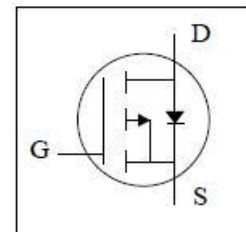
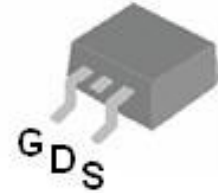


## P-CHANNEL ENHANCEMENT MODE POWER

### MOSFET

#### ❖ GENERAL DESCRIPTION

The TO-252 package is widely preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.



#### ❖ FEATURES

- ▼ Simple Drive Requirement
- ▼ Fast Switching Characteristic
- ▼ RoHS Compliant & Halogen-Free

$BV_{DSS}$	-40V
$R_{DS(ON)}$	90m $\Omega$
$I_D$	-14A

#### ❖ ABSOLUTE MAXIMUM RATINGS

Characteristics	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	-40	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current, $V_{GS}$ @ 10V	$I_D@T_C=25^\circ C$	-14	A
Continuous Drain Current, $V_{GS}$ @ 10V	$I_D@T_C=100^\circ C$	-8.6	A
Pulsed Drain Current <sup>1</sup>	$I_{DM}$	-40	A
Total Power Dissipation	$P_D@T_C=25^\circ C$	26	W
Linear Derating Factor		0.21	W/ $^\circ C$
Storage Temperature Range	$T_{STG}$	-55 to 150	$^\circ C$
Operating Junction Temperature Range	$T_J$	-55 to 150	$^\circ C$

#### ❖ THERMAL DATA

Characteristics	Symbol	Rating	Unit
Maximum Thermal Resistance, Junction-case	$R_{thj-c}$	4.8	$^\circ C/W$
Maximum Thermal Resistance, Junction-ambient (PCB mount) <sup>3</sup>	$R_{thj-a}$	62.5	$^\circ C/W$
Maximum Thermal Resistance, Junction-ambient	$R_{thj-a}$	110	$^\circ C/W$

**❖ ELECTRICAL CHARACTERISTICS**

 ( $V_{CC} = 5V$ ,  $T_A = 25^\circ C$ , unless otherwise specified)

Characteristics	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V$ , $I_D=-250\mu A$	-40	-	-	V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to $25^\circ C$ , $I_D=-1mA$	-	-0.03	-	V/ $^\circ C$
Static Drain-Source On-Resistance <sup>2</sup>	$R_{DS(ON)}$	$V_{GS}=-10V$ , $I_D=-10A$	-	-	90	m $\Omega$
		$V_{GS}=-4.5V$ , $I_D=-6A$			130	m $\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ , $I_D=-250\mu A$	-1	-	-3	V
Forward Trans conductance	$g_{fs}$	$V_{DS}=-10V$ , $I_D=-10A$	-	7	-	S
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=-40V$ , $V_{GS}=0V$	-	-	-1	$\mu A$
Drain-Source Leakage Current ( $T_J=125^\circ C$ )		$V_{DS}=-32V$ , $V_{GS}=0V$			-250	$\mu A$
Gate-Source Leakage	$I_{GSS}$	$V_{GS}=+20V$ , $V_{DS}=0V$			$\pm 100$	nA
Total Gate Charge <sup>2</sup>	$Q_g$	$I_D=-10A$	-	7	12	nC
Gate-Source Charge	$Q_{gs}$	$V_{DS}=-30V$	-	2	-	nC
Gate-Drain ("Miller") Charge	$Q_{gd}$	$V_{GS}=-4.5V$	-	4	-	nC
Turn-on Delay Time <sup>2</sup>	$t_{d(on)}$	$V_{DS}=-20V$	-	8	-	sn
Rise Time	$t_r$	$I_D=-10A$	-	20	-	ns
Turn-off Delay Time	$t_{d(off)}$	$R_G=3.3\Omega$	-	19	-	ns
Fall Time	$t_f$	$V_{GS}=-10V$	-	6	-	ns
		$R_D=2\Omega$	-	6	-	ns
Input Capacitance	$C_{iss}$	$V_{GS}=0V$	-	490	780	pF
Output Capacitance	$C_{oss}$	$V_{DS}=-25V$	-	80	-	pF
Reverse Transfer Capacitance	$C_{rss}$	$f=1.0MHz$	-	65	-	pF
Gate Resistance	$R_g$	$f=1.0MHz$	-	5.8	8.7	$\Omega$
<b>Source-Drain Diode</b>						
Forward On Voltage <sup>2</sup>	$V_{DS}$	$I_S=-10A$ , $V_{GS}=0V$	-	-	-1.3	V
Reverse Recovery Time <sup>2</sup>	$t_{rr}$	$I_S=-10A$ , $V_{GS}=0V$ ,	-	28	-	ns
Reverse Recovery Charge	$Q_{rr}$	$dI/dt=-100A/\mu s$	-	26	-	nC

Notes:

1. Pulse width limited by Max. junction temperature.
2. Pulse test
3. Surface mounted on 1 in2 copper pad of FR4 board AM9569D

THIS PRODUCT IS SENSITIVE TO ELECTROSTATIC DISCHARGE, PLEASE HANDLE WITH CAUTION. USE OF THIS PRODUCT AS A CRITICAL COMPONENT IN LIFE SUPPORT OR OTHER SIMILAR SYSTEMS IS NOT AUTHORIZED. AXElite DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS. AXElite RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN.

❖ TYPICAL CHARACTERISTICS

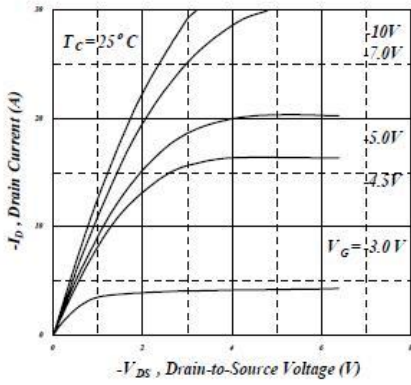


Fig 1. Typical Output Characteristics

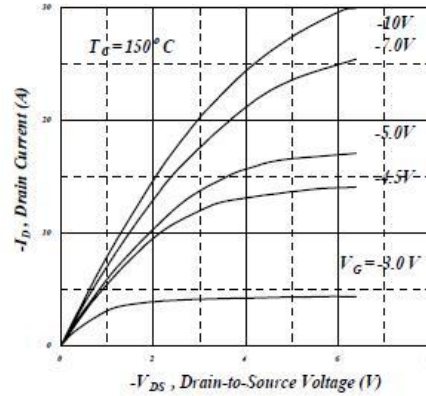


Fig 2. Typical Output Characteristics

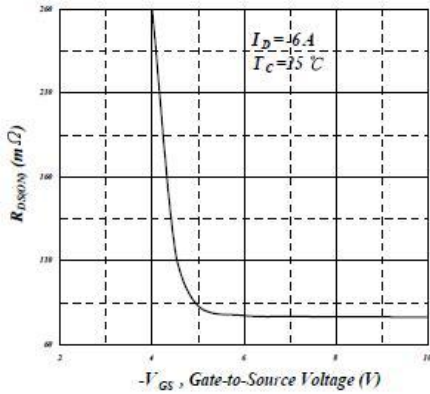


Fig 3. On-Resistance v.s. Gate Voltage

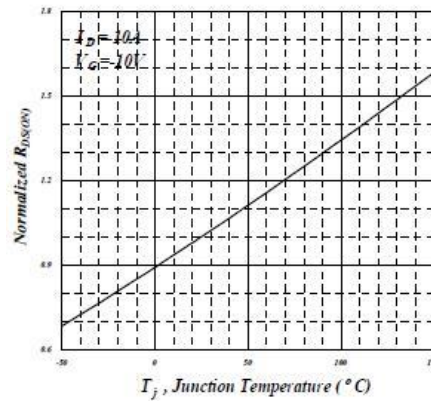


Fig 4. Normalized On-Resistance v.s. Junction Temperature

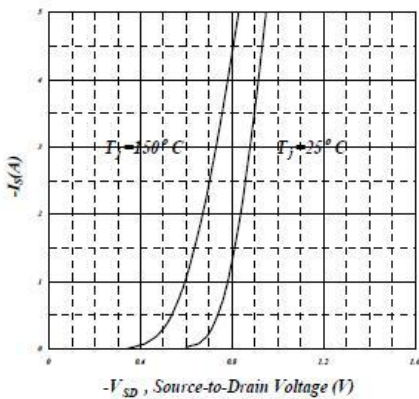


Fig 5. Forward Characteristic of Reverse Diode

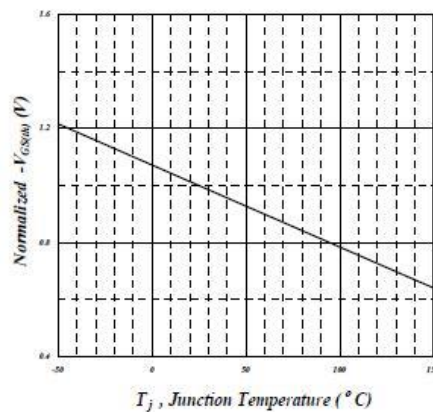


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

❖ **TYPICAL CHARACTERISTICS (COUNTINOUS)**

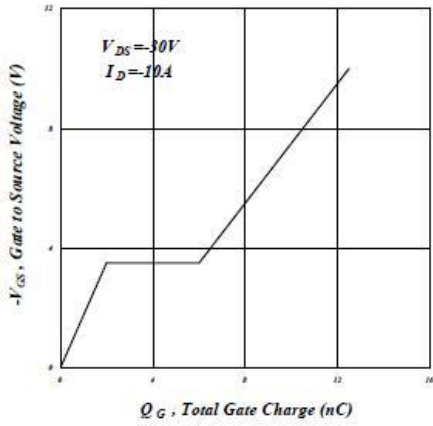


Fig 1. Typical Output Characteristics

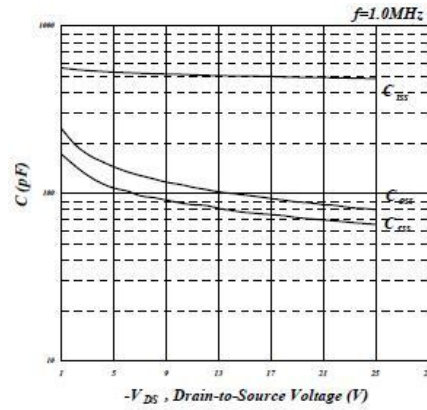


Fig 2. Typical Output Characteristics

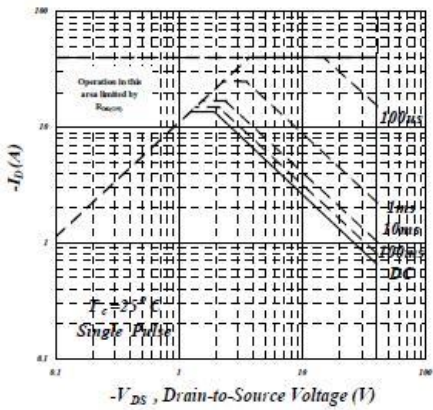


Fig 3. On-Resistance v.s. Gate Voltage

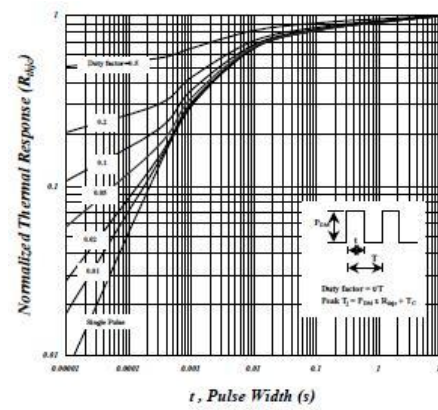


Fig 4. Normalized On-Resistance v.s. Junction Temperature

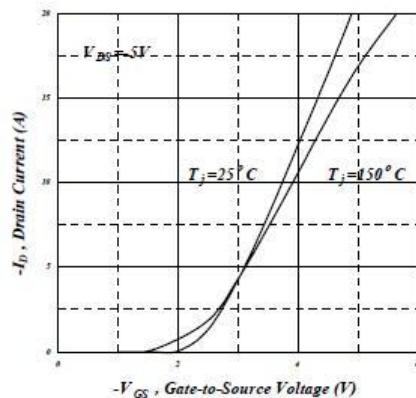


Fig 5. Forward Characteristic of Reverse Diode

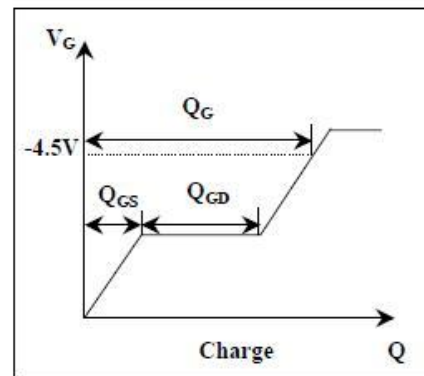
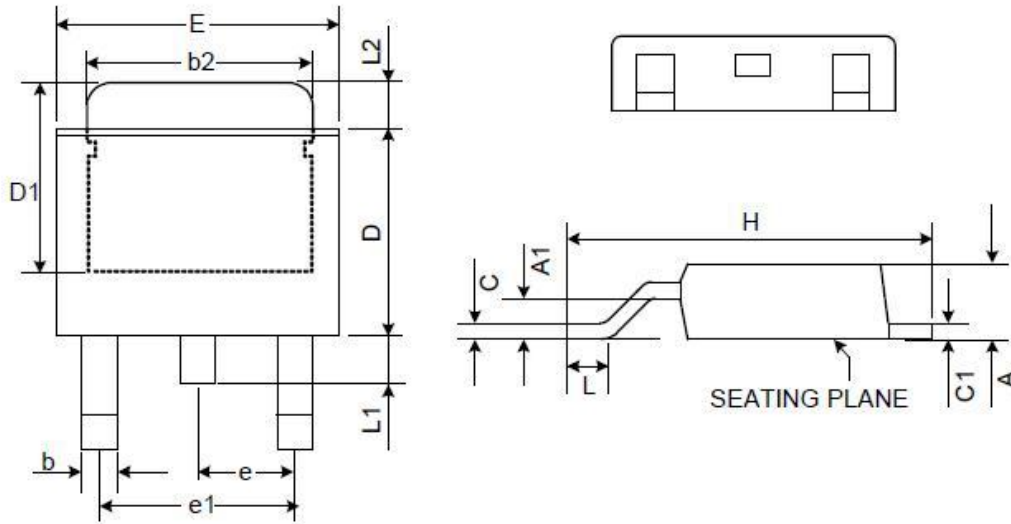


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

**❖ PACKAGE OUTLINES**


Symbol	Dimensions in Millimeters			Dimensions in Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	2.18	2.29	2.40	0.086	0.090	0.094
A1	0.89	-	1.14	0.035	-	0.045
b	0.61 TYP.			0.024 TYP.		
b2	5.20	5.35	5.50	0.205	0.211	0.217
C	0.45	0.52	0.58	0.018	0.020	0.023
C1	0.45	0.52	0.58	0.018	0.020	0.023
D	5.40	5.57	6.20	0.213	0.219	0.244
D1	4.57	4.77	4.97	0.180	0.188	0.196
E	6.35	6.58	6.80	0.250	0.259	0.268
e	2.28 BSC.			0.090 BSC.		
e1	4.57 BSC.			0.180 BSC.		
H	9.00	9.70	10.40	0.354	0.382	0.409
L	0.51	-	-	0.020	-	-
L1	0.64	0.83	1.02	0.025	0.033	0.040
L2	0.88	-	1.27	0.035	-	0.050

**Part Marking Information and Packing: TO-252**
**Laser Marking**
