N-Channel 300 V (D-S) MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (mΩ) (Typ.)	I_D (A)[a]	Q_g (Typ.)
300	210 at V_{GS} = 10 V	13	26.5 nC

FEATURES

- DT-Trench Power MOSFET
- 100 % R_g and UIS tested
- Fast Switching
- avalanche tested

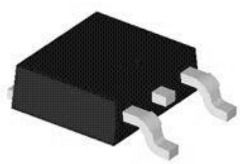
RoHS COMPLIANT

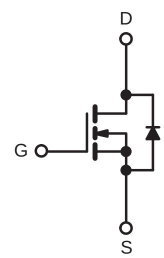
APPLICATIONS

- High frequency switching mode power supply

TO-252 Pin Configuration

Top View





N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_C = 25 °C, unless otherwise noted)				
PARAMETER		SYMBOL	LIMIT	UNIT
Drain-Source Voltage		V_{DS}	300	V
Gate-Source Voltage		V_{GS}	± 30	
Continuous Drain Current (T_J = 150 °C)[a]	T_C = 25 °C	I_D	13	A
	T_C = 100 °C		8.2	
Pulsed Drain Current[b]		I_{DM}	52	
Single Avalanche Energy		E_{AS}	550	mJ
Maximum Power Dissipation[c]	T_C = 25 °C	P_D	115	W
	T_C = 100 °C		46.3	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to +150	°C

THERMAL RESISTANCE RATINGS			
PARAMETER	SYMBOL	LIMIT	UNIT
Junction-to-Ambient (PCB Mount)[d]	R_{thJA}	62	°C/W
Junction-to-Case (Drain)	R_{thJC}	1.08	

Notes

a. Calculated continuous current based on maximum allowablejunction temperature.
b. Repetitive rating; pulse width limited by max. junction temperature.
c. Pd is based on max. junction temperature, using junction-case thermal resistance.
d. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper,in a still air environment with Ta=25 °C.

SPECIFICATIONS (T_C = 25 °C, unless otherwise noted)						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = 250 μA	300	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA	2	-	4	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 30 V	-	-	± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 300 V, V_{GS} = 0 V	-	-	1	μA
		V_{DS} =240 V, V_{GS} = 0 V, T_J = 125 °C	-	-	100	
On-State Drain Current [a]	$I_{D(on)}$	V_{DS} ≥ 5 V, V_{GS} = 10 V	13	-	-	A
Drain-Source On-State Resistance [a]	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 6.5 A	-	210	250	mΩ
Forward Transconductance [a]	g_{fs}	V_{DS} = 5 V, I_D = 6.5 A	-	15	-	S
Dynamic [b]						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	-	1300	-	pF
Output Capacitance	C_{oss}		-	140	-	
Reverse Transfer Capacitance	C_{rss}		-	4.5	-	
Total Gate Charge [c]	Q_g	V_{DS} = 240 V, V_{GS} = 10 V, I_D = 13 A	-	26.5	-	nC
Gate-Source Charge [c]	Q_{gs}		-	8.8	-	
Gate-Drain Charge [c]	Q_{gd}		-	6.5	-	
Gate Resistance	R_g	f = 1 MHz	-	2.3	-	Ω
Turn-On Delay Time [c]	$t_{d(on)}$	V_{DD} = 150 V, I_D = 14 A, R_g = 15 Ω, V_{GS} = 10 V	-	26	-	ns
Rise Time [c]	t_r		-	27.5	-	
Turn-Off Delay Time [c]	$t_{d(off)}$		-	44.5	-	
Fall Time [c]	t_f		-	16	-	
Drain-Source Body Diode Ratings and Characteristics [b] (T_C = 25 °C)						
Continuous Source-Drain Diode Current	I_S	T_C = 25 °C	-	-	13	A
Pulsed Current	I_{SM}		-	-	52	A
Forward Voltage [a]	V_{SD}	I_F = 1 A, V_{GS} = 0 V	-	-	1.2	V
Reverse Recovery Time	t_{rr}	I_F = 13 A, di/dt = 100 A/μs	-	168	-	ns
Reverse Recovery Charge	Q_{rr}		-	1.1	-	μC

Notes

a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.
c. Independent of operating temperature.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

TYPICAL CHARAC TERISTICS (25 °C, unless otherwise noted)

Figure 1 Typical Output Characteristics

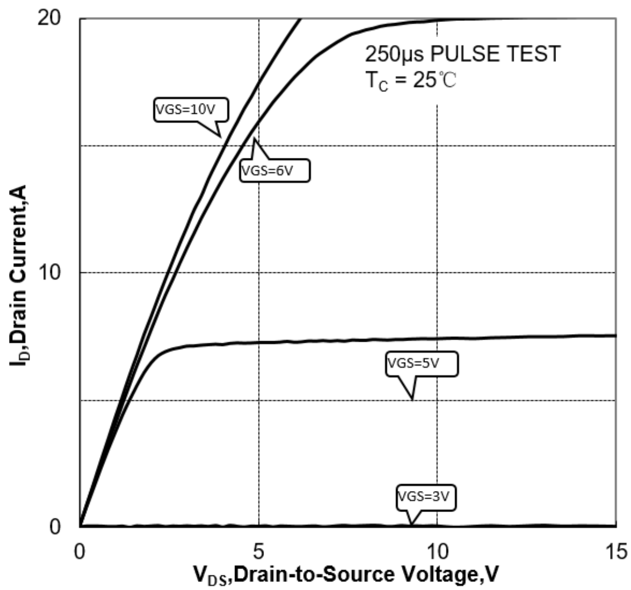


Figure 2 Typical Transfer Characteristics

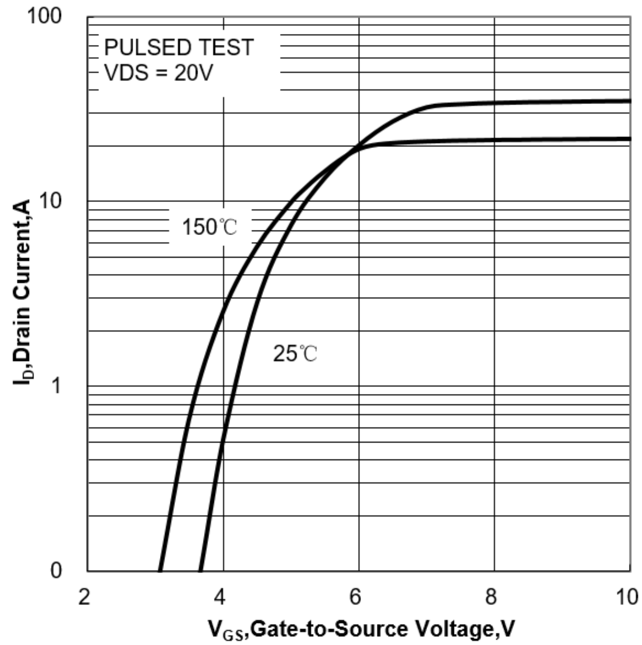


Figure 3 Typical Drain to Source ON Resistance vs Drain Current

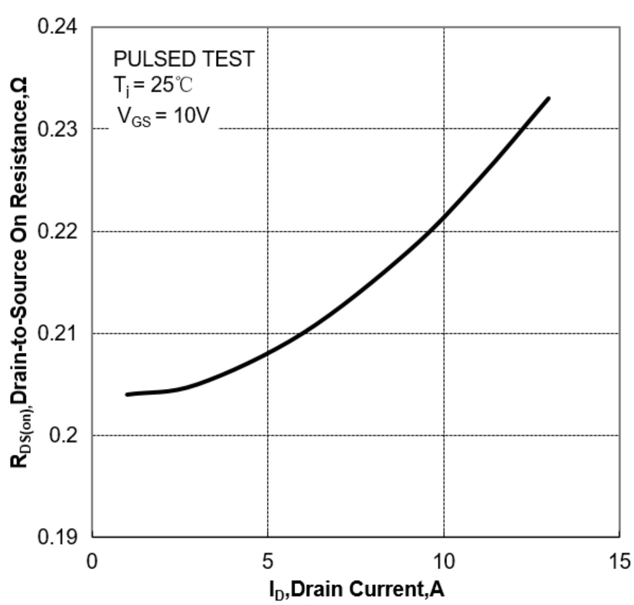
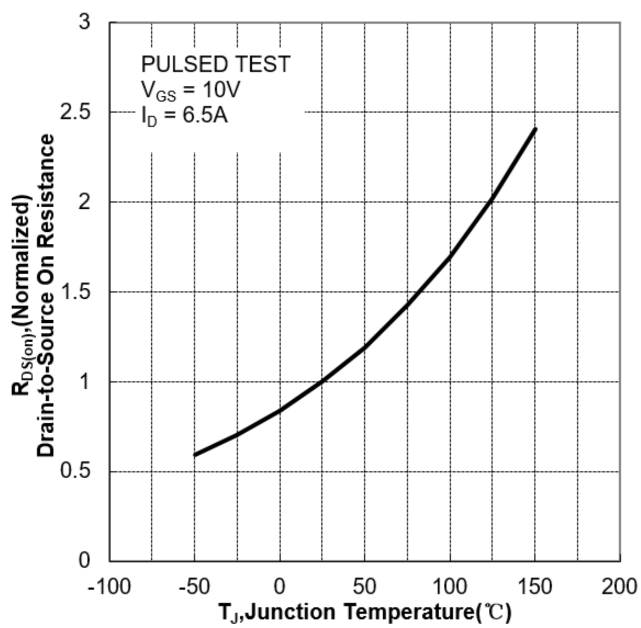


Figure 4 Typical Drian to Source on Resistance vs Junction Temperature



TYPICAL CHARAC TERISTICS (25 °C, unless otherwise noted)

Figure 5 Typical Theshold Voltage vs Junction Temperature

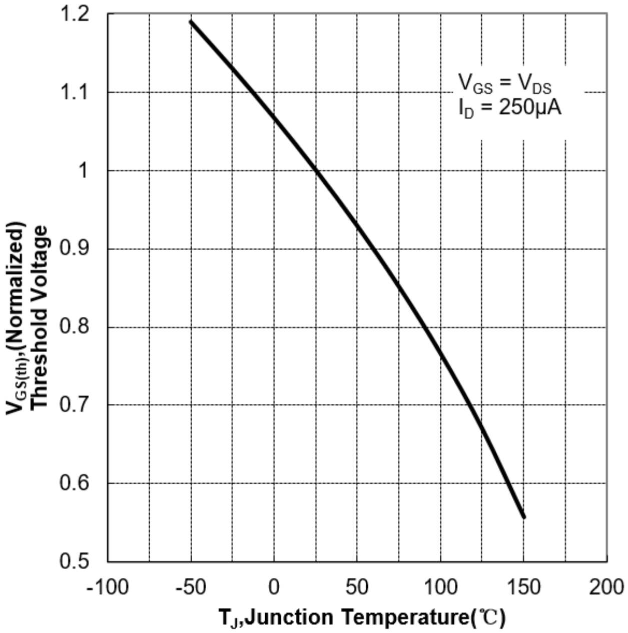


Figure 6 Typical Breakdown Voltage vs Junction Temperature

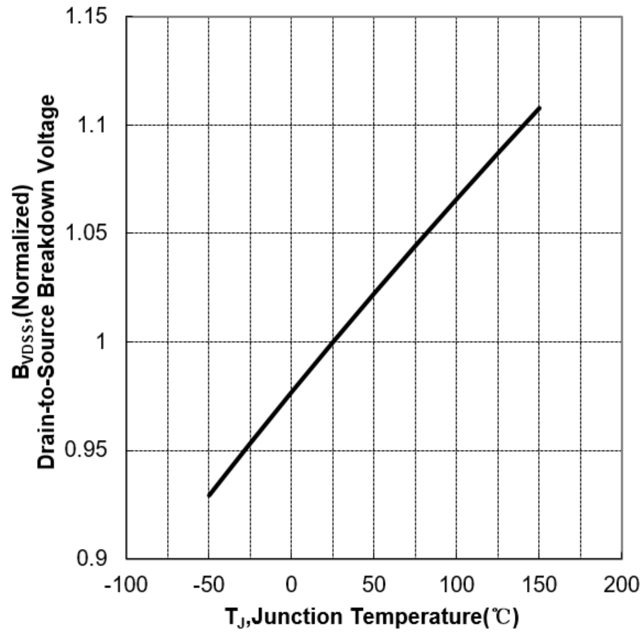


Figure 7 Typical Theshold Voltage vs Junction Temperature

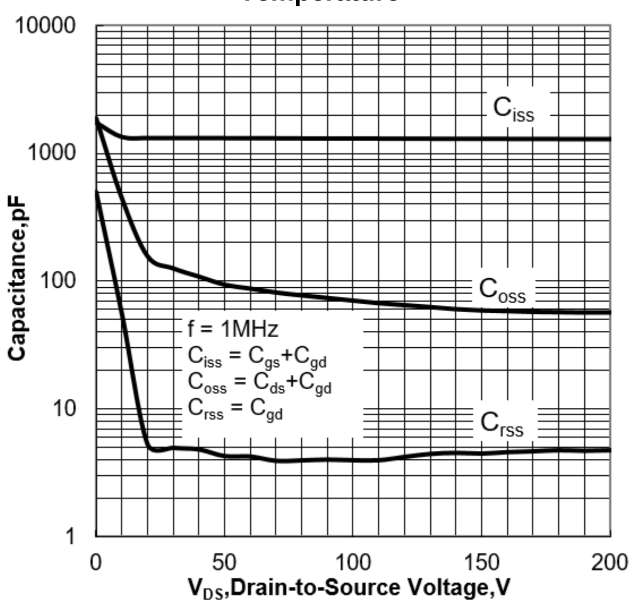
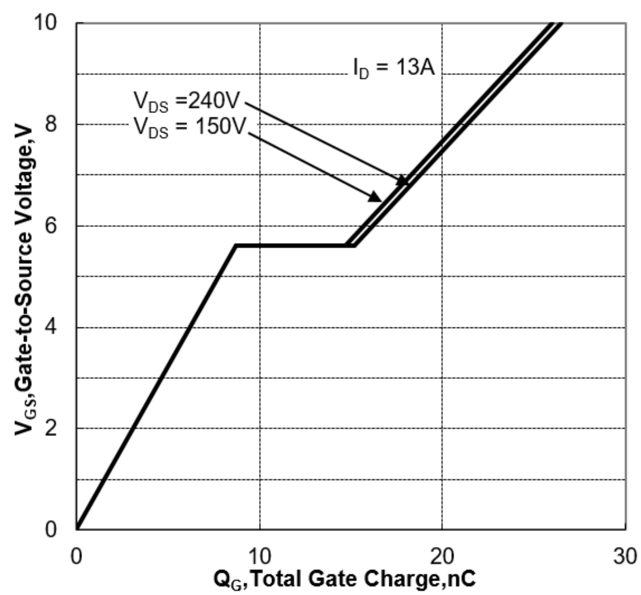


Figure 8 Typical Breakdown Voltage vs Junction Temperature



TYPICAL CHARAC TERISTICS (25 °C, unless otherwise noted)

Figure 9 Safe Operating Area

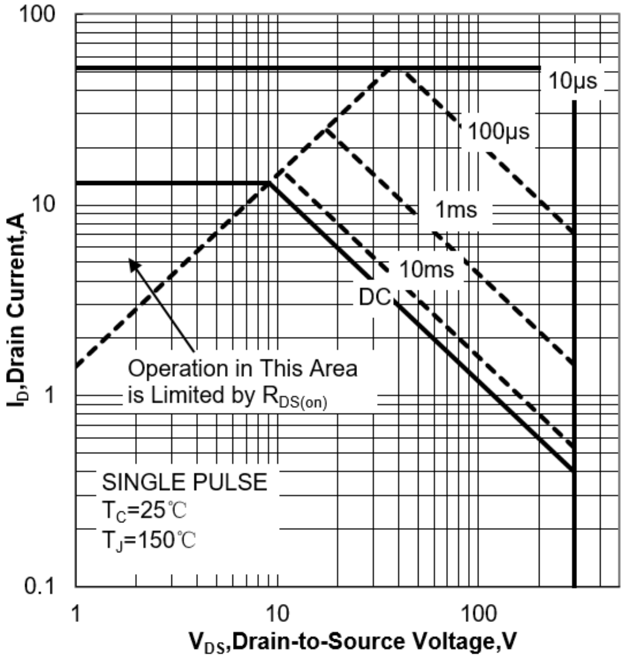


Figure 10 Power Dissipation

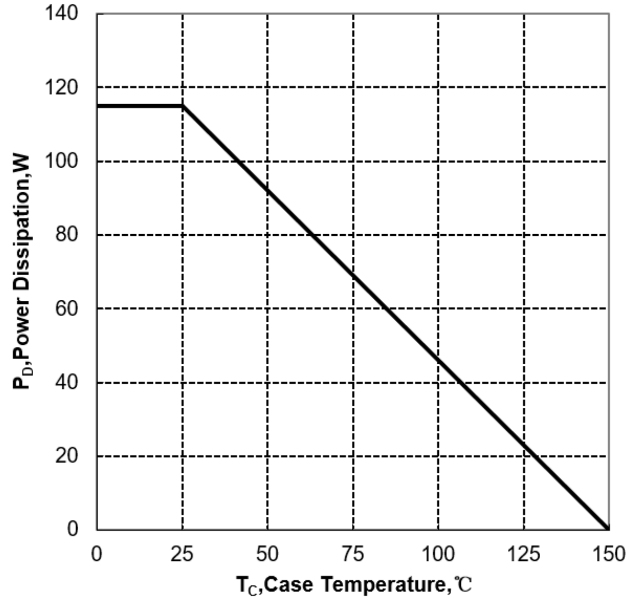
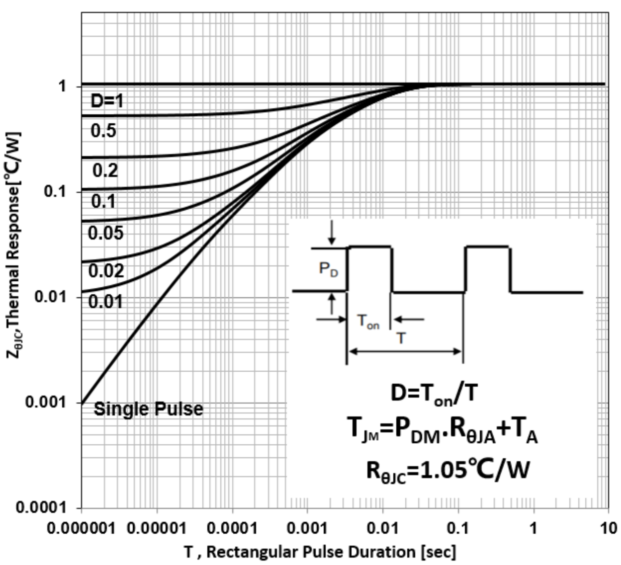
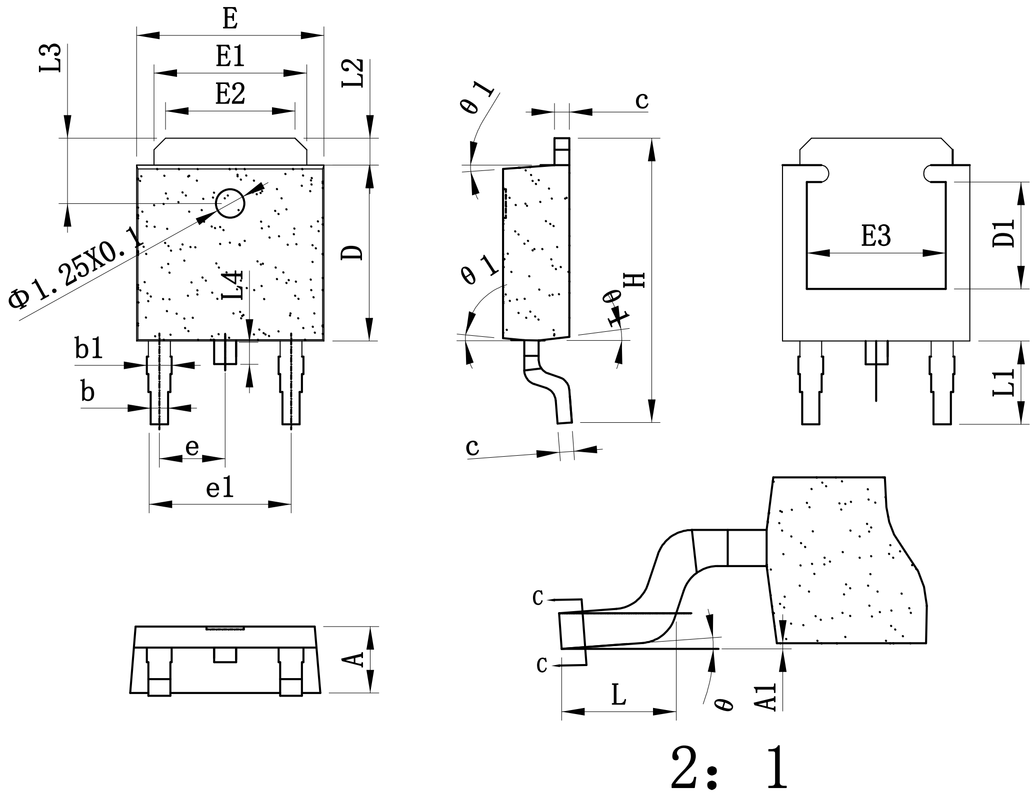


Figure 11 Max Thermal Impendance



TO-252–2L PACKAGE OUTLINE



SYMBOL	mm			SYMBOL	mm		
	MIN	TYP	MAX		MIN	TYP	MAX
A	2.20	2.30	2.40	E3	4.80 REF		
A1	1.00	1.07	1.28	e	2.286 REF		
b	0.55	0.60	0.65	e1	4.57REF		
b1	0.70	0.80	0.90	H	10.00	10.20	10.40
c	0.47	0.52	0.57	L	9.15	9.35	9.55
D	6.00	6.10	6.20	L1	2.95	3.05	3.15
D1	3.70 REF			L2	0.88	0.93	0.98
E	6.45	6.55	6.65	L3	2.20	2.26	2.31
E1	5.20	5.30	5.40	θ	0°	2°	5°
E2	4.40	4.50	4.60	θ1	5°	7°	9°

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