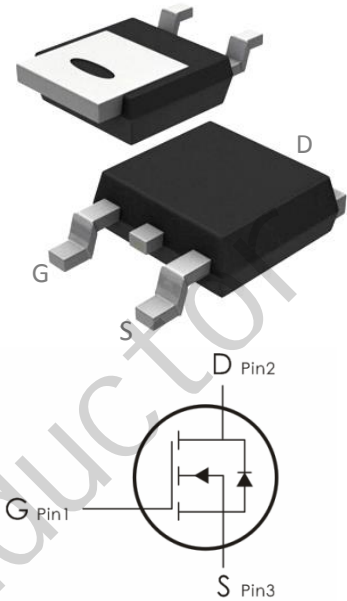


## Description:

This N-Channel MOSFET uses advanced trench technology and design to provide excellent  $R_{DS(on)}$  with low gate charge. It can be used in a wide variety of applications.



## Features:

- 1)  $V_{DS}=200V, I_D=9A, R_{DS(ON)} < 300m\Omega @ V_{GS}=10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra  $R_{DS(ON)}$ .
- 5) Excellent package for good heat dissipation.

## Absolute Maximum Ratings: ( $T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
$V_{DS}$	Drain-Source Voltage	200	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Continuous Drain Current- $T_C=25^\circ C$	9	A
	Continuous Drain Current- $T_C=100^\circ C$	5.6	
$I_{DM}$	Pulsed Drain Current	20	
$P_D$	Power Dissipation( $T_C=25^\circ C$ )	55	W
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ C$

## Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case <sup>2</sup>	2.3	$^\circ C/W$

**Electrical Characteristics:** ( $T_C=25^\circ\text{C}$  unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>Off Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	200	215	---	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=200V$	---	---	1	$\mu\text{A}$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	$\pm 100$	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	GATE-Source Threshold Voltage <sup>3</sup>	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	1	1.7	2.5	V
$R_{DS(ON)}$	Drain-Source On Resistance <sup>3</sup>	$V_{GS}=10V, I_D=4.5A$	---	260	300	m $\Omega$
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance <sup>4</sup>	$V_{DS}=25V, V_{GS}=0V, f=1\text{MHz}$	---	539	---	pF
$C_{oss}$	Output Capacitance <sup>4</sup>		---	89	---	
$C_{rss}$	Reverse Transfer Capacitance <sup>4</sup>		---	34	---	
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-On Delay Time <sup>4</sup>	$V_{DD}=150V, I_D=4.5A,$ $R_{GEN}=5\ \Omega$	---	6.3	---	ns
$t_r$	Rise Time <sup>4</sup>		---	10	---	ns
$t_{d(off)}$	Turn-Off Delay Time <sup>4</sup>		---	19	---	ns
$t_f$	Fall Time <sup>4</sup>		---	11	---	ns
$Q_g$	Total Gate Charge <sup>4</sup>	$V_{GS}=10V, V_{DS}=160V,$ $I_D=4.5A$	---	15	---	nC
$Q_{gs}$	Gate-Source Charge <sup>4</sup>		---	3.3	---	nC
$Q_{gd}$	Gate-Drain "Miller" Charge <sup>4</sup>		---	5	---	nC
<b>Drain-Source Diode Characteristics</b>						
$V_{SD}$	Source-Drain Diode Forward Voltage	$V_{GS}=0V, I_D=4.5A$	---	---	1.2	V
$I_S$	Continuous Drain Current	$V_D=V_G=0V$	---	---	9	A
$I_{SM}$	Pulsed Drain Current	$V_D=V_G=0V$	---	---	20	A

**Notes:**

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.
3. Pulse Test: Pulse Width  $\leq 300\ \mu\text{s}$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production

Typical Characteristics: ( $T_C=25^\circ\text{C}$  unless otherwise noted)

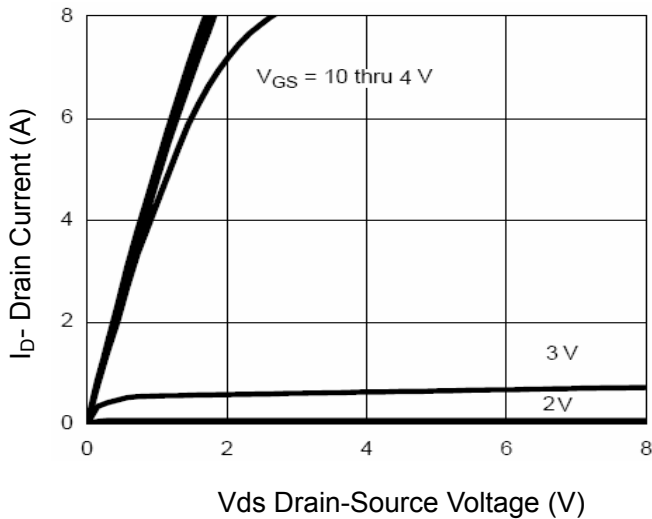


Figure 1 Output Characteristics

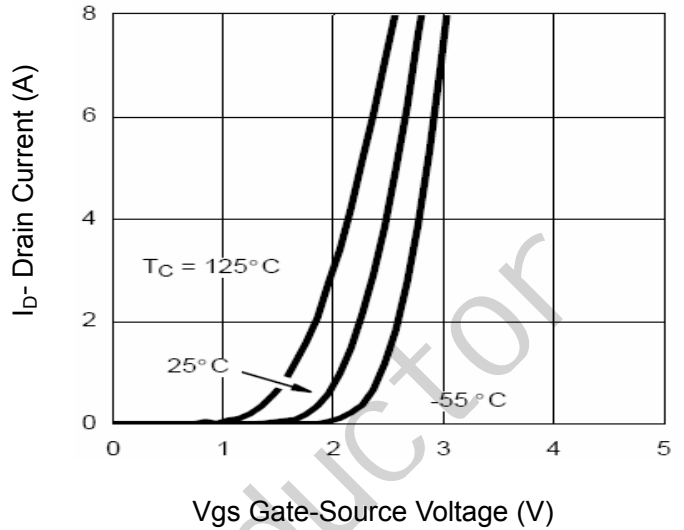


Figure 2 Transfer Characteristics

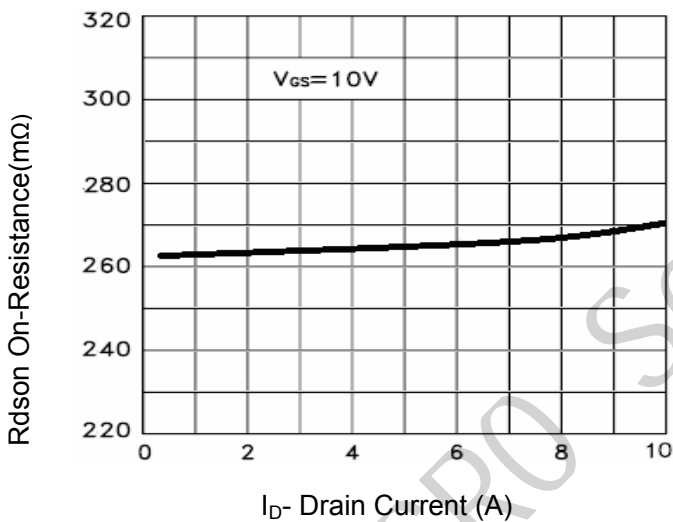


Figure 3 Rdson- Drain Current

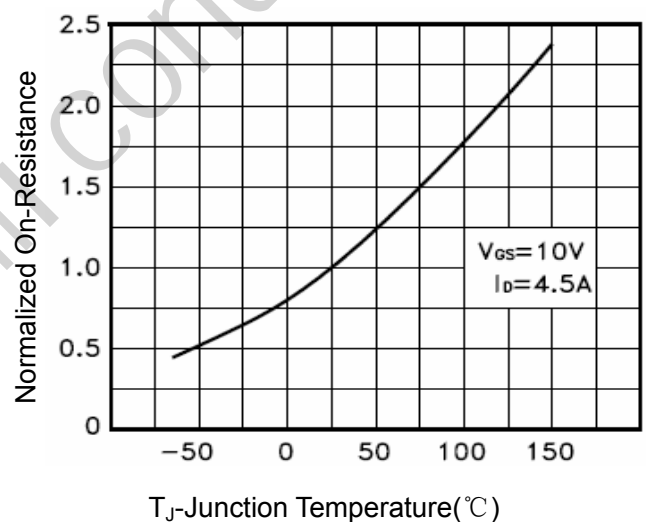


Figure 4 Rdson-Junction Temperature

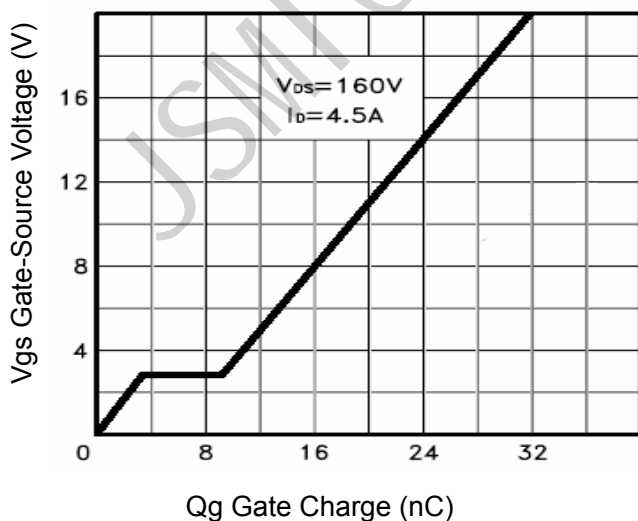


Figure 5 Gate Charge

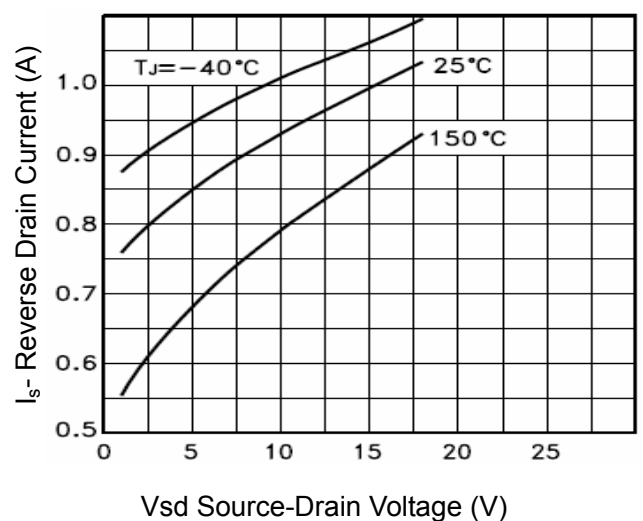


Figure 6 Source- Drain Diode Forward

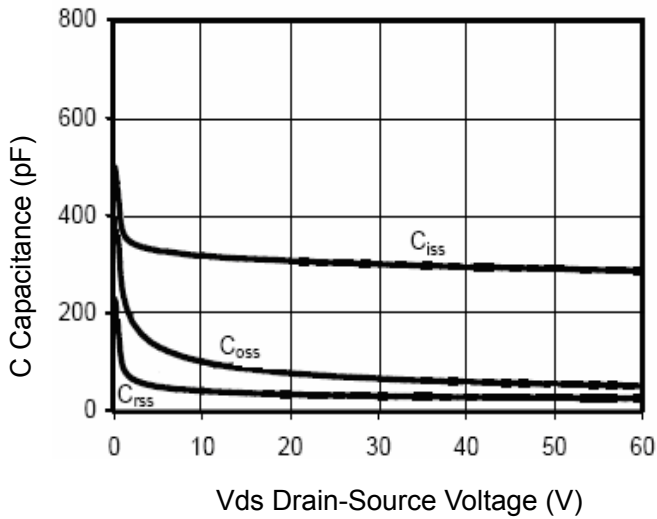


Figure 7 Capacitance vs Vds

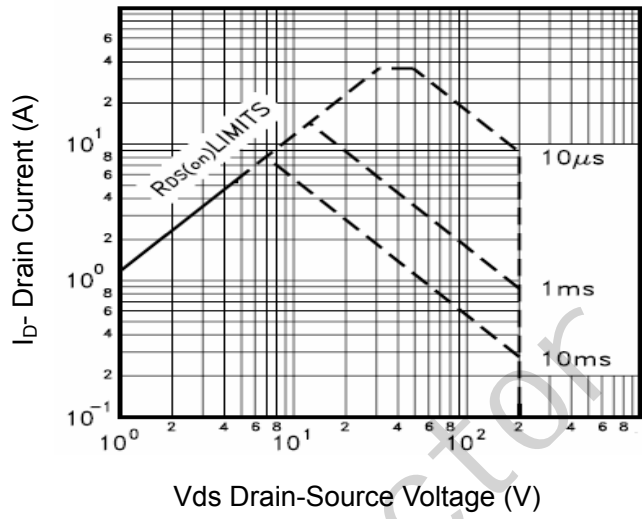


Figure 8 Safe Operation Area

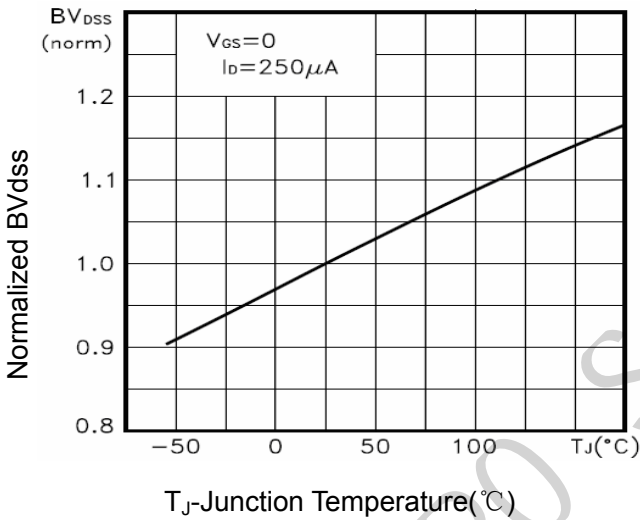


Figure 9 BV<sub>DSS</sub> vs Junction Temperature

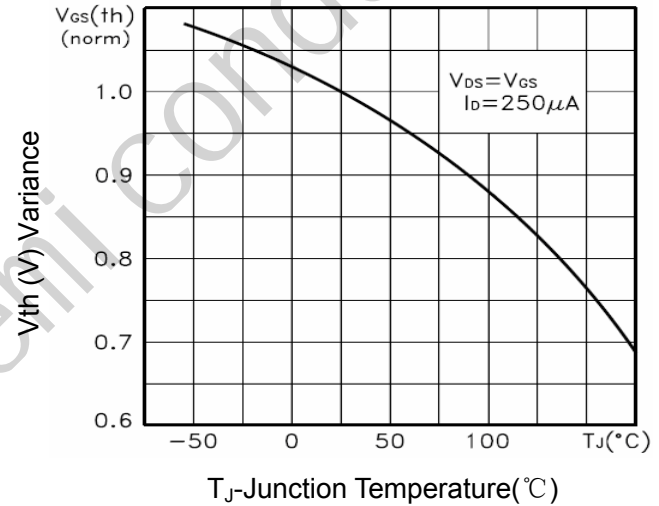


Figure 10 V<sub>GS(th)</sub> vs Junction Temperature

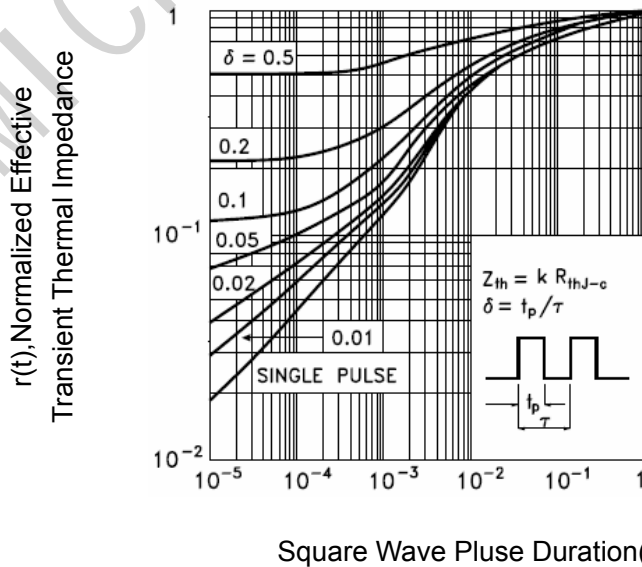
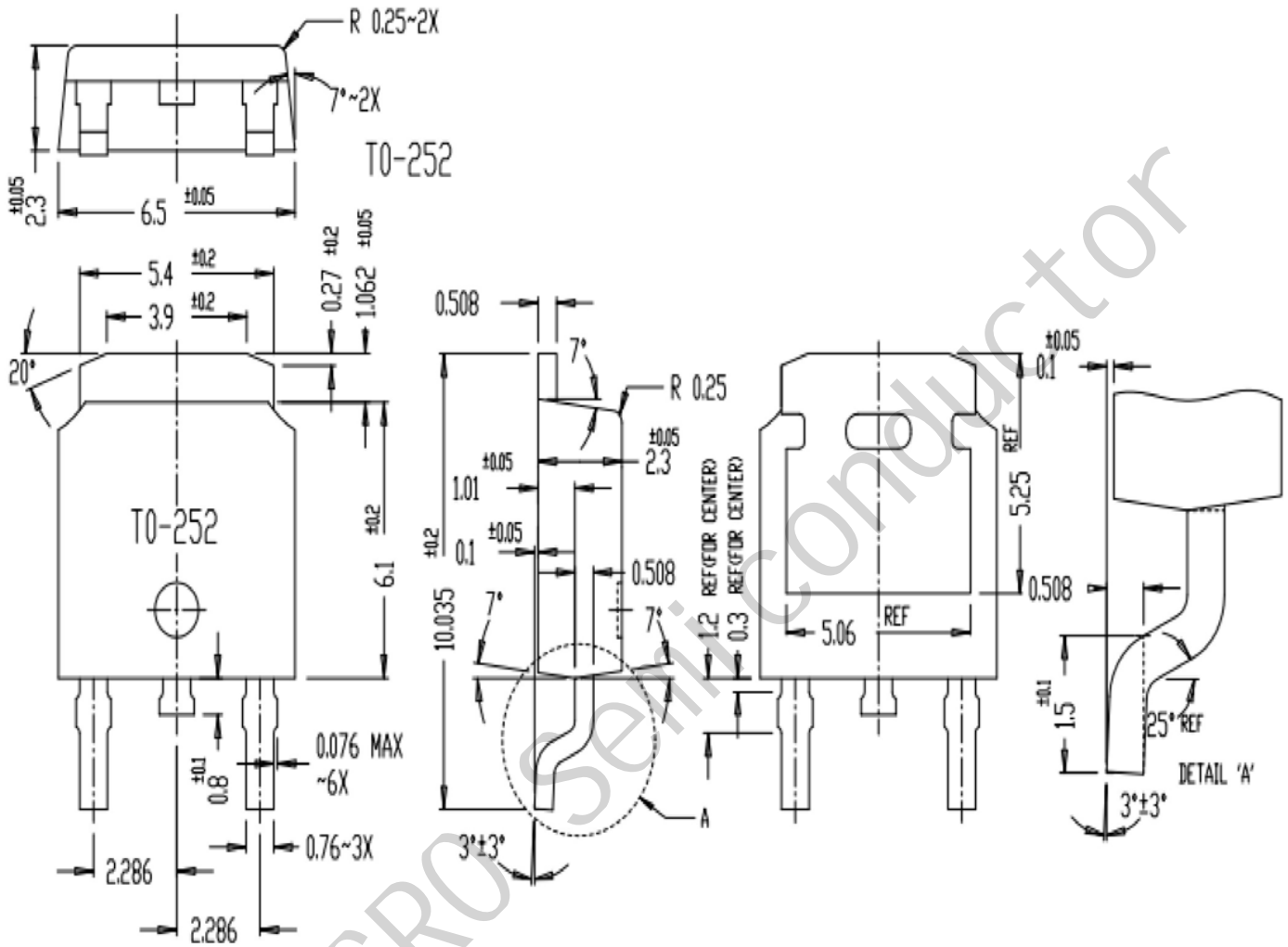


Figure 11 Normalized Maximum Transient Thermal Impedance

**Package Mechanical Data: TO-252-3L**



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