

N-Channel Enhancement Mode Power MOSFET

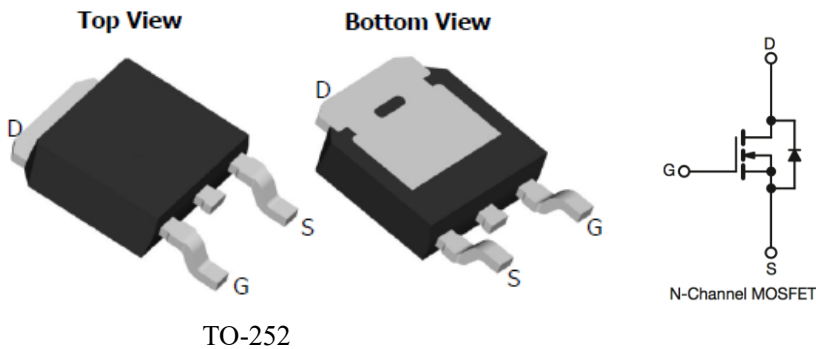
● Features

V_{DS}	$R_{DS(ON)TYP}$	I_D
30V	4.9 mΩ@10V	78A
	6.6 mΩ@4.5V	

● General Description

- DC/DC Converters in Computing
- Isolated DC/DC Converters in Telecom and Industrial

● Pin Configurations



● Absolute Maximum Ratings @ $T_A=25^{\circ}C$ unless otherwise noted

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DSS}	30	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current (Continuous)	$T_C=25^{\circ}C$	I_D	78	A
	$T_C=70^{\circ}C$		63	
Drain Current (Pulse) *B		I_{DM}	296	A
Power Dissipation	$T_C=25^{\circ}C$	P_D	62.5	W
Operating Temperature/ Storage Temperature		T_J/T_{STG}	-55~150	$^{\circ}C$

● Thermal Resistance Ratings

Parameter		Symbol	Maximum	Unit
Maximum Junction-to-Ambient	Steady State	R_{thJA}	50	$^{\circ}C/W$
Maximum Junction-to-Case (Drain)	Steady State	R_{thJC}	2	

Electrical Characteristics

$T_A=25^{\circ}\text{C}$ unless otherwise noted

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250 \mu A$	30	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30V, V_{GS} = 0V$	--	--	1	μA
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_{DS} = 250 \mu A$	1	1.6	2	V
Gate Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	--	--	± 100	nA
Drain-Source On-state Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$	--	4.9	6	m Ω
	$R_{DS(on)}$	$V_{GS} = 4.5V, I_D = 10A$	--	6.6	9	m Ω
Diode Forward Voltage	V_{SD}	$I_{SD} = 20A, V_{GS} = 0V$	--	--	1.3	V
Diode Forward Current	I_S	$T_C = 25^{\circ}\text{C}$	--	--	78	A
Switching						
Total Gate Charge	Q_g	$V_{GS} = 5V, V_{DS} = 15V, I_D = 16A$	--	15.6	--	nC
Gate-Source Charge	Q_{gs}		--	5.2	--	nC
Gate-Drain Charge	Q_{gd}		--	3.2	--	nC
Turn-on Delay Time	$t_{d(on)}$	$V_{GS} = 10V, V_{DS} = 15V, I_D = 1A,$ $R_{GEN} = 6\Omega$	--	18	--	ns
Turn-on Rise Time	t_r		--	5	--	ns
Turn-off Delay Time	$t_{d(off)}$		--	51	--	ns
Turn-Off Fall Time	t_f		--	10	--	ns
Dynamic						
Input Capacitance	C_{iss}	$V_{DS} = 15V, V_{GS} = 0V, f = 1.0\text{MHz}$	--	2465	--	pF
Output Capacitance	C_{oss}		--	330	--	pF
Reverse Transfer Capacitance	C_{rss}		--	190	--	pF

A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^{\circ}\text{C}$. The value in any given application depends on the user's specific board design.

B: Repetitive rating: Pulse width limited by maximum junction temperature.

C: The current rating is based on the $t \leq 10\text{s}$ junction to ambient thermal resistance rating.

Typical Electrical and Thermal Characteristics

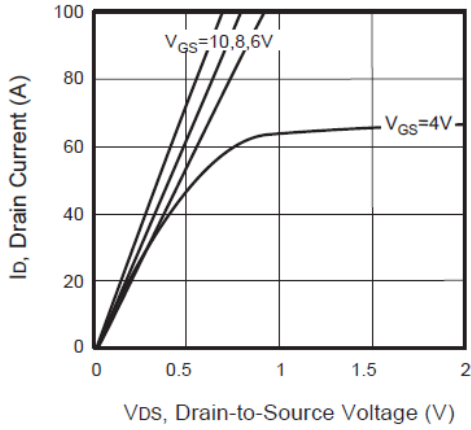


Figure 1. Output Characteristics

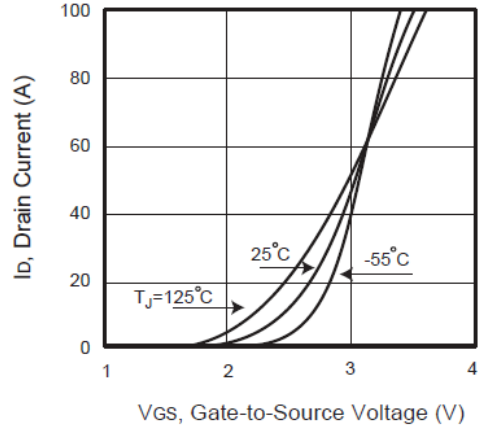


Figure 2. Transfer Characteristics

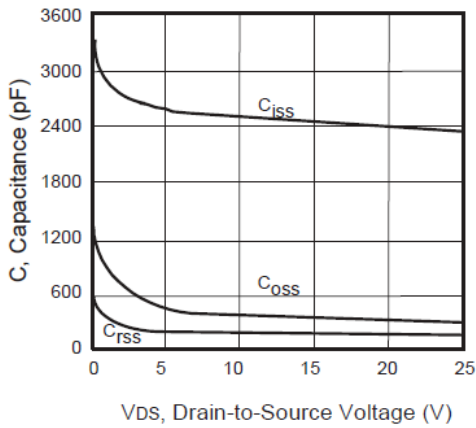


Figure 3. Capacitance

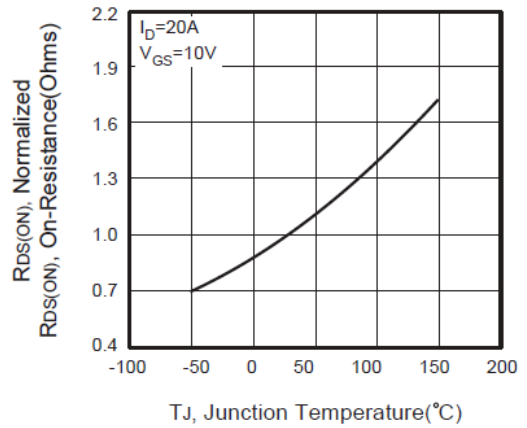


Figure 4. On-Resistance Variation with Temperature

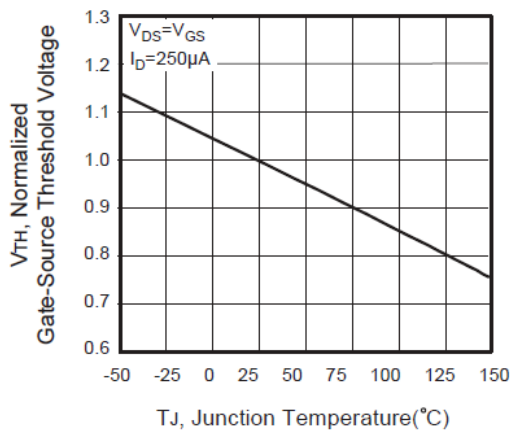


Figure 5. Gate Threshold Variation with Temperature

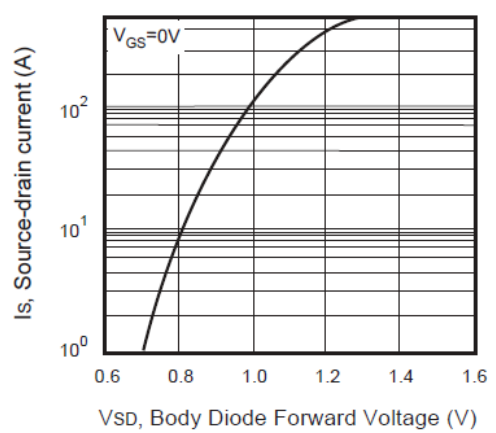


Figure 6. Body Diode Forward Voltage Variation with Source Current

Typical Electrical and Thermal Characteristics

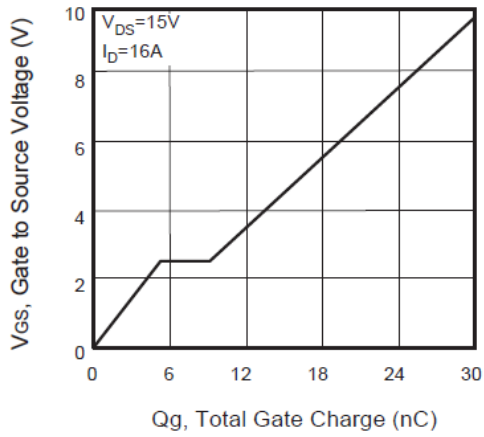


Figure 7. Gate Charge

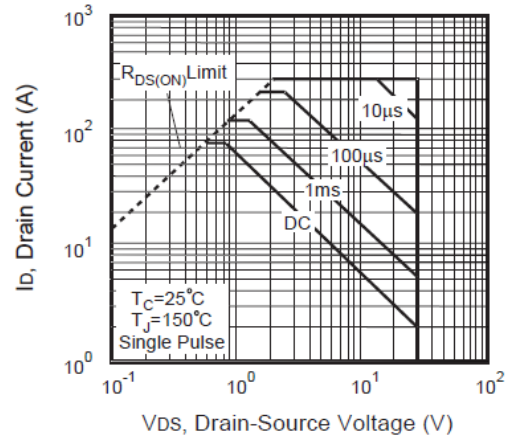


Figure 8. Maximum Safe Operating Area

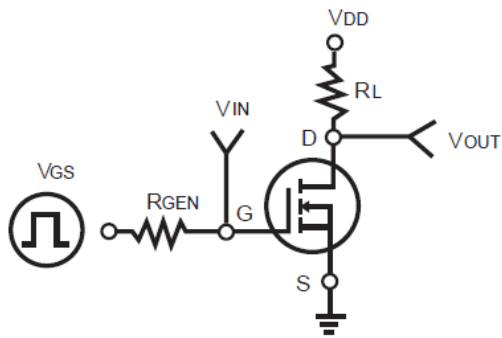


Figure 9. Switching Test Circuit

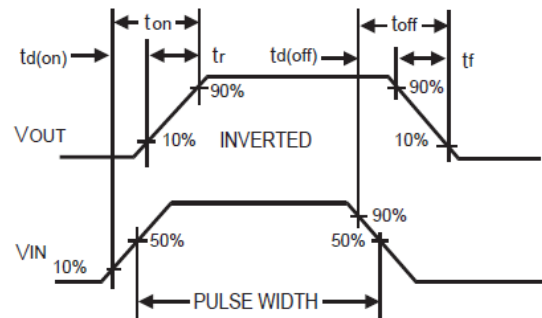


Figure 10. Switching Waveforms

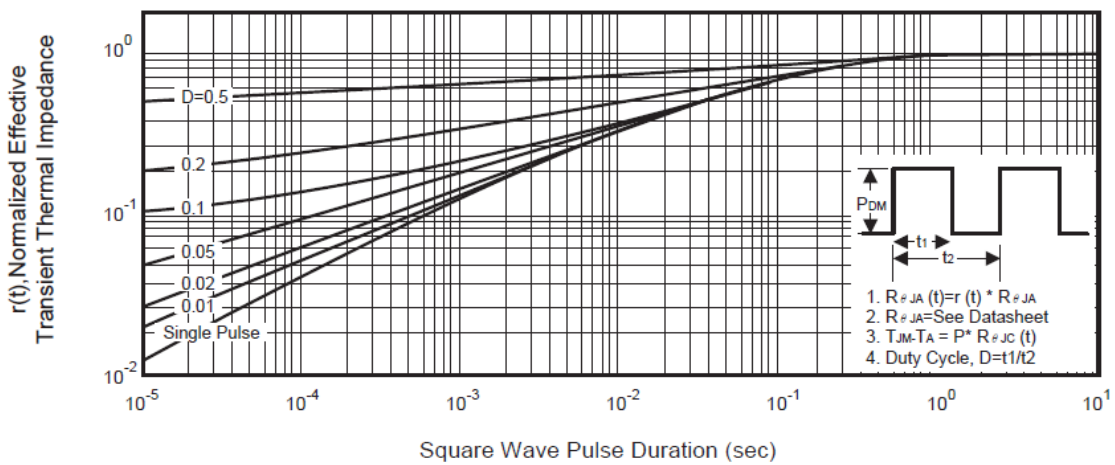
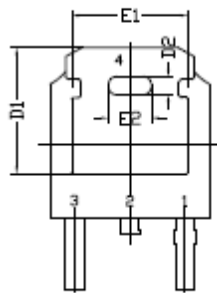
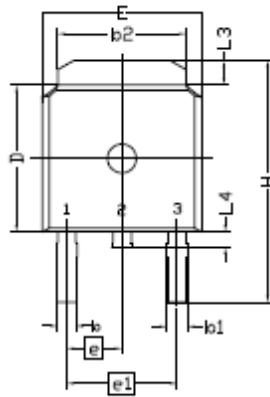
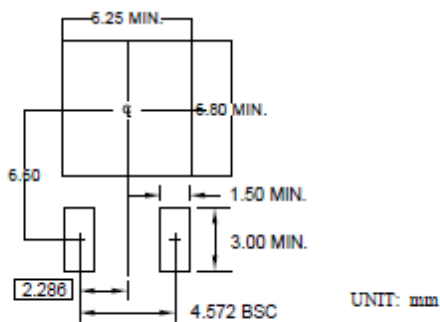


Figure 11. Normalized Thermal Transient Impedance Curve

Package Information



RECOMMENDED LAND PATTERN



NOTE

1. PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS. MOLD FLASH SHOULD BE LESS THAN 6 MILS.
2. DIMENSION L IS MEASURED IN GAUGE PLANE
3. TOLERANCE 0.10 mm UNLESS OTHERWISE SPECIFIED
4. CONTROLLING DIMENSION IS MILLIMETER. CONVERTED INCH DIMENSIONS ARE NOT NECESSARILY EXACT.
5. REFER TO JEDEC TO-252 (AA)

DIMENSION	DIMENSION IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	2.184	2.286	2.388	0.086	0.090	0.094
A1	0.000	---	0.127	0.000	---	0.005
A2	0.889	1.041	1.143	0.035	0.041	0.045
b	0.635	0.762	0.889	0.025	0.030	0.035
b1	0.762	0.840	1.143	0.030	0.033	0.045
b2	4.953	5.340	5.461	0.195	0.210	0.215
c	0.450	0.508	0.610	0.018	0.020	0.024
c1	0.450	0.508	0.610	0.018	0.020	0.024
D	5.969	6.096	6.223	0.235	0.240	0.245
D1	5.210	5.249	5.380	0.205	0.207	0.212
D2	0.662	0.762	0.862	0.026	0.030	0.034
E	6.350	6.604	6.731	0.250	0.260	0.265
E1	4.318	4.826	4.901	0.170	0.190	0.193
E2	1.678	1.778	1.878	0.066	0.070	0.074
e	2.286 BSC			0.090 BSC		
e1	4.572 BSC			0.180 BSC		
H	9.398	10.033	10.414	0.370	0.395	0.410
L	1.270	1.520	2.032	0.050	0.060	0.080
L1	2.921 REF.			0.115 REF.		
L2	0.408	0.508	0.608	0.016	0.020	0.024
L3	0.889	1.016	1.270	0.035	0.040	0.050
L4	0.635	---	1.016	0.025	---	0.040