

N-Channel 60 V (D-S) MOSFET



RoHS
COMPLIANT

PRODUCT SUMMARY		
V _{DS} (V)	R _{DS(on)} (mΩ)(Typ.)	I _D (A) ^a (Max.)
60	29 at V _{GS} = 10 V	35
	36 at V _{GS} = 4.5 V	

FEATURES

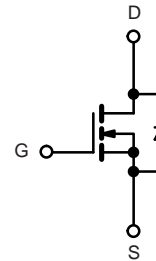
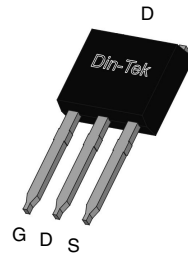
- DT-Trench Power MOSFET
- 100% Rg and UIS Tested

APPLICATIONS

- Motor Drive
- Power Tools

TO-251 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 = 150 °C) ^b	T _C = 25 °C	I _D	35	A
	T _C = 100 °C		25 ^a	
Pulsed Drain Current		I _{DM}	90	
Continuous Source Current (Diode Conduction)		I _S	35	
Avalanche Current		I _{AS}	30	
Single Avalanche Energy (Duty Cycle ≤ 1 %)		E _{AS}	29	mJ
Maximum Power Dissipation	T _C = 25 °C	P _D	45	W
	T _A = 25 °C		2.3 ^{b, c}	
Operating Junction and Storage Temperature Range		T _J , T _{stg}	- 55 to 150	°C

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^a	t ≤ 10 sec	R _{thJA}	13	18	°C/W
	Steady State		35	55	
Maximum Junction-to-Case		R _{thJC}	2.0	3.0	

Notes:

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

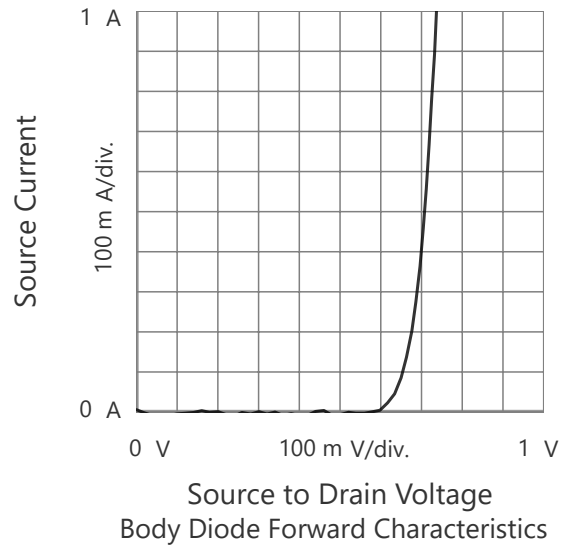
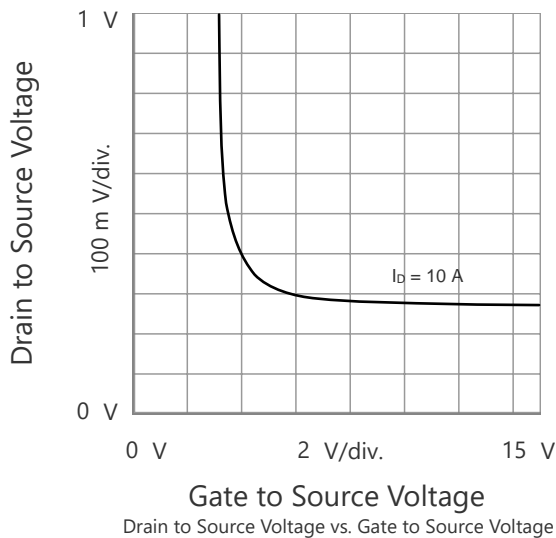
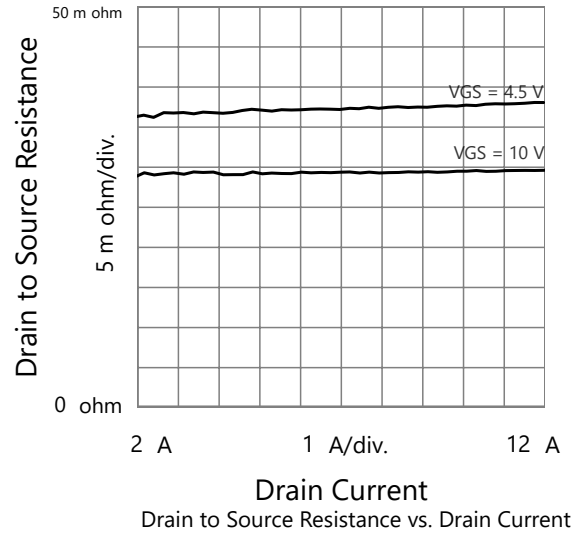
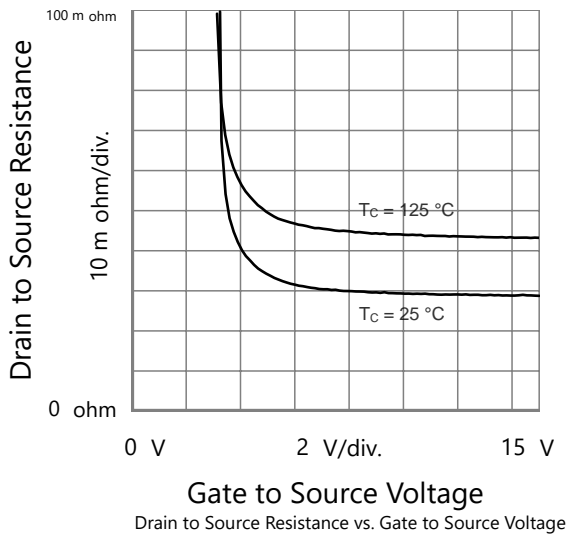
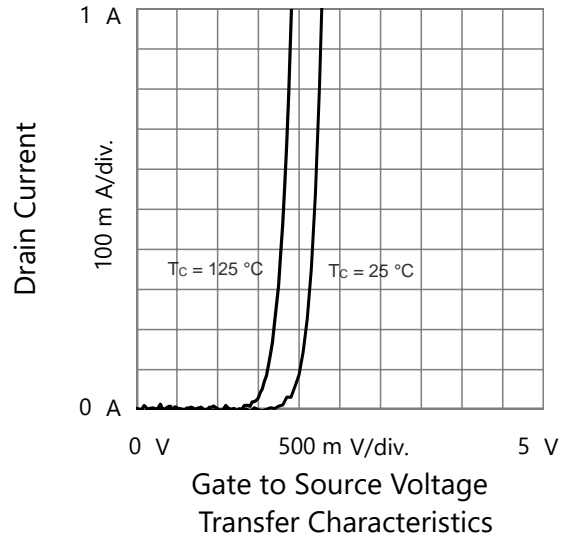
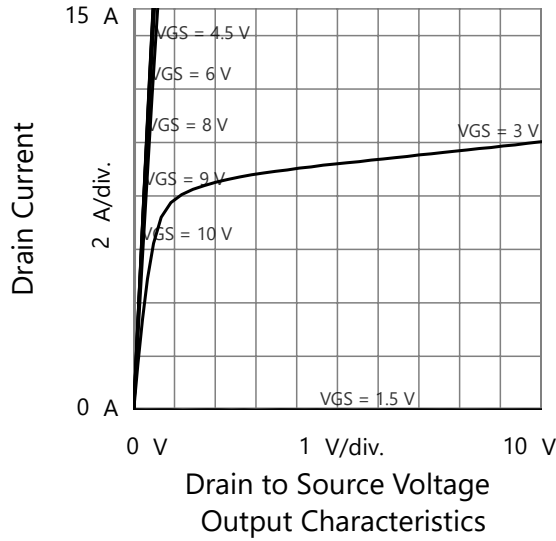
SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ. ^a	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	60			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	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	
On-State Drain Current ^b	$I_{D(on)}$	$V_{DS} = 5\text{ V}, V_{GS} = 10\text{ V}$	35			A
Drain-Source On-State Resistance ^b	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 15\text{ A}$		29	36	m Ω
		$V_{GS} = 4.5\text{ V}, I_D = 10\text{ A}$		36	46	
Forward Transconductance ^b	g_{fs}	$V_{DS} = 5\text{ V}, I_D = 20\text{ A}$		40		S
Dynamic						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 30\text{ V}, f = 1\text{ MHz}$		826		pF
Output Capacitance	C_{oss}			51		
Reverse Transfer Capacitance	C_{rss}			43		
Total Gate Charge ^c	Q_g	$V_{DS} = 30\text{ V}, V_{GS} = 10\text{ V}, I_D = 15\text{ A}$		20	30	nC
Gate-Source Charge ^c	Q_{gs}			1.9		
Gate-Drain Charge ^c	Q_{gd}			4.5		
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = 30\text{ V}, R_L = 1.0\text{ }\Omega$ $I_D = 15\text{ A}, V_{GEN} = 10\text{ V}, R_g = 2.5\text{ }\Omega$		13		ns
Rise Time ^c	t_r			46		
Turn-Off Delay Time ^c	$t_{d(off)}$			25		
Fall Time ^c	t_f			10		
Source-Drain Diode Ratings and Characteristics ($T_C = 25\text{ }^\circ\text{C}$)						
Pulsed Current	I_{SM}				90	A
Diode Forward Voltage	V_{SD}	$I_F = 1\text{ A}, V_{GS} = 0\text{ V}$		0.6	1.0	V
Reverse Recovery Time	t_{rr}	$I_F = 15\text{ A}, di/dt = 500\text{ A}/\mu\text{s}$		25	50	ns
Reverse Recovery Charge	Q_{rr}	$I_F = 15\text{ A}, di/dt = 500\text{ A}/\mu\text{s}$		45	100	nC

Notes:

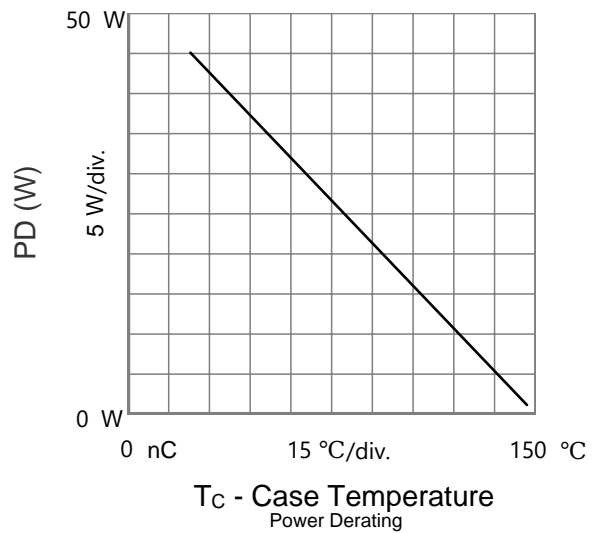
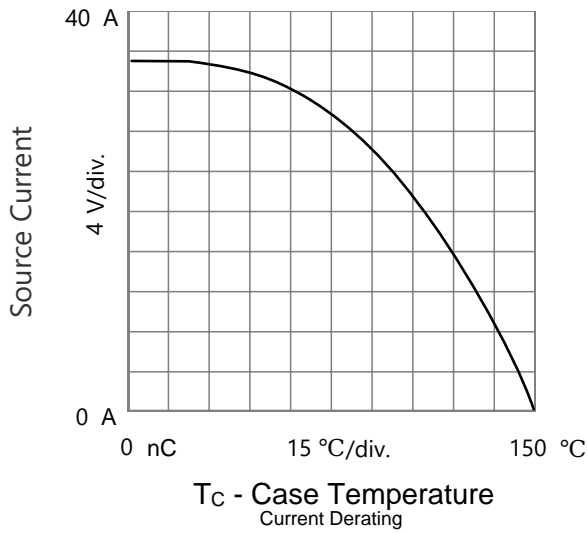
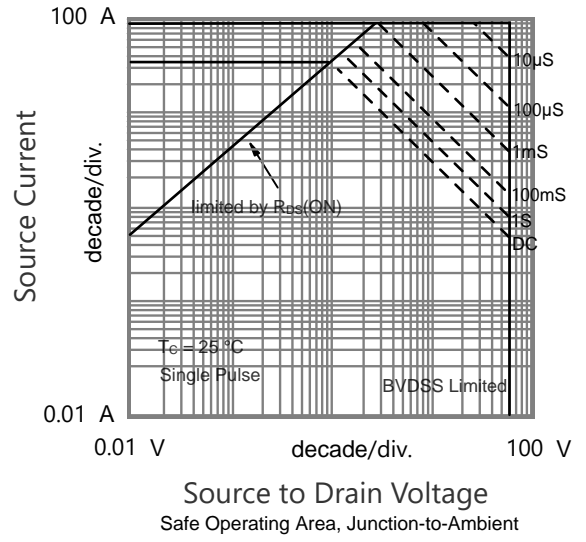
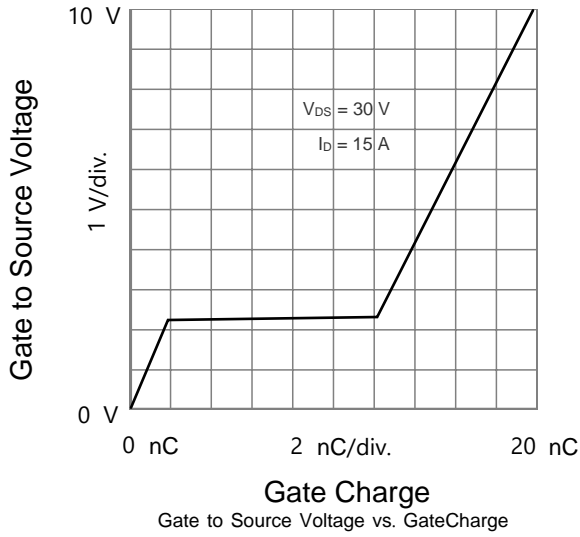
- a. For design aid only; not subject to production testing.
 b. Pulse test; pulse width 300 μs , duty cycle 2 %.
 c. Independent of operating temperature.

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.

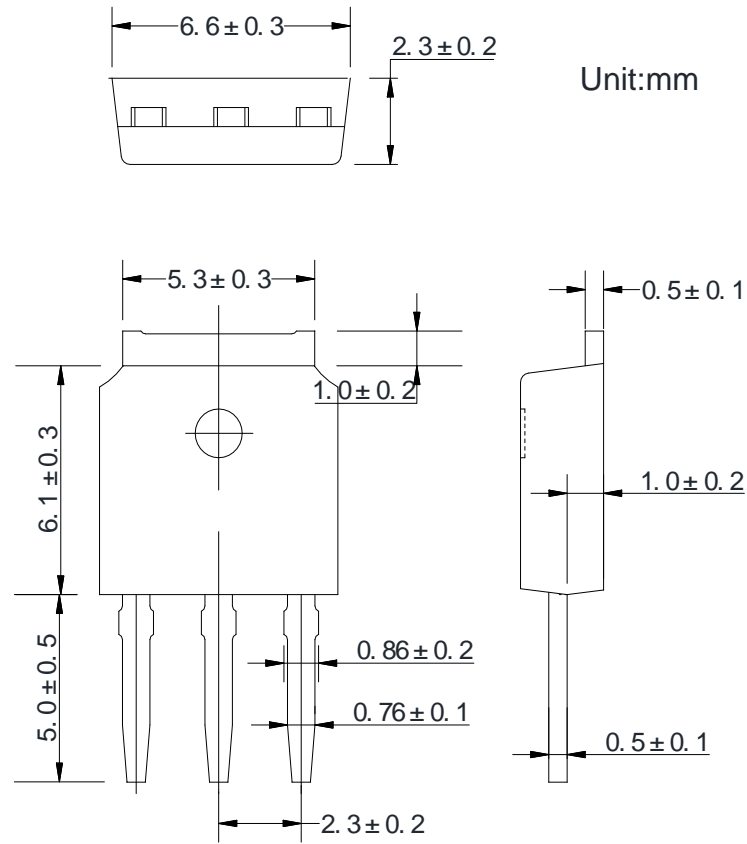
TYPICAL CHARACTERISTICS (25 °C unless noted)



TYPICAL CHARACTERISTICS (25 °C unless noted)



TO-251 PACKAGE OUTLINE



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