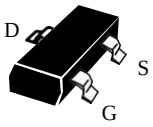
N-Channel High Density Trench MOSFET

Features:

SOT-23



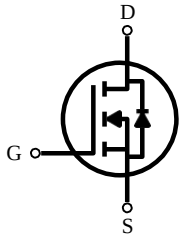
●Super high dense cell trench design for low $R_{DS(on)}$.

●Rugged and reliable.

●Surface Mount package.

PRODUCT SUMMARY

V_{DSS}	I_D	$R_{DS(on)}$ (mΩ) Max
30V	4.6A	65 @ V_{GS} = 10V
	3.8A	78 @ V_{GS} = 5V
	2.8A	85@ V_{GS} = 4.5V



ABSOLUTE MAXIMUM RATINGS (T_A = 25 ℃ unless otherwisenoted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current-Continuous[a] @ T_A = 25 ℃		I_D	4.6	A
-Pulse [b]		I_{DM}	20	A
Drain-Source Diode Forward Current [a]		I_S	2.5	A
Maximum Power Dissipation [a]	T_A=25℃	P_D	1.25	W
	T_A=75℃		0.75	
1. Operating Junction and Storage Temperature Range		T_J,T_{STG}	- 55 to 150	℃

THERMAL CHARACTERISTICS

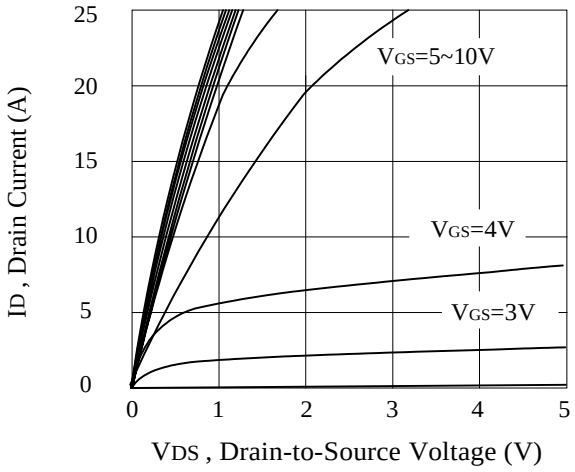
Thermal Resistance,Junction-to-Ambient[a]	R_{thJA}	100	℃/W

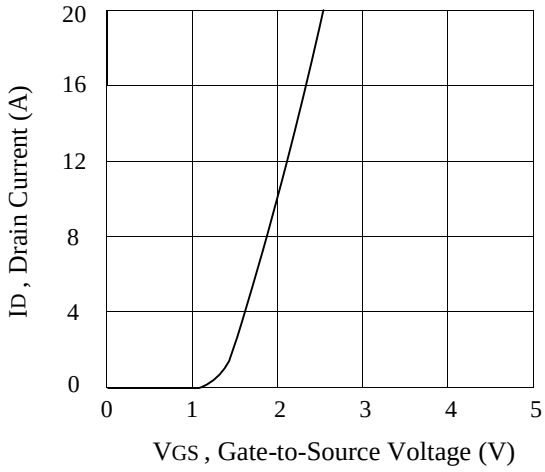
Note：
a. Surface Mounted on FR4 Board , t ≤ 10sec.
b. Pulse width limited by maximum junctiontemperature.

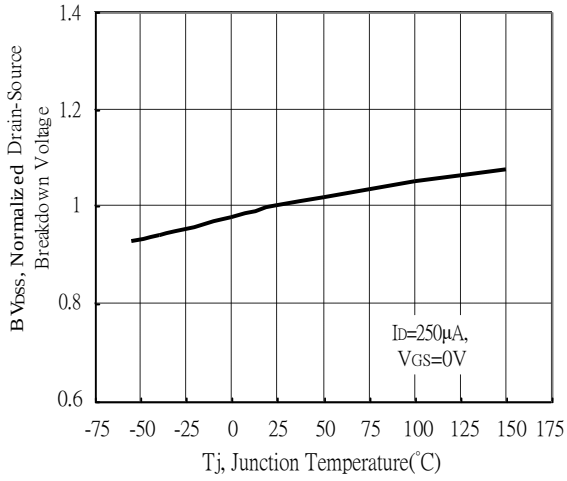
ELECTRICAL CHARACTERISTICS (T_A = 25 ℃ unless otherwise noted)

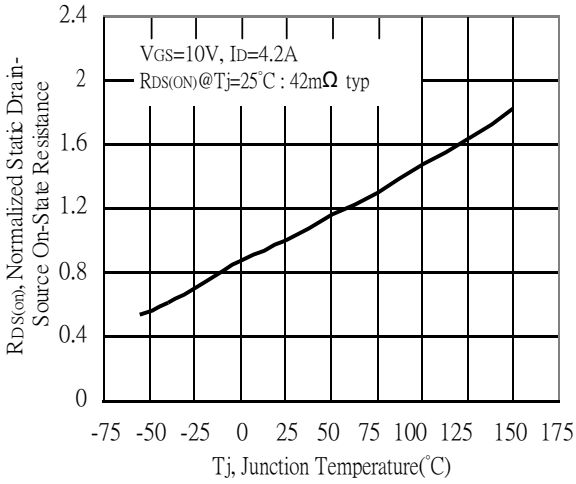
Parameter	Symbol	Condition	Min	Typ[c]	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V , I_D = 250uA	30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 24V , V_{GS} = 0V			1	uA
Gate-Body Leakage	I_{GSS}	V_{GS} = ±12V , V_{DS} = 0V			±100	nA
ON CHARACTERISTICS[b]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS} , I_D = 250uA	1	1.55	2	V
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS} = 10V , I_D = 4.6A		42	65	Ω
		V_{GS} = 5V , I_D = 3.8A		60	78	
		V_{GS} = 4.5V , I_D = 2.8A		68	85	
Forward Transconductance	g_{fs}	V_{DS} = 5V , I_D = 3A		10		S
DRAIN-SOURCE DIODE CHARACTERISTICS[b]						
Diode Forward Voltage	V_{SD}	V_{GS} = 0V , I_S = 1.0A			1.2	V
DYNAMIC CHARACTERISTICS[c]						
Input Capacitance	C_{ISS}	V_{DS} = 15V , V_{GS} = 0V f = 1.0MHz		548		pF
Output Capacitance	C_{OSS}			58		pF
Reverse Transfer Capacitance	C_{RSS}			37		pF
SWITCHING CHARACTERISTICS[c]						
Turn-On Delay Time	$t_{D(ON)}$	V_{DD} = 15V , I_D = 1A V_{GEN} = 10V R_L = 15 Ω R_{GEN} = 6 Ω		6.5		ns
Rise Time	t_r			2		ns
Turn-Off Delay Time	$t_{D(OFF)}$			28.6		ns
Fall Time	t_f			2.6		ns
Total Gate Charge	Q_g	V_{DS} = 15V I_D = 3A V_{GS} = 10V		13.6		nC
Gate-Source Charge	Q_{gs}			2.4		nC
Gate-Drain Charge	Q_{gd}			1.3		nC

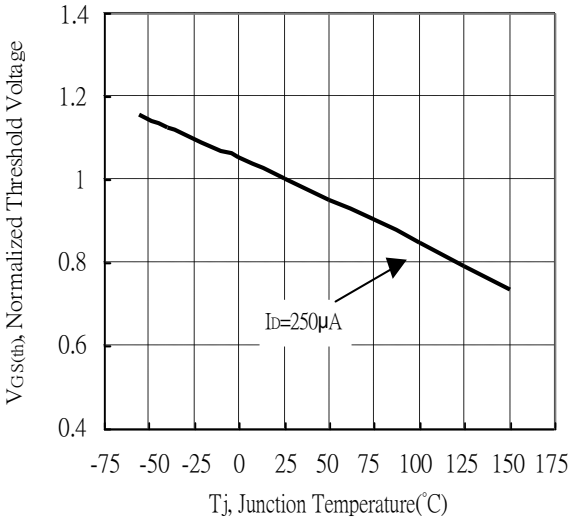
Note：
b. Pulse Test：Pulse width ≤ 300us , Duty Cycle ≤ 2%.
c. Guaranteed by design , not subject to production testing.

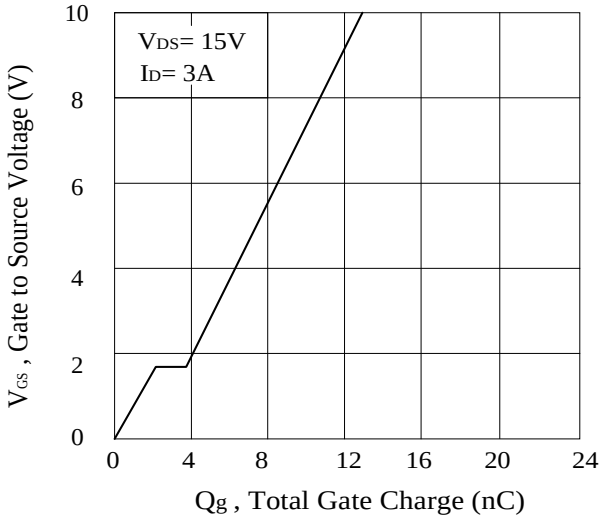

ID , Drain Current (A)
VGS=5~10V
VGS=4V
VGS=3V
VDS , Drain-to-Source Voltage (V)

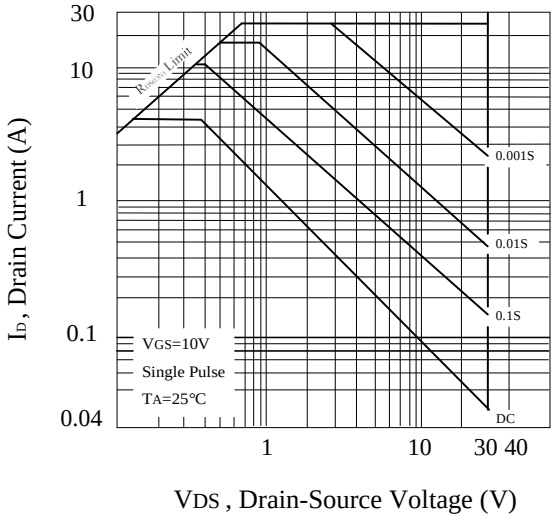

ID , Drain Current (A)
VGS , Gate-to-Source Voltage (V)


BVDSS, Normalized Drain-Source Breakdown Voltage
ID=250μA,
VGS=0V
Tj, Junction Temperature(°C)

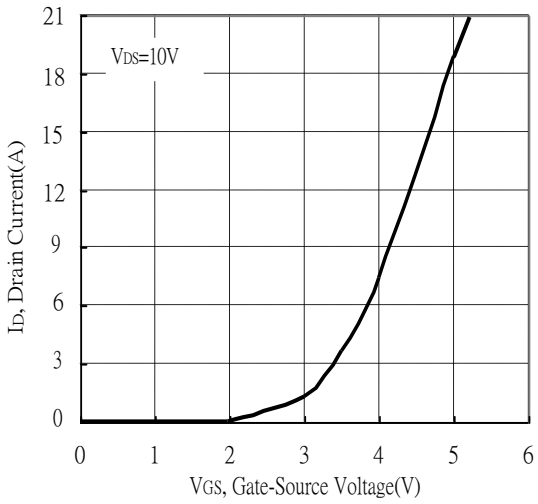

VGS=10V, ID=4.2A
RDS(ON)@Tj=25°C : 42mΩ typ
RDS(ON), Normalized Static Drain-Source On-State Resistance
Tj, Junction Temperature(°C)

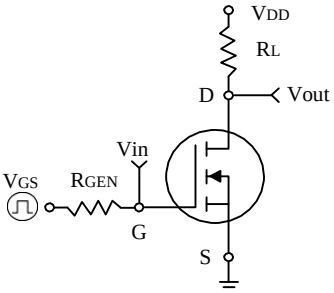

VGS(th), Normalized Threshold Voltage
ID=250μA
Tj, Junction Temperature(°C)

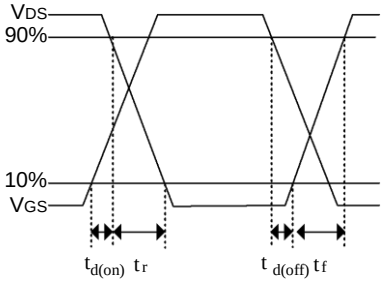

VDS= 15V
ID= 3A
VGS , Gate to Source Voltage (V)
Qg , Total Gate Charge (nC)



Maximum SafeOperating Area

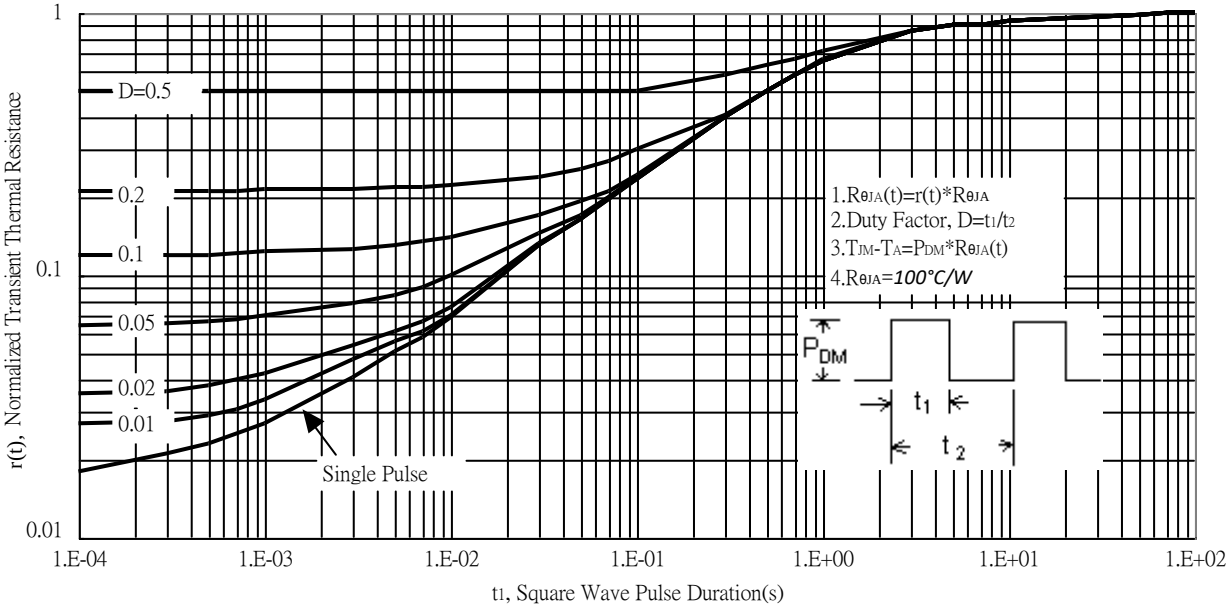




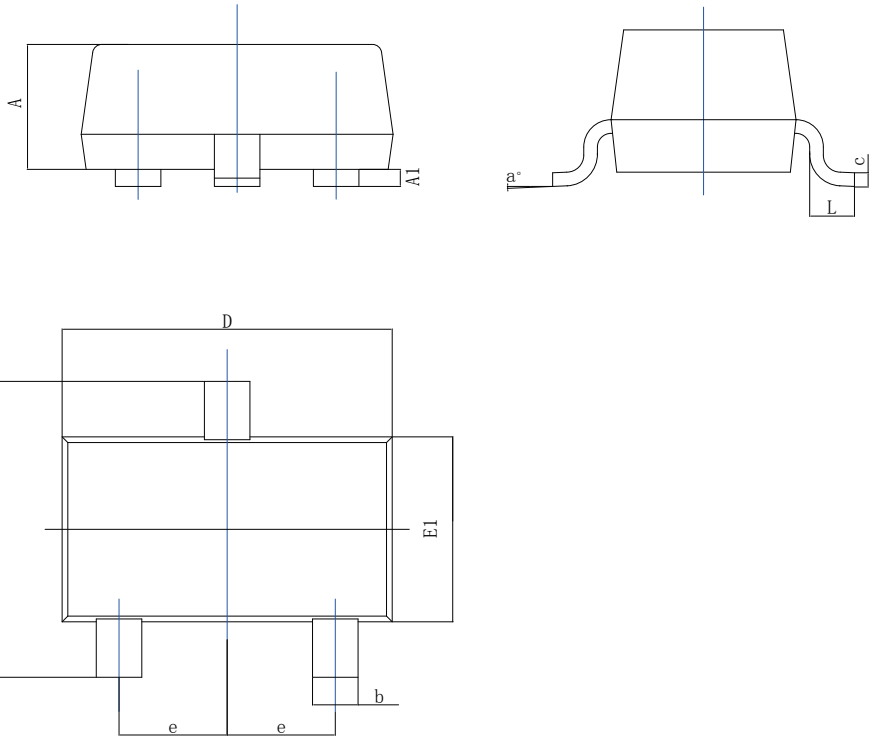


Switching Test Circuit and Switching Waveforms

Transient Thermal Response Curves



SOT-23 Dimension



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	--	--	1.35
A1	0.04	0.07	0.15
b	0.30	0.40	0.50
c	0.08	--	0.21
D	2.72	2.92	3.12
E	2.10	2.33	2.64
E1	1.10	1.30	1.50
e	0.95BSC		
L	0.20	--	0.60
a °	0 °	--	8 °