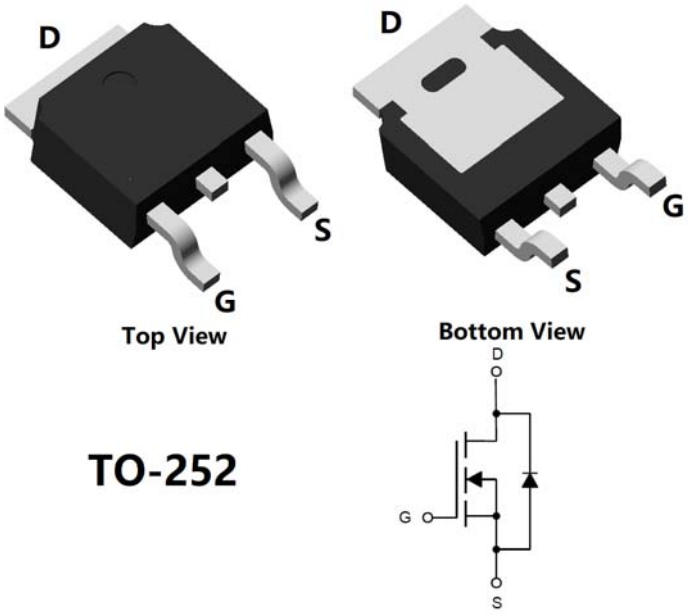
N-Channel Enhancement Mode Field Effect Transistor



Product Summary

- V_{DS} 20V
- I_D 60A
- $R_{DS(ON)}$(at V_{GS}=4.5V) ＜6.0mohm
- $R_{DS(ON)}$(at V_{GS}=2.5V) ＜8.8mohm
- $R_{DS(ON)}$(at V_{GS}=1.8V) ＜14mohm
- 100% EAS Tested
- 100% ▽VDS Tested

General Description

- Trench Power LV MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

Applications

- High current load applications
- Load switching
- Hard switched and high frequency circuits
- Uninterruptible power supply

■ Absolute Maximum Ratings (T_A=25℃unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	20	V
Gate-source Voltage		V_{GS}	±10	V
Drain Current	T_C=25℃	I_D	60	A
	T_C=100℃		38	
Pulsed Drain Current [A]		I_{DM}	210	A
Total Power Dissipation	T_C=25℃	P_D	29	W
	T_C=100℃		11	W
Single Pulse Avalanche Energy [B]		E_{AS}	68	mJ
Thermal Resistance Junction-to-Case [C]		$R_{\theta JC}$	4.3	℃/ W
Junction and Storage Temperature Range		T_J ,T_{STG}	-55～+150	℃

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
D60N02A	F1/F2	D60N02A	2500	/	25000	13“ reel

■ Electrical Characteristics (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=250μA	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V,V_{GS}=0V			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±10V, V_{DS}=0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA	0.45	0.62	1.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= 4.5V, I_D=20A		4.5	6.0	mΩ
		V_{GS}= 2.5V, I_D=15A		5.5	8.8	
		V_{GS}= 1.8V, I_D=10A		8.0	14	
Diode Forward Voltage	V_{SD}	I_S=20A,V_{GS}=0V			1.2	V
Maximum Body-Diode Continuous Current	I_S				60	A
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=10V,V_{GS}= 0V,f= 1MHz		2250		pF
Output Capacitance	C_{oss}			334		
Reverse Transfer Capacitance	C_{rss}			271		
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}= 4.5V,V_{DS}= 10V,I_D= 15A		27.9		nC
Gate-Source Charge	Q_{gs}			4.1		
Gate-Drain Charge	Q_{gd}			7.4		
Reverse Recovery Charge	Q_{rr}	I_F= 15A, di/dt= 100A/us		2.2		
Reverse Recovery Time	t_{rr}			16.3		ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}= 4.5V,V_{DD}= 10V, I_D= 10A,R_L= 1Ω R_{GEN}= 3Ω		13		
Turn-on Rise Time	t_r			53		
Turn-off Delay Time	$t_{D(off)}$			61		
Turn-off fall Time	t_f			76		

A. Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.

B. T_j=25℃, V_{DD}=18V, V_G=5V, L=0.5mH, R_g=25Ω, IAS=16.5A

C. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance, where the case thermal reference is defined as the soldermounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design, while $R_{\theta JA}$ is determined by the board design. The maximum rating presented here is based on mounting on a 1 in 2 pad of 2oz copper.

■ Typical Performance Characteristics

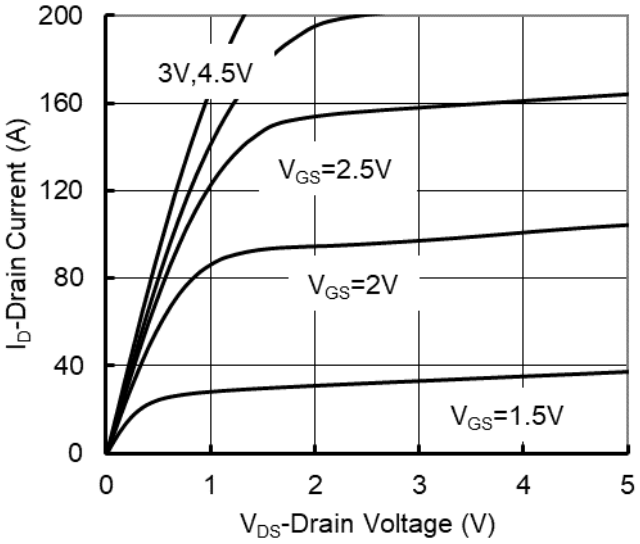


Figure1. Output Characteristics

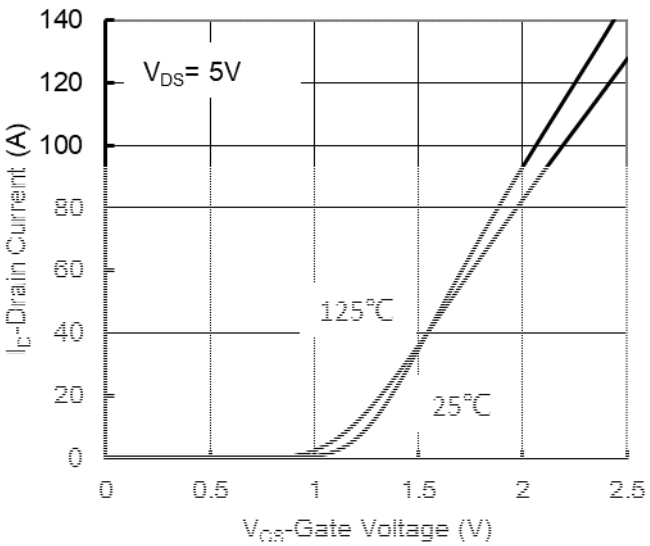


Figure2. Transfer Characteristics

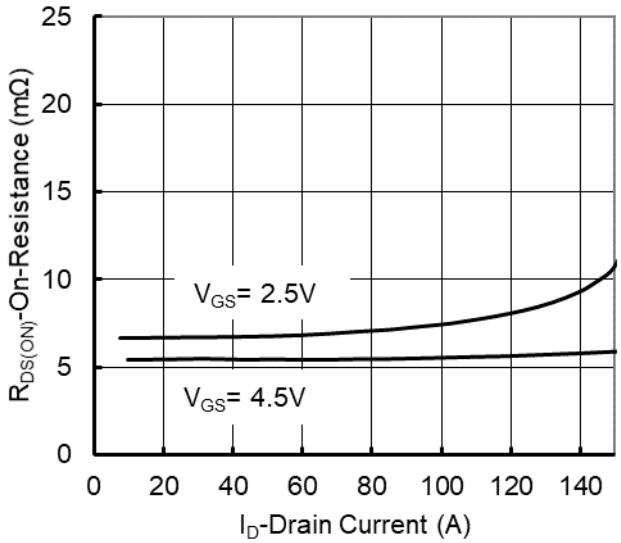


Figure3. On-Resistance vs. Drain Current

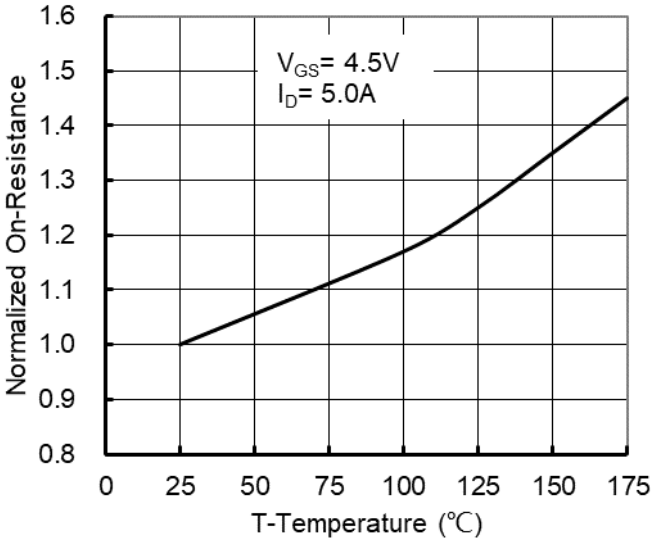


Figure4. Gate Charge

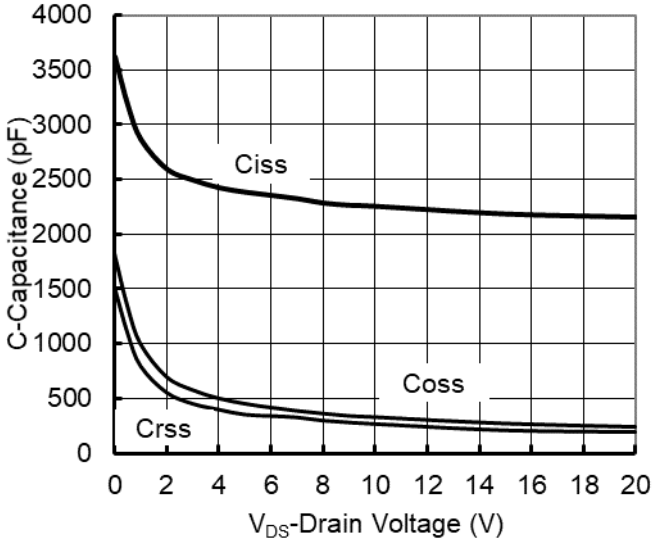


Figure5.Capacitance Characteristics

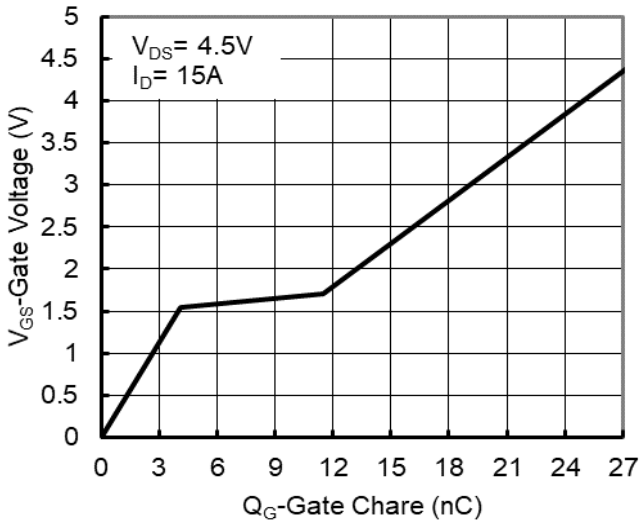


Figure6. Gate Charge

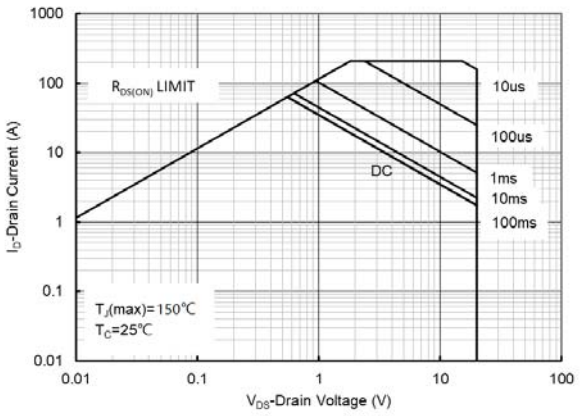


Figure7. Safe Operation Area

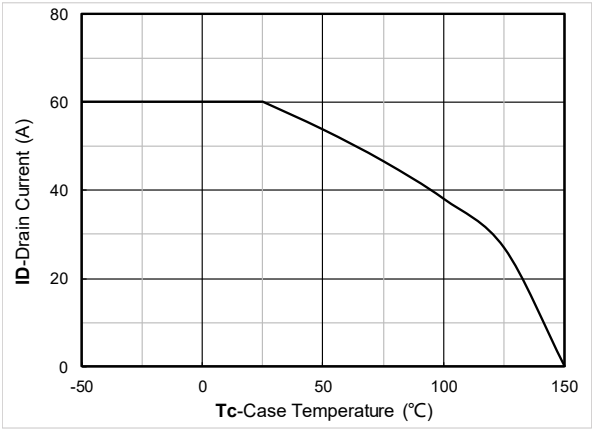


Figure8. Maximum Continuous Drain Current vs. Case Temperature

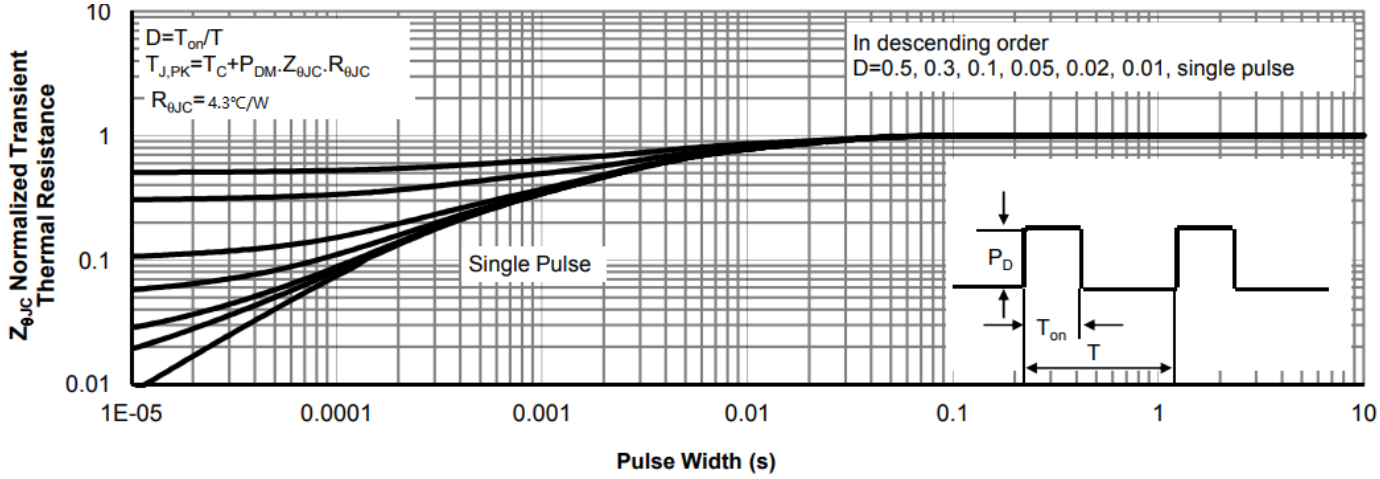
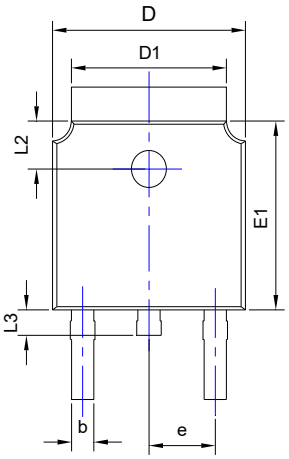
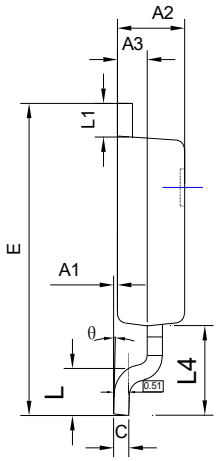


Figure9. Normalized Maximum Transient Thermal Impedance

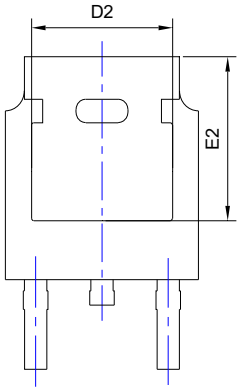
■ TO-252-B Package information



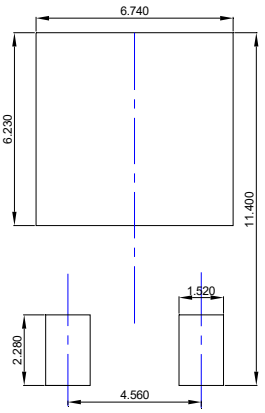
TOP VIEW



SIDE VIEW



BOTTOM VIEW



UNIT：mm

SUGGESTED SOLDER PAD LAYOUT

DIMENSIONS						
SYMBOL	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	0.024	0.031	0.039	0.600	0.800	1.000
L4	0.114REF			2.900REF		
θ	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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