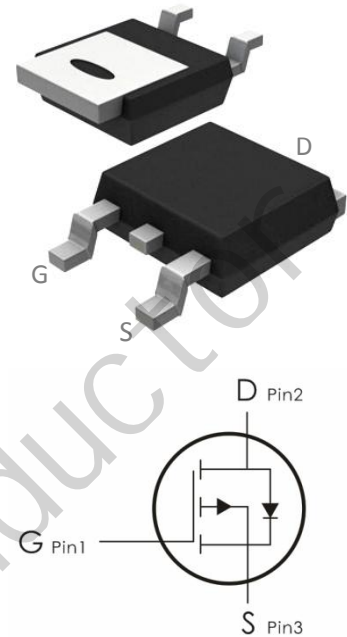


## Description:

This P-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)  $V_{DS}=-30V, I_D=-50A, R_{DS(ON)}<14m\Omega @V_{GS}=-10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low  $R_{DS(ON)}$ .
- 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	-30	V
$V_{GS}$	Gate-Source Voltage	$\pm 25$	V
$I_D$	Continuous Drain Current- $T_C=25^\circ C$	-50	A
	Continuous Drain Current- $T_C=100^\circ C$	-38	
$I_{DM (pulse)}$	Drain Current – Pulsed <sup>(Note 1)</sup>	-220	A
$P_D$	Power Dissipation- $T_C=25^\circ C$	75	W
	Power Dissipation- $T_C=100^\circ C$	37.5	
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-55 to +175	$^\circ C$

## Thermal Characteristics:

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

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

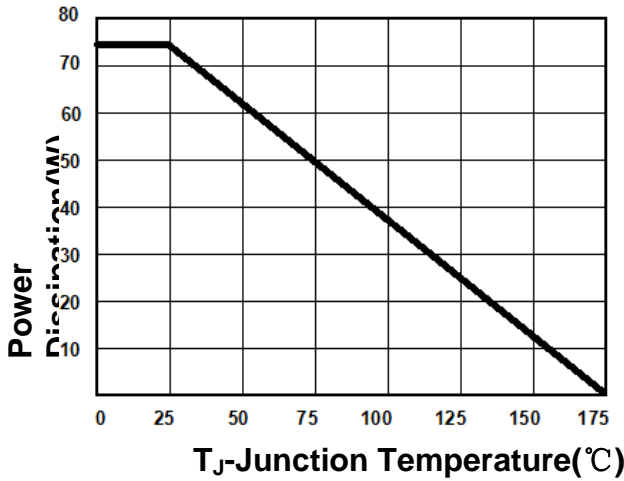
Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>Off Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	-30	---	---	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=-30V$	---	---	1	$\mu\text{A}$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 25V, V_{DS}=0A$	---	---	$\pm 100$	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	-1	-1.6	-2.5	V
$R_{DS(on)}$	Drain-Source On Resistance	$V_{GS}=-10V, I_D=-20A$	---	9.5	14	$m\ \Omega$
		$V_{GS}=-4.5V, I_D=-15A$	---	13	21	
$G_{FS}$	Forward Transconductance	$V_{DS}=-5V, I_D=-6A$	10	22	---	S
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, f=1\text{MHz}$	---	2350	---	pF
$C_{oss}$	Output Capacitance		---	380	---	
$C_{rss}$	Reverse Transfer Capacitance		---	285	---	
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}=-15V, I_D=-1A,$ $R_L=15\ \Omega, R_G=2.5\ \Omega,$ $V_{GS}=-10V$	---	11	---	ns
$t_r$	Rise Time		---	24	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	38	---	ns
$t_f$	Fall Time		---	10	---	ns
$Q_g$	Total Gate Charge	$V_{DS}=-15V, V_{GS}=-10V,$ $I_D=-12A$	---	40	---	nC
$Q_{gs}$	Gate-Source Charge		---	7.5	---	nC
$Q_{gd}$	Gate-Drain Charge		---	10	---	nC
<b>Drain-Source Diode Characteristics</b>						
$V_{SD}$	Source-Drain Diode Forward Voltage	$V_{GS}=0V, I_S=-6A$	---	---	-1.2	V

$I_{SD}$	Continuous Source Current	---	---	---	-55	A
----------	---------------------------	-----	-----	-----	-----	---

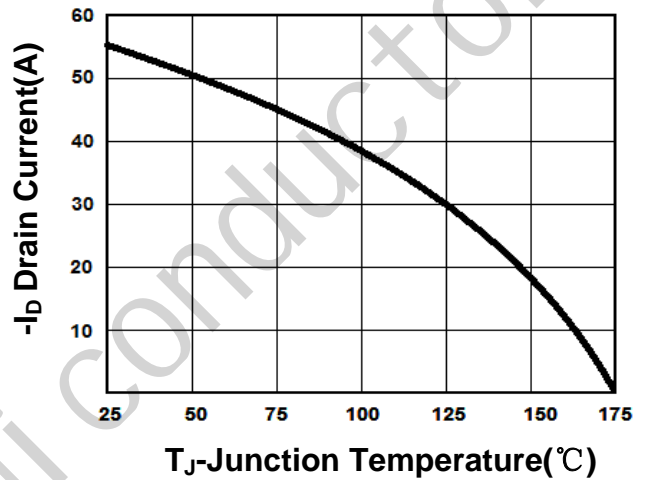
**Notes:** 1.Repetitive Rating: Pulse width limited by maximum junction temperature

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

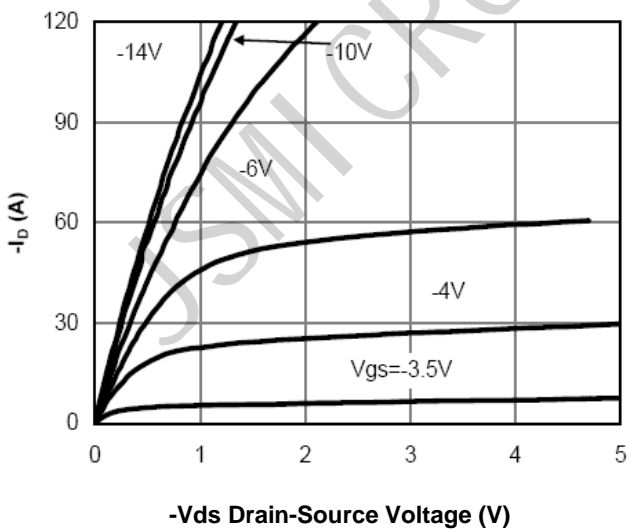
**Figure1. Power Dissipation**



**Figure2. Drain Current**



**Figure3. Output Characteristics**



**Figure4. Transfer Characteristics**

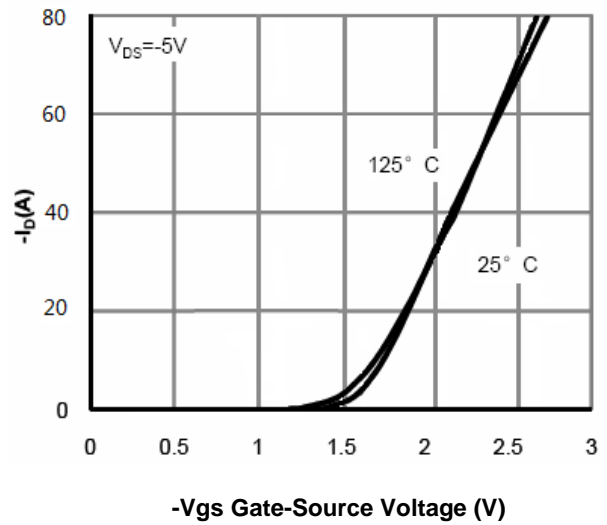


Figure5. Capacitance

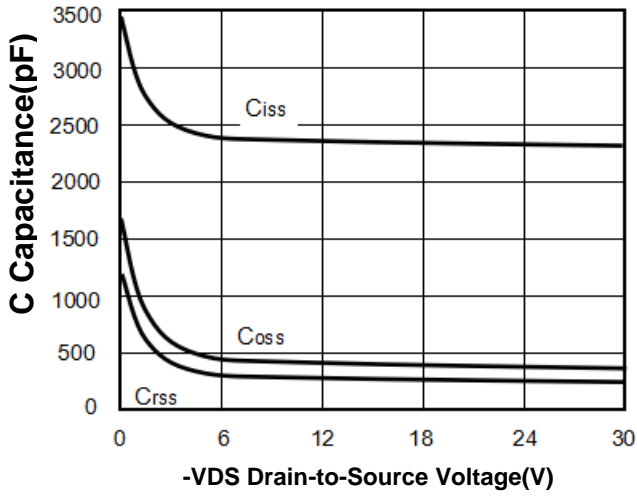


Figure6.  $R_{DS(ON)}$  vs Junction Temperature

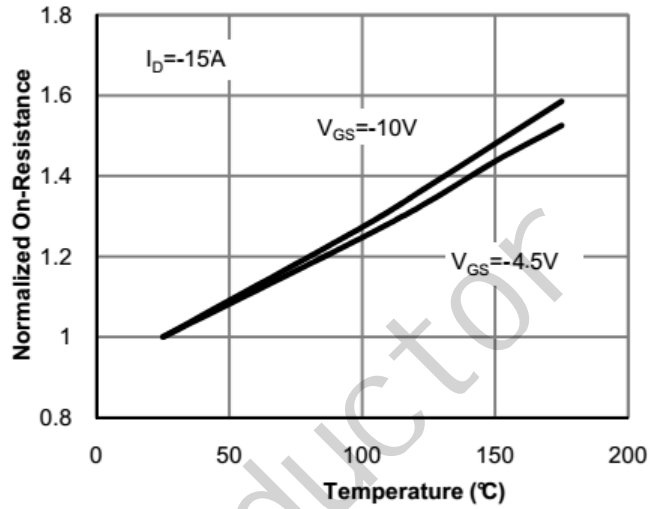


Figure7. Max  $BV_{DSS}$  vs Junction Temperature

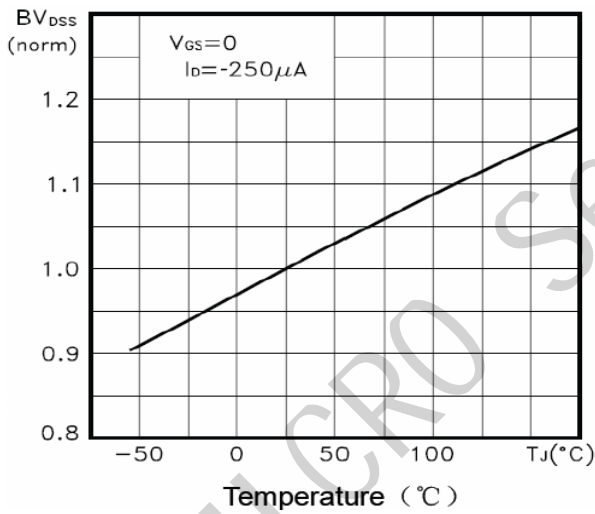


Figure8.  $V_{GS(th)}$  vs Junction Temperature

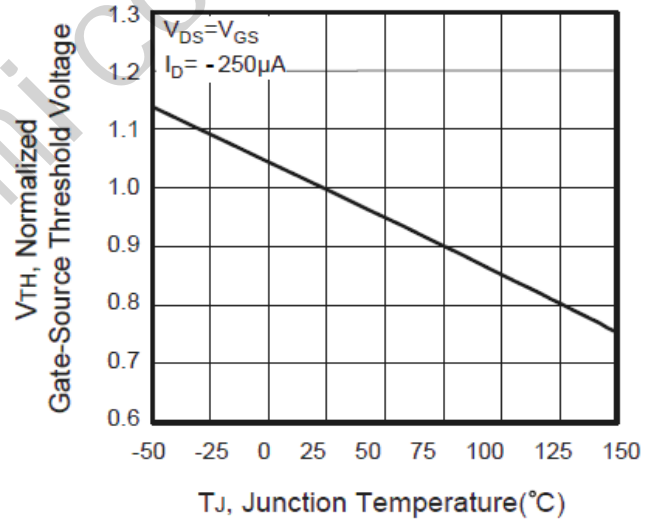


Figure9. Gate Charge Waveforms

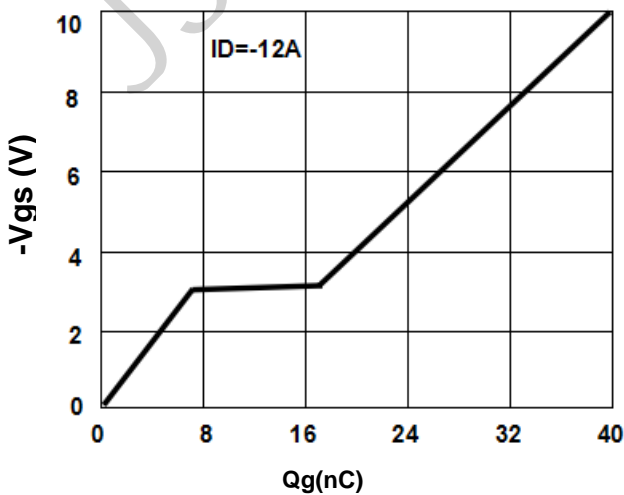


Figure10. Maximum Safe Operating Area

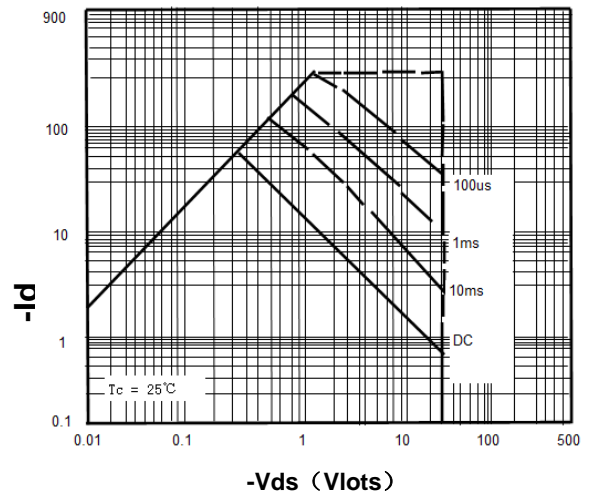
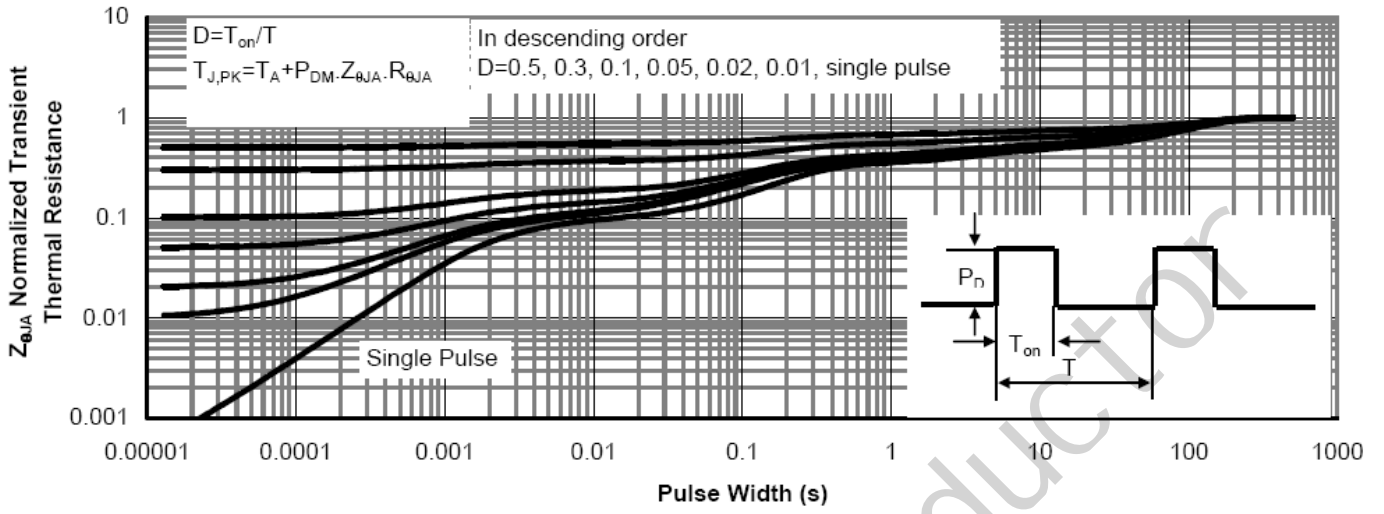
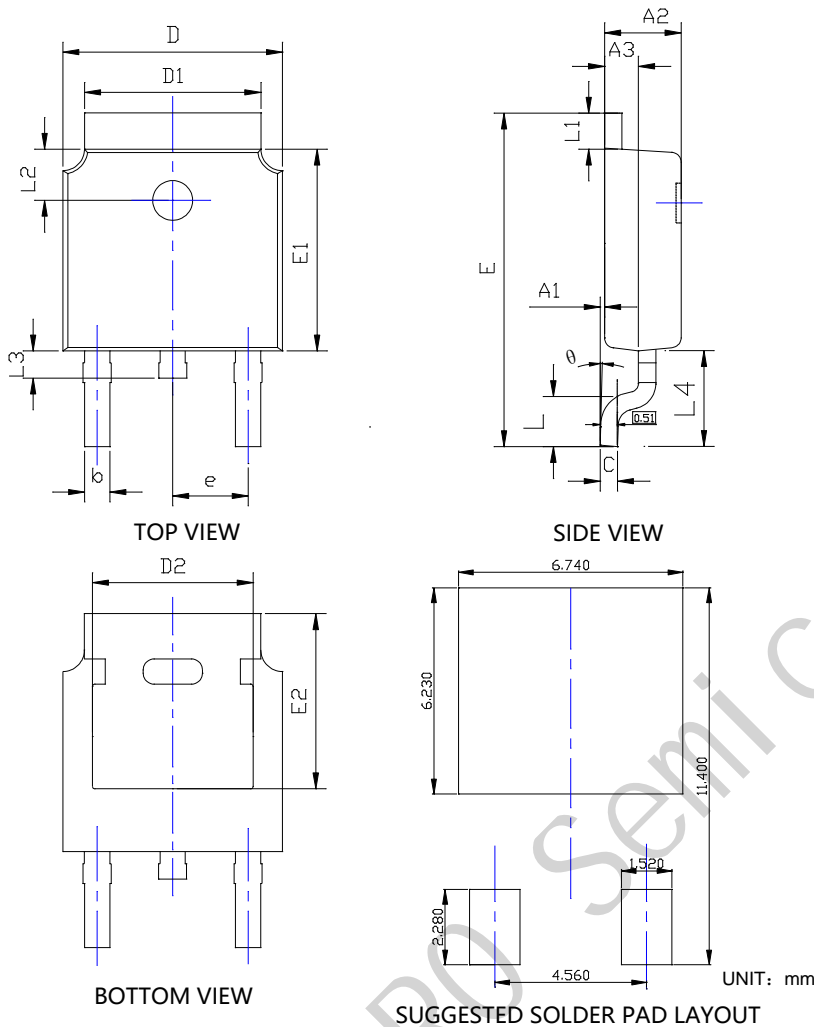


Figure11. Normalized Maximum Transient Thermal Impedance



**■ TO-252 Package information**


SYMBOL	DIMENSIONS					
	INCHES			Millimeter		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A1	0.000	---	0.008	0.000	---	0.200
A2	0.087	0.091	0.094	2.200	2.300	2.400
A3	0.035	0.039	0.043	0.900	1.000	1.100
b	0.026	0.030	0.034	0.660	0.760	0.860
c	0.018	0.020	0.023	0.460	0.520	0.580
D	0.256	0.260	0.264	6.500	6.600	6.700
D1	0.203	0.209	0.215	5.150	5.300	5.450
D2	0.181	0.189	0.195	4.600	4.800	4.950
E	0.390	0.398	0.406	9.900	10.100	10.300
E1	0.236	0.240	0.244	6.000	6.100	6.200
E2	0.203	0.209	0.215	5.150	5.300	5.450
e	0.090BSC			2.286BSC		
L	0.049	0.059	0.069	1.250	1.500	1.750
L1	0.035	---	0.050	0.900	---	1.270
L2	0.055	---	0.075	1.400	---	1.900
L3	0.240	0.310	0.039	0.600	0.800	1.000
L4	0.114REF			2.900REF		
$\theta$	0°	---	10°	0°	---	10°

**NOTE:**

1. PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
2. TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
3. THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.

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