	P_D	1.2	W
	T_A=75℃		0.75	
Operating Junction and Storage Temperature Range		T_J,T_{STG}	- 55 to 150	℃

THERMAL CHARACTERISTICS

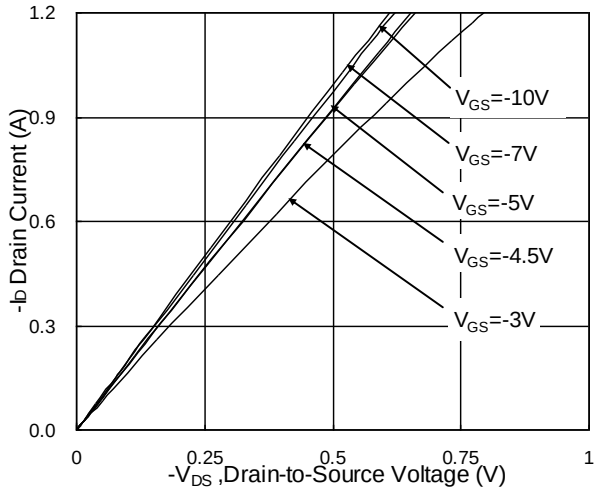
Thermal Resistance,Junction-to-Ambient[a]	R_{thJA}	125	℃/W

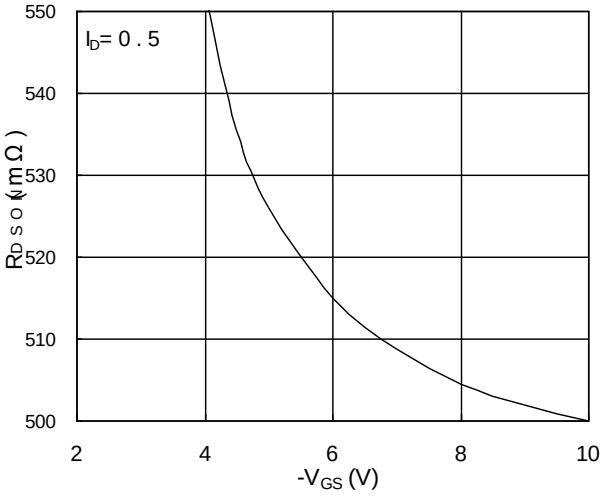
Note
a. Surface Mounted on FR4 Board , t ≤ 10sec .
b. Pulse width limited by maximum junction temperature.

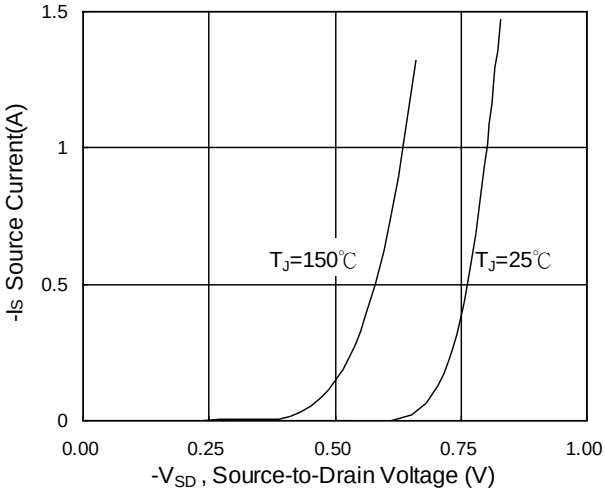
ELECTRICAL CHARACTERISTICS (T_A = 25 ℃ unless otherwise noted)

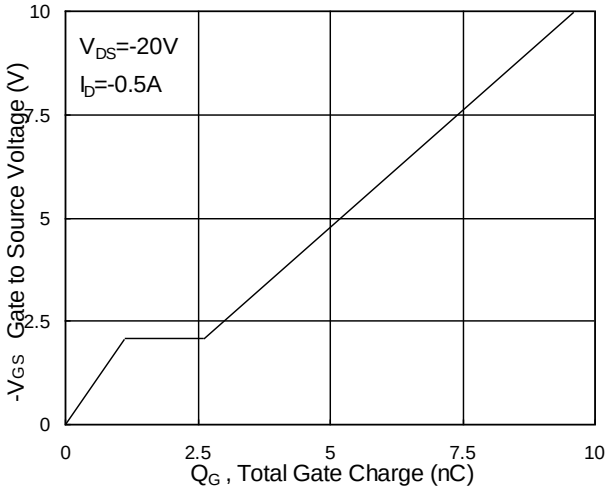
Parameter	Symbol	Condition	Min	Typ[c]	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V , I_D = 250uA	-100			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =- 80V , V_{GS} = 0V			10	uA
Gate-Body Leakage	I_{GSS}	V_{GS} = ±20V,V_{DS} = 0V			±100	nA
ON CHARACTERISTICS[b]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS} , I_D = 250uA	-1	-1.5	-2.5	V
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS} = -10V , I_D =-0.8A		500	650	m-ohm
		V_{GS} = -4.5V , I_D =-0. 4A		540	750	
DRAIN-SOURCE DIODE CHARACTERISTICS[b]						
Diode Forward Voltage	V_{SD}	V_{GS} = 0V , I_S = -1A		-0.75	-1.2	V
DYNAMIC CHARACTERISTICS[c]						
Input Capacitance	C_{ISS}	V_{DS} = -15V , V_{GS} = 0V f = 1.0MHz		553		pF
Output Capacitance	C_{OSS}			29		pF
Reverse Transfer Capacitance	C_{RSS}			20		pF
SWITCHING CHARACTERISTICS[c]						
Turn-On Delay Time	$t_{D(ON)}$	V_{DD} =-50V , I_D = -0.5A V_{GEN} =-10V R_L =1ohm R_{GEN} =3.3 ohm		13.6		ns
Rise Time	t_r			6.8		ns
Turn-Off Delay Time	$t_{D(OFF)}$			34		ns
Fall Time	t_f			3		ns
Total Gate Charge	Q_g	V_{DS} =-15V , I_D =-0.5A V_{GS} =- 4.5V		4.5		nC
Gate-Source Charge	Q_{gs}			1.14		nC
Gate-Drain Charge	Q_{gd}			1.5		nC

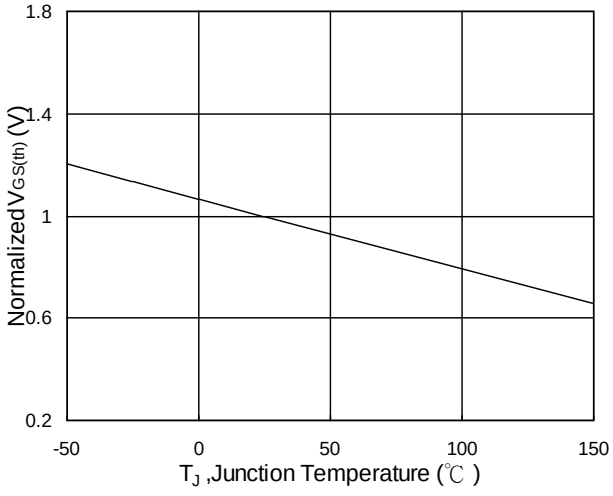
Note
b. Pulse Test Pulse width ≤ 300us , Duty Cycle ≤ 2% .
c. Guaranteed by design , not subject to production testing .

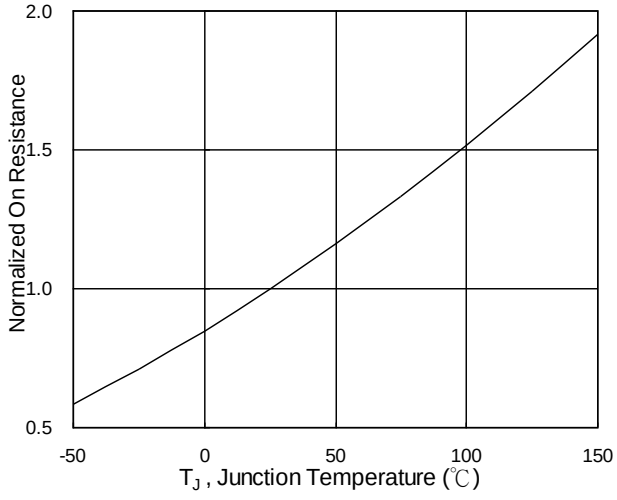

1.2
0.9
0.6
0.3
0.0
-ID Drain Current (A)
VGS=-10V
VGS=-7V
VGS=-5V
VGS=-4.5V
VGS=-3V
0
0.25
0.5
0.75
1
-VDS ,Drain-to-Source Voltage (V)

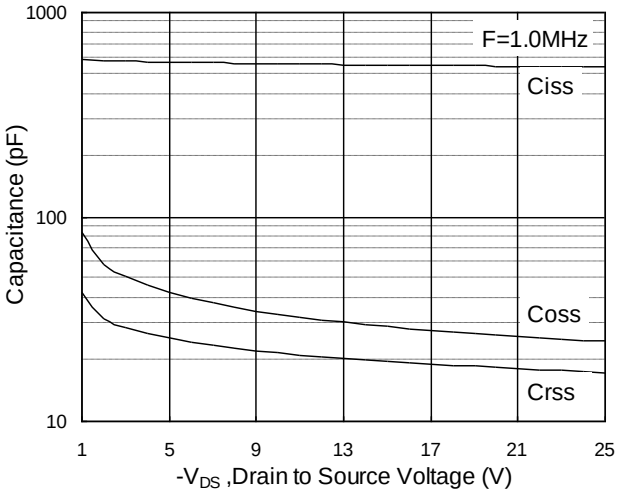

ID= 0 . 5
550
540
530
520
510
500
RDSO(mΩ)
2
4
6
8
10
-VGS (V)

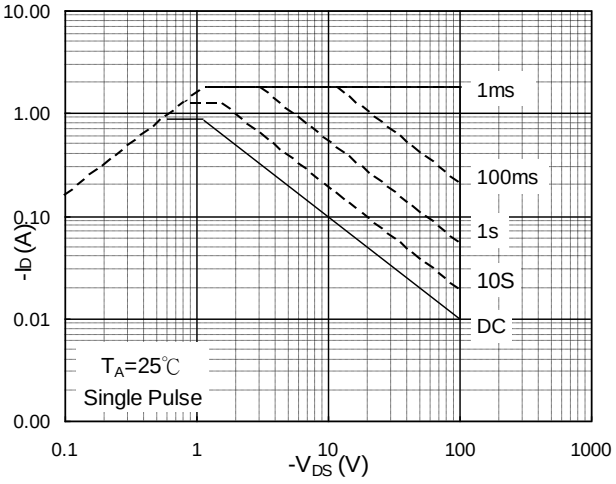

1.5
1
0.5
0
-Is Source Current(A)
TJ=150℃
TJ=25℃
0.00
0.25
0.50
0.75
1.00
-VSD , Source-to-Drain Voltage (V)

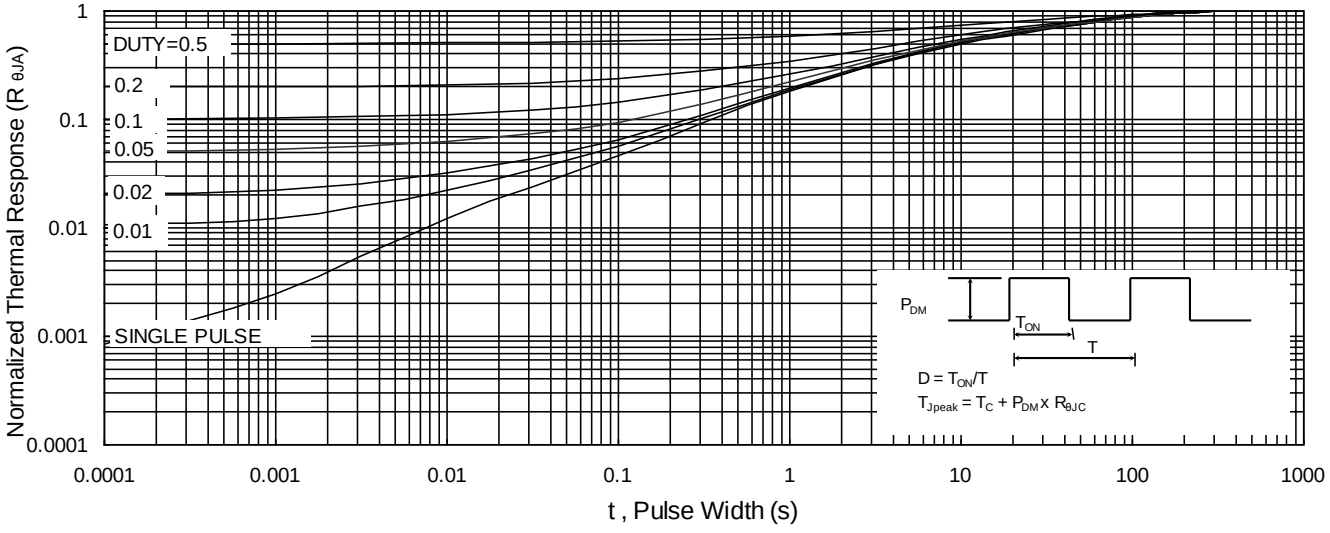

VDS=-20V
ID=-0.5A
10
7.5
5
2.5
0
-VGS Gate to Source Voltage (V)
0
2.5
5
7.5
10
QG , Total Gate Charge (nC)


1.8
1.4
1
0.6
0.2
Normalized VGS(th) (V)
-50
0
50
100
150
TJ ,Junction Temperature (℃)


2.0
1.5
1.0
0.5
Normalized On Resistance
-50
0
50
100
150
TJ , Junction Temperature (℃)


F=1.0MHz
Ciss
Coss
Crss
Capacitance (pF)
-VDS ,Drain to Source Voltage (V)


1ms
100ms
1s
10S
DC
TA=25℃
Single Pulse
-ID (A)
-VDS (V)


DUTY=0.5
0.2
0.1
0.05
0.02
0.01
SINGLE PULSE
PDM
TON
T
D = TON/T
TJpeak = TC + PDM x RθJC
Normalized Thermal Response (RθJA)
t , Pulse Width (s)