

N-Channel 60 V (D-S) Super Junction Power MOSFET

PRODUCT SUMMARY

V _{DS} (V)	R _{DS(on)} (mΩ)(TYP.)	I _D (A) ^a
60	9.3 at V _{GS} = 10 V	55
	12.2 at V _{GS} = 4.5 V	50

FEATURES

- 175 °C Junction Temperature
- DT-SJ Power MOSFET

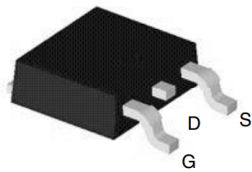
APPLICATIONS

- Load Switch

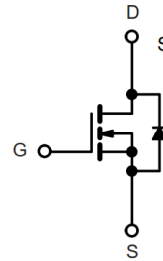


RoHS
COMPLIANT

TO-252 Pin Configuration



Top View



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_C = 25 °C, unless otherwise noted)

Parameter	Symbol	Limit	Unit
Gate-Source Voltage	V _{GS}	± 20	V
Continuous Drain Current (T _J = 175 °C) ^b	I _D	T _C = 25 °C	55
		T _C = 100 °C	50 ^a
Pulsed Drain Current	I _{DM}	165	A
Continuous Source Current (Diode Conduction)	I _S	50 ^a	
Avalanche Current	I _{AS}	50	
Single Avalanche Energy (Duty Cycle ≤ 1 %)	L = 0.1 mH E _{AS}	125	mJ
Maximum Power Dissipation	P _D	T _C = 25 °C	136
		T _A = 25 °C	3 ^b , 8.3 ^{b, c}
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to 175	°C

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^a	R _{thJA}	t ≤ 10 sec	15	°C/W
		Steady State	40	
Maximum Junction-to-Case	R _{thJC}	0.85	1.1	

Notes:

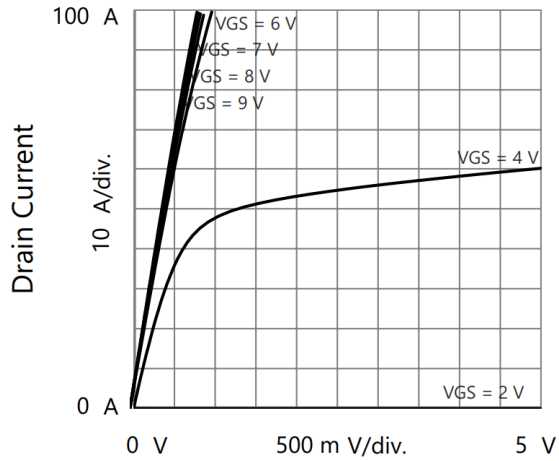
- Package limited.
- Surface mounted on 1" x 1" FR4 board.
- t ≤ 10 s.

SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ. ^a	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	60			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	1		3	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 60\text{ V}, V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 48\text{ V}, V_{GS} = 0\text{ V}, T_J = 125\text{ }^\circ\text{C}$			50	
		$V_{DS} = 48\text{ V}, V_{GS} = 0\text{ V}, T_J = 175\text{ }^\circ\text{C}$			250	
On-State Drain Current ^b	$I_{D(on)}$	$V_{DS} = 5\text{ V}, V_{GS} = 10\text{ V}$	55			A
Drain-Source On-State Resistance ^b	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 10\text{ A}$		9.3	11	m Ω
		$V_{GS} = 4.5\text{ V}, I_D = 5\text{ A}$		12.2	13.5	
Forward Transconductance ^b	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 10\text{ A}$		60		S
Dynamic						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 30\text{ V}, f = 1\text{ MHz}$		1200		pF
Output Capacitance	C_{oss}			355		
Reverse Transfer Capacitance	C_{rss}			8.9		
Total Gate Charge ^c	Q_g	$V_{DS} = 30\text{ V}, V_{GS} = 10\text{ V}, I_D = 10\text{ A}$		22		nC
Gate-Source Charge ^c	Q_{gs}			13.1		
Gate-Drain Charge ^c	Q_{gd}			3.36		
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = 30\text{ V}, R_L = 0.6\text{ }\Omega$ $I_D \cong 10\text{ A}, V_{GEN} = 10\text{ V}, R_g = 2.5\text{ }\Omega$		10		ns
Rise Time ^c	t_r			15		
Turn-Off Delay Time ^c	$t_{d(off)}$			35		
Fall Time ^c	t_f			20		
Source-Drain Diode Ratings and Characteristics ($T_C = 25\text{ }^\circ\text{C}$)						
Pulsed Current	I_{SM}				165	A
Diode Forward Voltage	V_{SD}	$I_F = 20\text{ A}, V_{GS} = 0\text{ V}$		1	1.5	V
Reverse Recovery Time	t_{rr}	$I_F = 20\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		45		ns

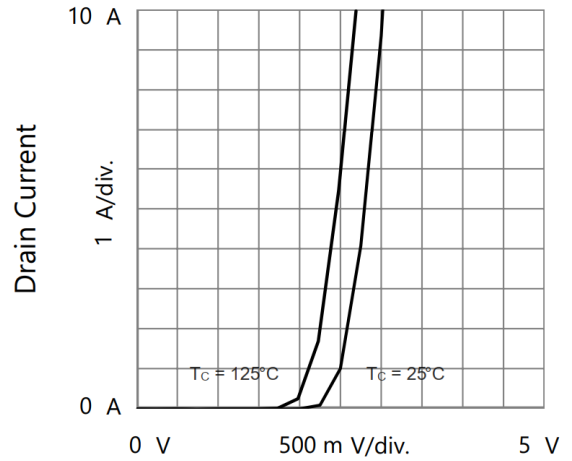
Notes:

- For design aid only; not subject to production testing.
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- Independent of operating temperature.

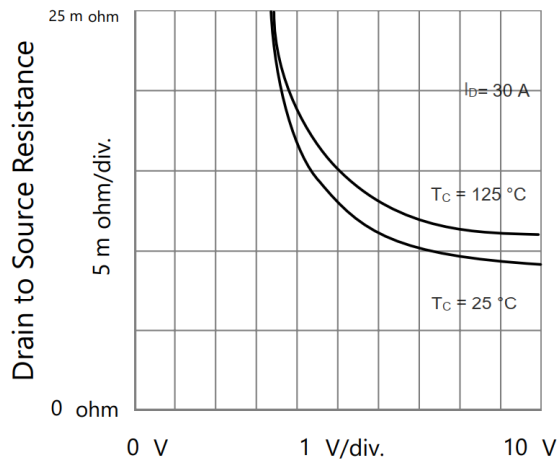
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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



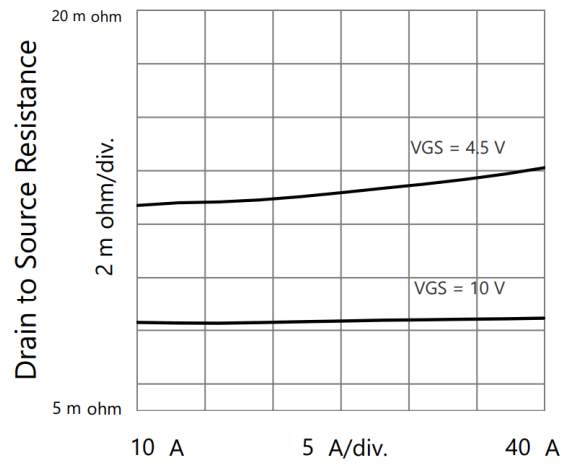
Drain to Source Voltage
Output Characteristics



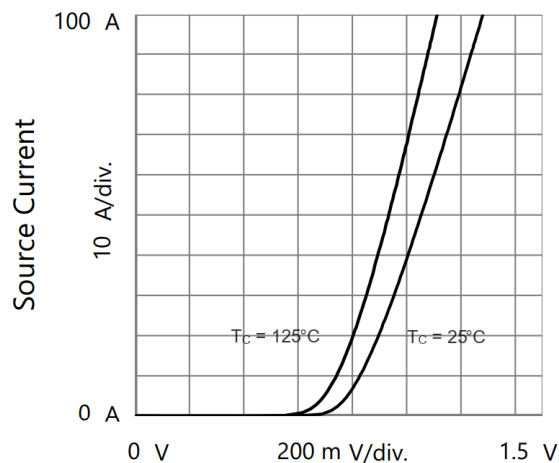
Gate to Source Voltage
Transfer Characteristics



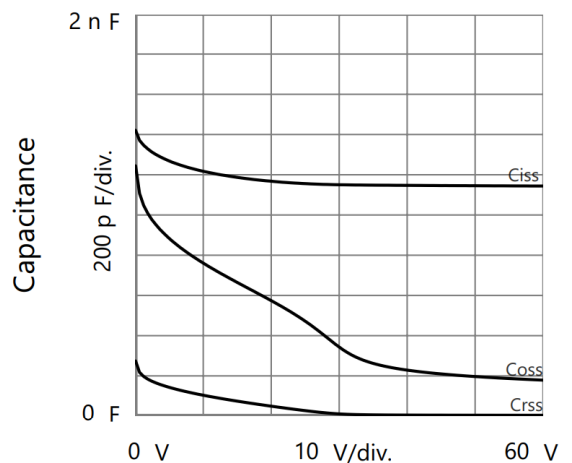
Gate to Source Voltage
Drain to Source Resistance vs. Gate to Source Voltage



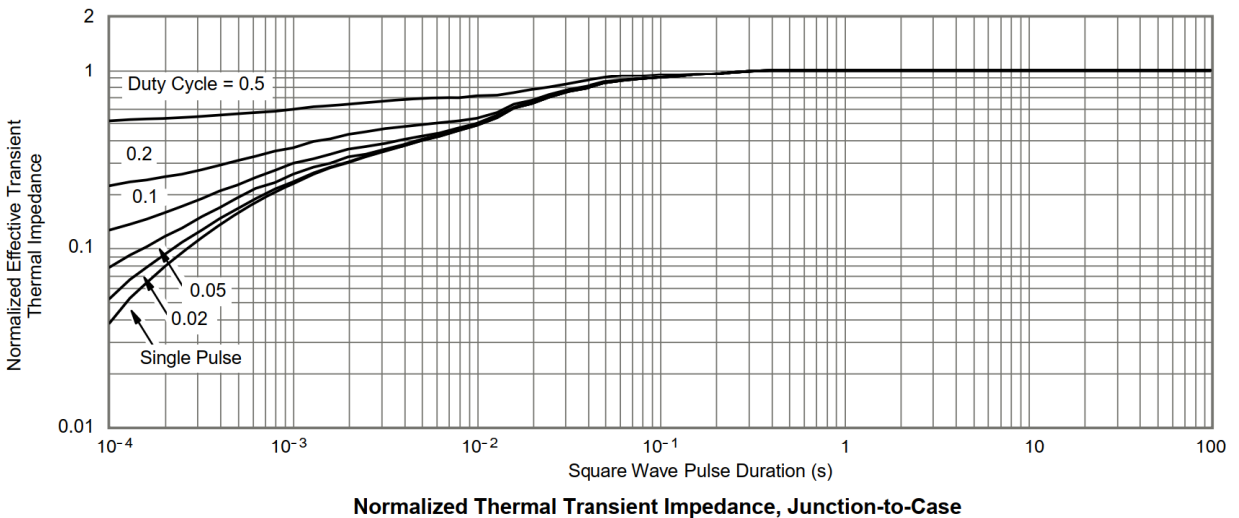
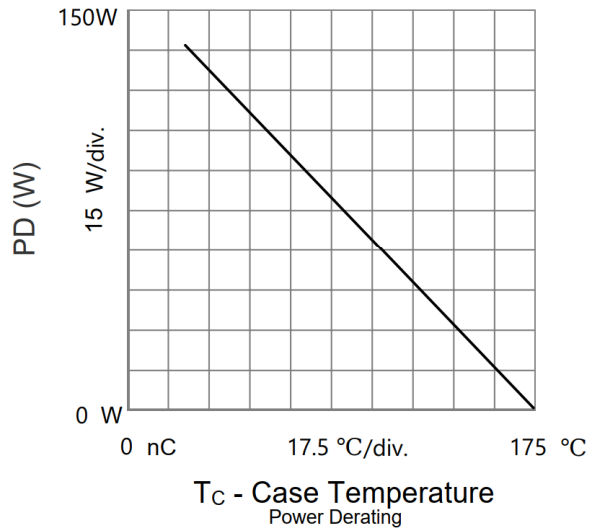
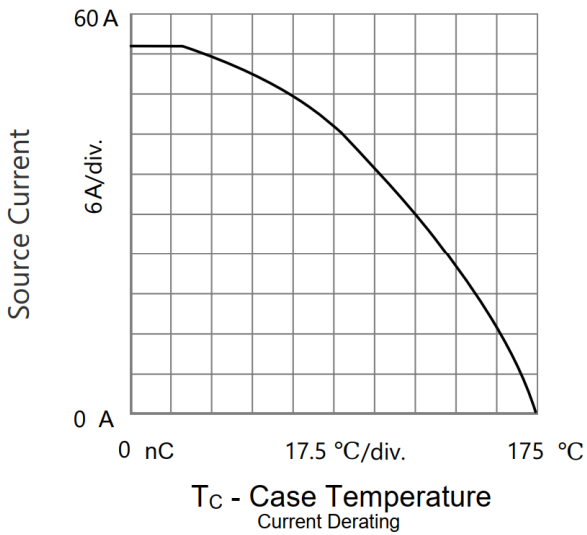
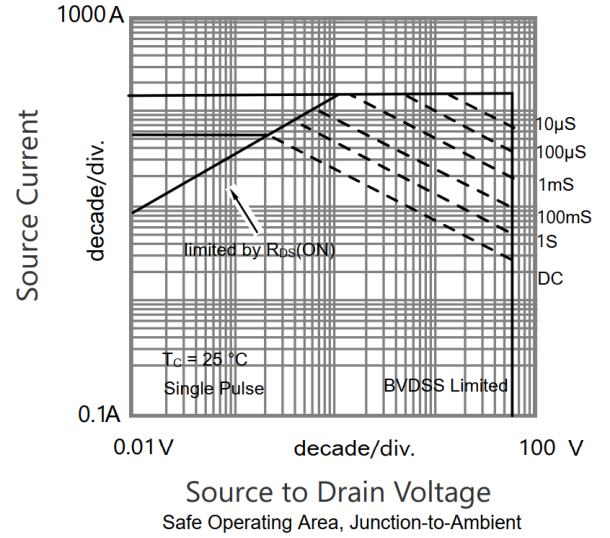
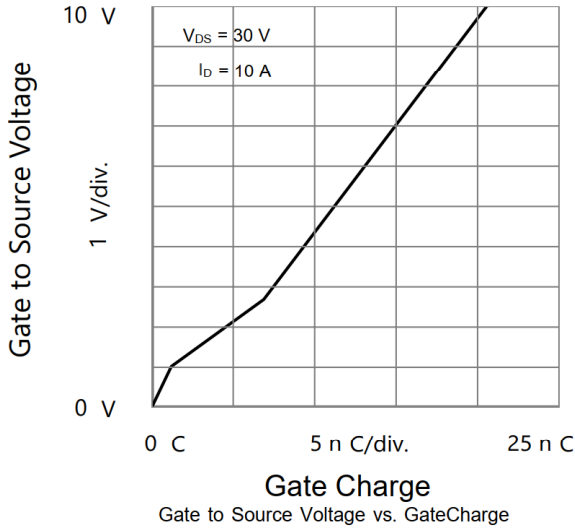
Drain Current
Drain to Source Resistance vs. Drain Current



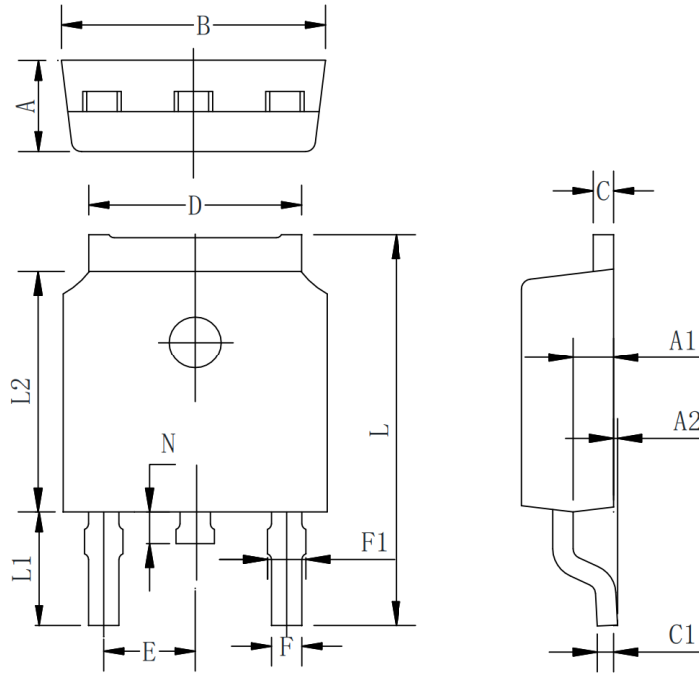
Source to Drain Voltage
Body Diode Forward Characteristics



Drain to Source Voltage
Capacitances



TO-252-2L PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

Symbol	Min	Typ	Max
A	2.10	2.30	2.50
A1	0.88	1.01	1.16
A2	0.00	0.15	0.28
B	6.40	6.60	6.80
C	0.42	0.50	0.63
C1	0.42	0.50	0.63
D	5.08	5.32	5.65
E	2.286 TYP		
F	0.63	0.76	0.89
F1	0.64	0.86	1.08
L	9.30	9.90	10.80
L1	2.4	2.8	3.6
L2	5.90	6.10	6.55
N	0.57	0.80	1.05

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