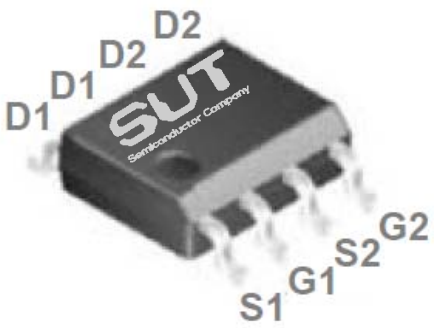
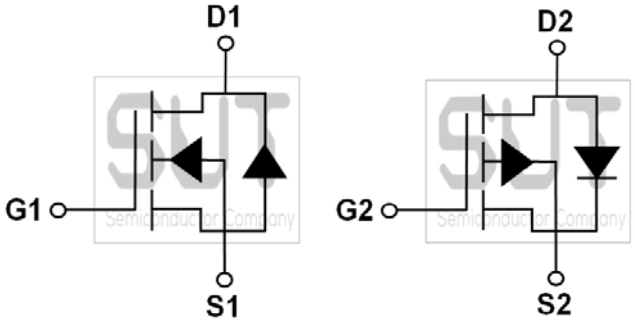
Version 1.0 Date 2019.03.27 Datasheet

N+P Dual Channel 40-$V_{(D-S)}$ MOSFET

PRODUCT SUMMARY		
B_{VDSS}(V)	$R_{DS(on)}$ (mΩ)(MAX)	I_D(A)
40	32@V_{GS}=10V	6.7
-40	40@V_{GS}=-10V	-7.2

Dual SOP8 Pin Configuration





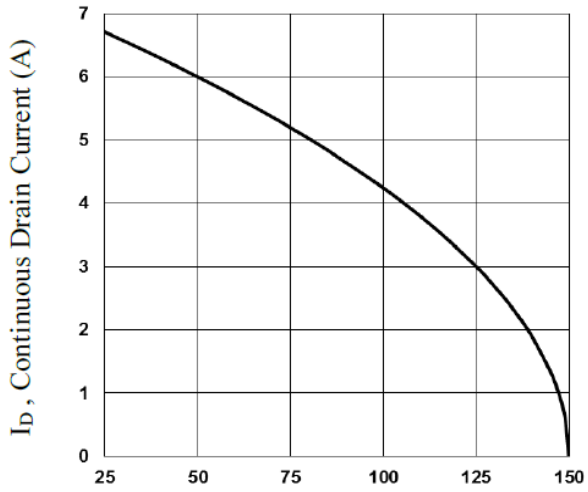
ABSOLUTE MAXIMUM RATINGS(T_C=25℃ UNLESS OTHERWISE NOTED)				
Parameter	Symbol	Rating		Units
Drain-Source Voltage	V_{DS}	40	-40	V
Gate-Source Voltage	V_{GS}	±20	±20	V
Drain Current-Continuous (T_C=25℃)	I_D	6.7	7.2	A
Drain Current-Continuous (T_C=100℃)		4.3	4.5	A
Drain Current-Pulsed[1]	I_{DM}	26.8	28.8	A
Power Dissipation (T_C=25℃)	P_D	2.5		W
Power Dissipation-Derate above 25℃		0.02		W/℃
Storage Temperature Range	T_{STG}	-55 to 150		℃
Operating Junction Temperature Range	T_J	-55 to 150		℃

THERMAL CHARACTERISTICS				
Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction to Case	$R_{\theta JC}$	---	50	℃/W
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	---	62	℃/W

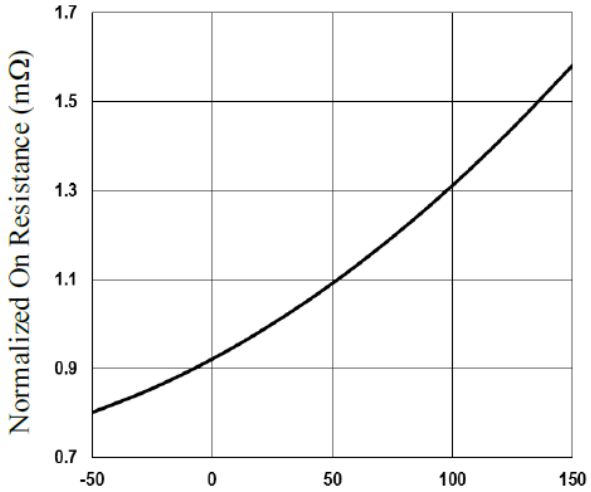
N-CH ELECTRICAL CHARACTERISTICS (T_J=25℃ UNLESS OTHERWISE NOTED)						
Parameter	**Symbol**	**Test Condition**	**Min.**	**Typ.**	**Max.**	**Unit**
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V , I_D=250uA	40	---	---	V
BV_{DSS} Temperature Coefficient	$\triangle BV_{DSS}/\triangle T_J$	Reference to 25℃,I_D=1mA	---	0.04	---	V/℃
Drain-Source Leakage Current	I_{DSS}	V_{GS}=0V,V_{DS}=40V, T_J=25℃	---	---	1	uA
		V_{GS}=0V,V_{DS}=32V,T_J=125℃	---	---	10	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
On Characteristics						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V , I_D=5A	---	24	32	mΩ
		V_{GS}=4.5V , I_D=3A	---	32	45	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D=250uA	1.0	1.8	2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\triangle V_{GS(th)}$		---	-3.0	---	mV/℃
Forward Transconductance	gfs	V_{DS}=10V , I_D=3A	---	3.6	---	S
Dynamic and Switching Characteristics						
Total Gate Charge[2,3]	Q_g	V_{GS}=4.5V , V_{DS}=20V , I_D=3A	---	2.8	5.6	nC
Gate-Source Charge[2,3]	Q_{gs}		---	0.5	1.0	
Gate-Drain Charge[2,3]	Q_{gd}		---	1.5	3.0	
Turn-On Delay Time[2,3]	$T_{d(on)}$	V_{GS}=4.5V , V_{DD}=20V , R_G=25Ω , I_D=1A	---	3.2	6.0	ns
Rise Time[2,3]	T_r		---	8.6	16	
Turn-Off Delay Time[2,3]	$T_{d(off)}$		---	18	36	
Fall Time[2,3]	T_f		---	6.0	12	
Input Capacitance	C_{iss}	V_{GS}=0V , V_{DS}=15V , F=1MHz	---	420	800	pF
Output Capacitance	C_{oss}		---	65	120	
Reverse Transfer Capacitance	C_{rss}		---	40	80	
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	V_G=V_D=0V,Force Current	---	---	6.7	A
Pulsed Source Current	I_{SM}		---	---	13.4	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1.0	V

Note :

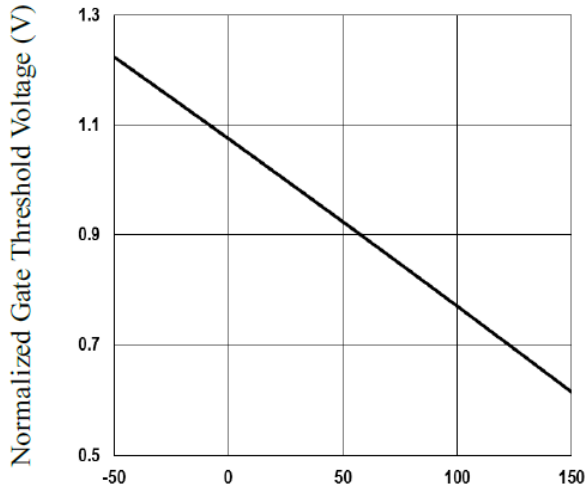
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
3. Essentially independent of operating temperature.



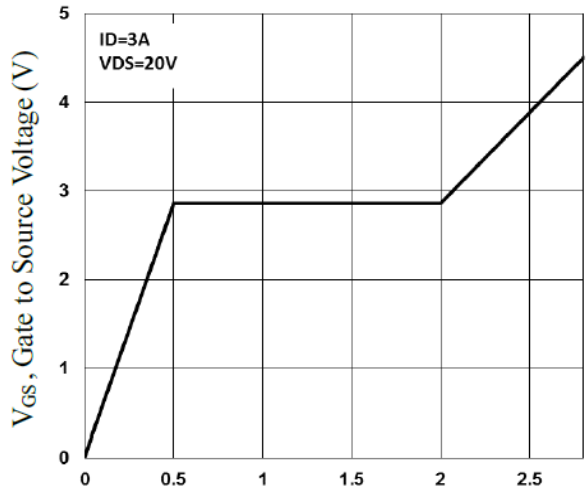
Continuous Drain Current vs. T_C



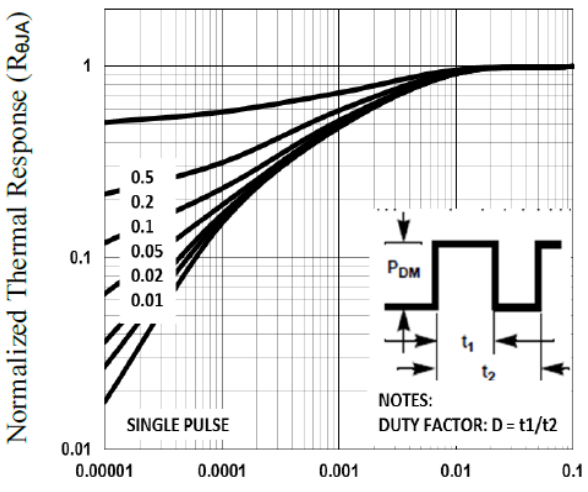
Normalized $R_{DS(ON)}$ vs. T_J



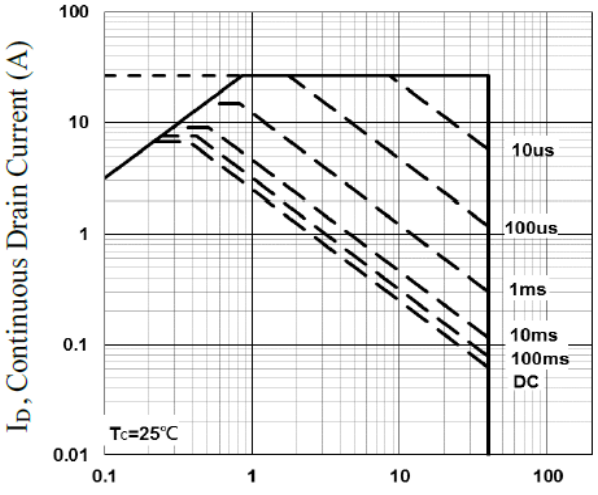
Normalized V_{th} vs. T_J



Gate Charge Waveform



Normalized Transient Impedance

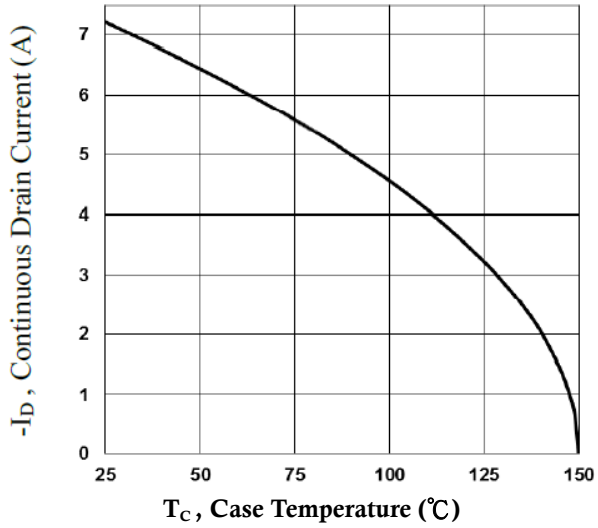


Maximum Safe Operation Area

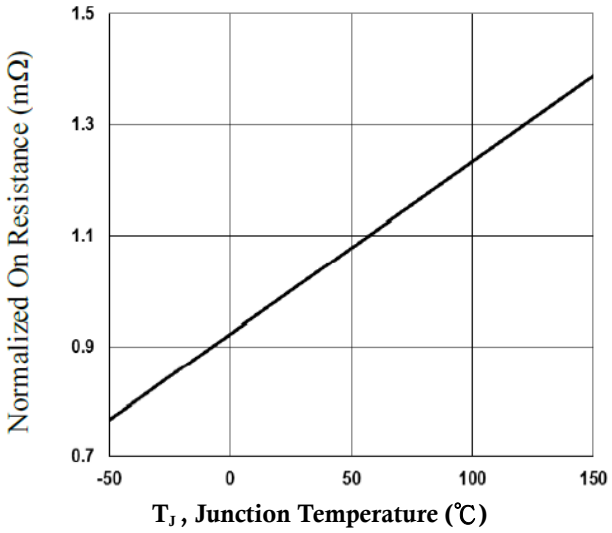
P-CH ELECTRICAL CHARACTERISTICS (T_J=25℃ UNLESS OTHERWISE NOTED)						
Parameter	**Symbol**	**Test Condition**	**Min.**	**Typ.**	**Max.**	**Unit**
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V , I_D=-250uA	-40	---	---	V
BV_{DSS} Temperature Coefficient	$\triangle BV_{DSS}/\triangle T_J$	Reference to 25℃,I_D=-1mA	---	-0.04	---	V/℃
Drain-Source Leakage Current	I_{DSS}	V_{GS}=0V,V_{DS}=-40V,T_J=25℃	---	---	-1	uA
		V_{GS}=0V,V_{DS}=-32V,T_J=125℃	---	---	-10	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±10V , V_{DS}=0V	---	---	±100	nA
On Characteristics						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V , I_D=-4A	---	32	40	mΩ
		V_{GS}=-4.5V , I_D=-2A	---	45	60	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D=-250uA	-1.0	-1.6	-2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\triangle V_{GS(th)}$		---	3.0	---	mV/℃
Forward Transconductance	gfs	V_{DS}=-10V , I_D=-3A	---	5.0	---	S
Dynamic and Switching Characteristics						
Total Gate Charge[2,3]	Q_g	V_{GS}=-4.5V , V_{DS}=-20V , I_D=-2A	---	8.0	16	nC
Gate-Source Charge[2,3]	Q_{gs}		---	2.1	4.2	
Gate-Drain Charge[2,3]	Q_{gd}		---	3.6	7.2	
Turn-On Delay Time[2,3]	$T_{d(on)}$	V_{GS}=-4.5V , V_{DD}=-20V , R_G=25Ω , I_D=-1A	---	20	40	ns
Rise Time[2,3]	T_r		---	12	24	
Turn-Off Delay Time[2,3]	$T_{d(off)}$		---	46	80	
Fall Time[2,3]	T_f		---	6.0	12	
Input Capacitance	C_{iss}	V_{GS}=0V , V_{DS}=-15V , F=1MHz	---	1050	1600	pF
Output Capacitance	C_{oss}		---	110	160	
Reverse Transfer Capacitance	C_{rss}		---	80	120	
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	V_G=V_D=0V,Force Current	---	---	-7.2	A
Pulsed Source Current	I_{SM}		---	---	-14.4	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V , I_S=-1A ,T_J=25℃	---	---	-1.0	V

Note :

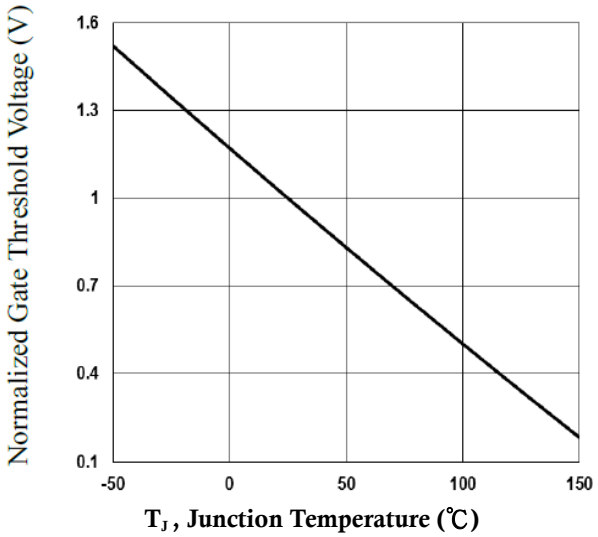
4. Repetitive Rating : Pulsed width limited by maximum junction temperature.
5. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
6. Essentially independent of operating temperature.



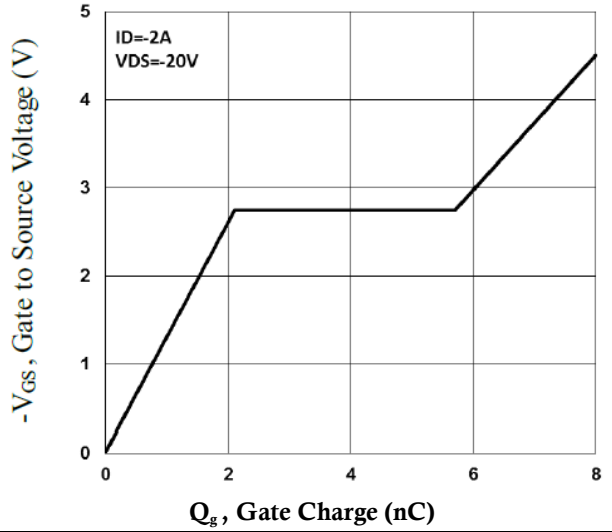
Continuous Drain Current vs. T_C



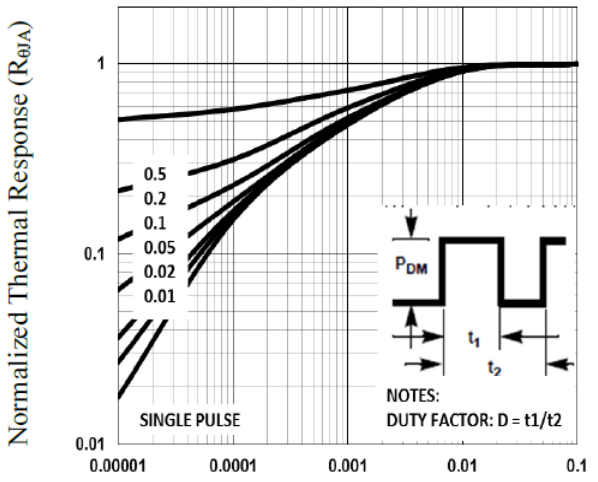
Normalized $R_{DS(ON)}$ vs. T_J



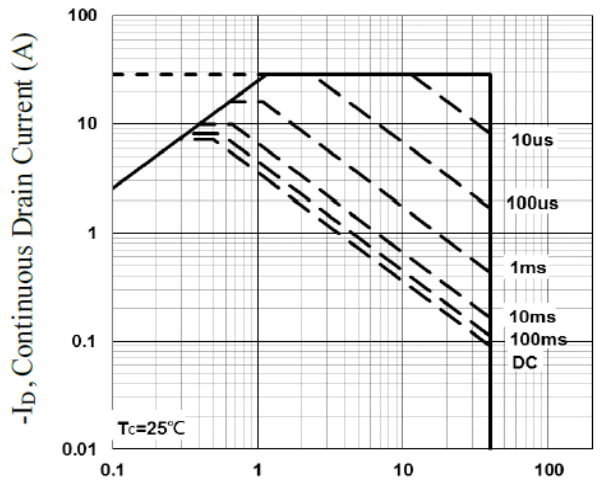
Normalized V_{th} vs. T_J



Gate Charge Waveform

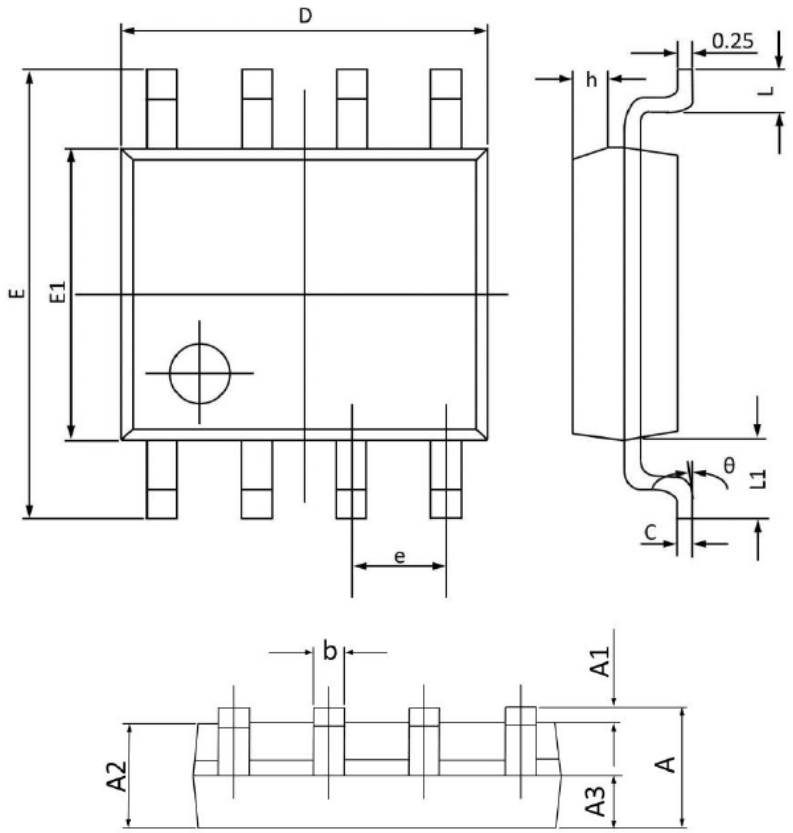


Normalized Transient Impedance



Maximum Safe Operation Area

Dual SOP8 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.750	1.350	0.068	0.053
A1	0.250	0.100	0.009	0.004
A2	1.500	1.300	0.059	0.052
A3	0.700	0.600	0.027	0.024
b	0.480	0.390	0.018	0.016
c	0.260	0.210	0.010	0.009
D	5.100	4.700	0.200	0.186
E	6.200	5.800	0.244	0.229
E1	4.100	3.700	0.161	0.146
e	1.270(BSC)		0.050(BSC)	
h	0.500	0.250	0.019	0.010
L	0.800	0.500	0.031	0.019
L1	1.050(BSC)		0.041(BSC)	
θ	8°	0°	8°	0°