

60V N-Channel Mosfet

FEATURES

- $R_{DS(ON)} \leq 4.0m\Omega$ (3.3m Ω Typ.)
@ $V_{GS}=10V$
- AEC Q101 qualified
- Green Product (RoHS compliant)

APPLICATIONS

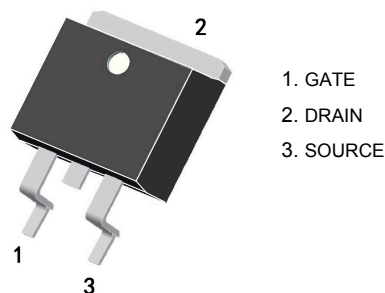
- Automotive systems
- Isolated DC-DC Converters
- Motor control
- Invertors

MARKING

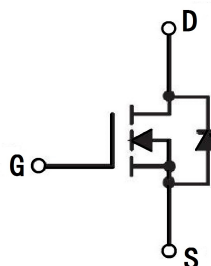


YYMM:Date Code(year & month)

TO-263-2L



N-CHANNEL MOSFET



MAXIMUM RATINGS (Tc=25°C unless otherwise noted)

Symbol	Parameter		Limit.	Units
V_{DSS}	Drain-Source Voltage		60	V
V_{GSS}	Gate-Source Voltage		± 20	V
I_D	Continuous Drain Current @ $V_{GS}=10V$ note1	$T_C = 25^\circ C$	160	A
		$T_C = 100^\circ C$	113	A
I_{DM}	Pulsed Drain Current note2		640	A
P_D	Power Dissipation		214	W
E_{AS}	Single Pulsed Avalanche Energy note3		500	mJ
$R_{\theta JC}$	Thermal Resistance, Junction to Case		0.7	$^\circ C/W$
T_J, T_{STG}	Operating And Storage Temperature Range		-55 to +175	$^\circ C$

MOSFET ELECTRICAL CHARACTERISTICS T_c=25 °C unless otherwise specified

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V,I _D = 250μA	60	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 60V, V _{GS} = 0V, T _J = 25°C	-	-	1	μA
I _{GSS}	Gate to Body Leakage Current	V _{GS} = ±20V,V _{DS} = 0V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} ,I _D = 250μA	2	2.6	4	V
R _{DS(on)}	Static Drain-Source On-Resistance ^{note4}	V _{GS} =10V, I _D =20A	-	3.3	4.0	mΩ
Dynamic Characteristics ^{note5}						
C _{iss}	Input Capacitance	V _{DS} =30V, V _{GS} = 0V f = 1.0MHz	-	4163	-	pF
C _{OSS}	Output Capacitance		-	898	-	pF
C _{rSS}	Reverse Transfer Capacitance			57	-	pF
Q _g	Total Gate Charge	V _{DS} =30V, I _D =20A V _{GS} =10V	-	64	-	nC
Q _{gs}	Gate-Source Charge		-	11.8	-	nC
Q _{gd}	Gate-Drain(“Miller”) Charge		-	9.7	-	nC
Switching Characteristics ^{note5}						
t _{d(on)}	Turn-On Delay Time	V _{GS} =10V, V _{DD} =30V R _G =2Ω, I _D =25A	-	22.3	-	ns
t _r	Turn-On Rise Time		-	6.6	-	ns
t _{d(off)}	Turn-Off Delay Time		-	80.2	-	ns
t _f	Turn-Off Fall Time		-	26.7	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} = 0V, I _{SD} =20A, T _J = 25°C	-	-	1.2	V

Notes: 1. T_c = 25 °C Limited only by maximum temperature allowed. Calculated continuous current based on maximum allowable junction temperature.

2. PW ≤ 10μs, Duty cycle ≤ 1%

3. V_{DD} = 50 V, R_G = 25Ω, L = 0.5mH, starting T_J = 25 °C.

4. Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 2%

5. Guaranteed by design, not subject to production testing

TYPICAL PERFORMANCE CHARACTERISTICS

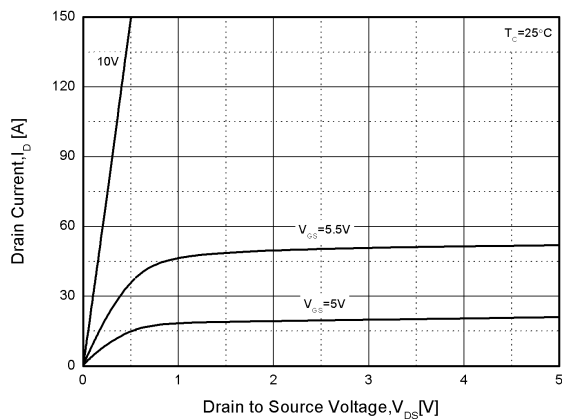


Figure1. Output Characteristics

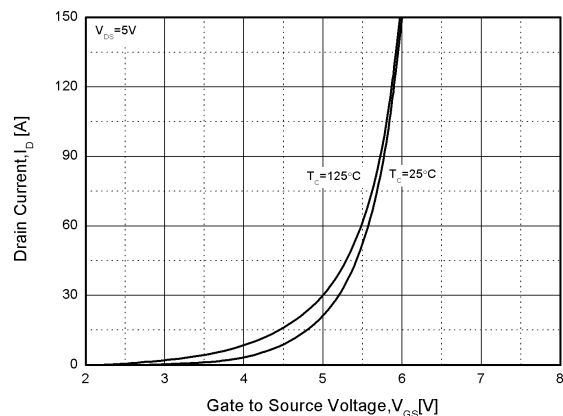


Figure2. Transfer Characteristics

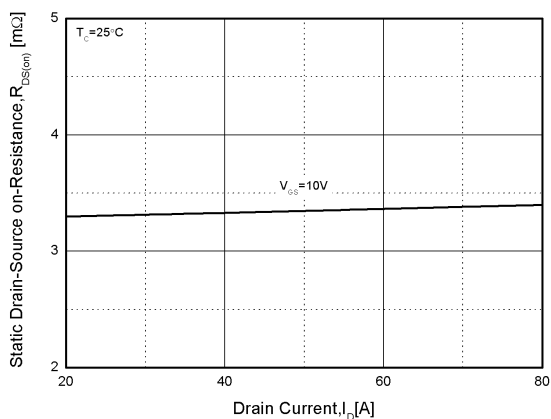


Figure3. Rdson-Drain Current

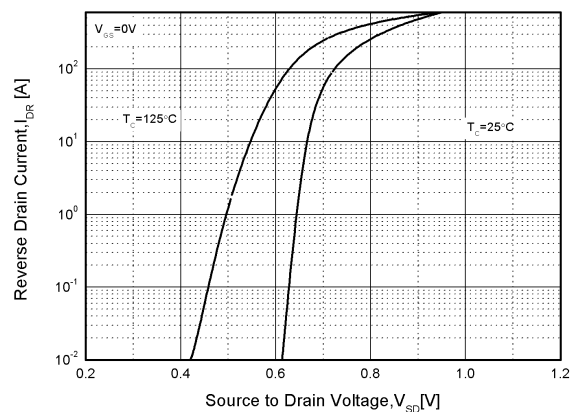


Figure4. Typical Source-Drain Diode Forward Voltage

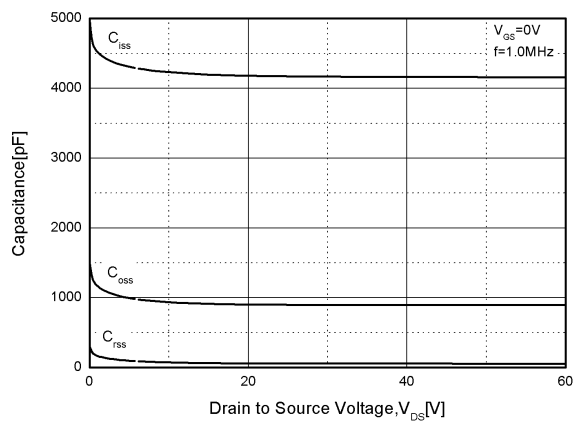


Figure5. Capacitance Characteristics

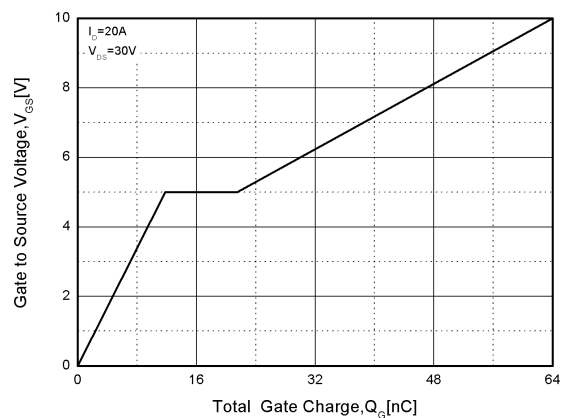


Figure6. Gate Charge

TYPICAL PERFORMANCE CHARACTERISTICS (cont.)

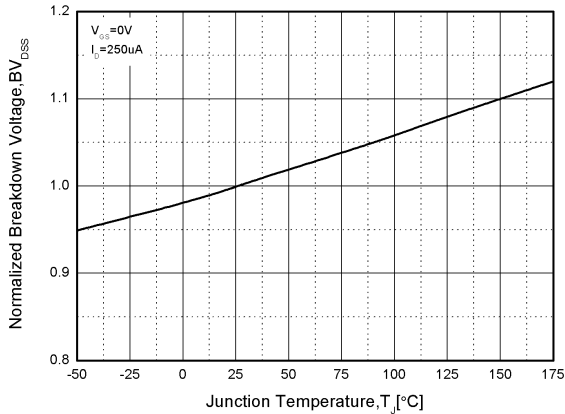


Figure7. Normalized Breakdown Voltage vs. Temperature

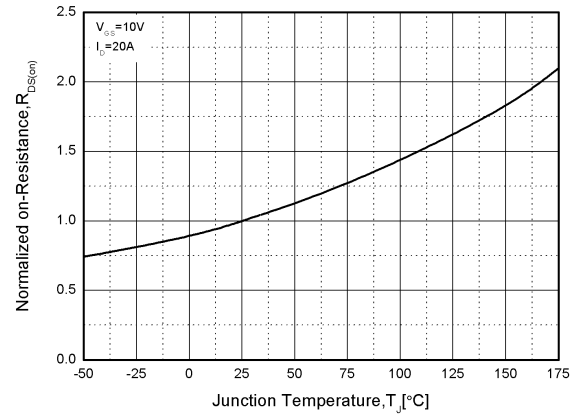


Figure8. Normalized on Resistance vs. Temperature

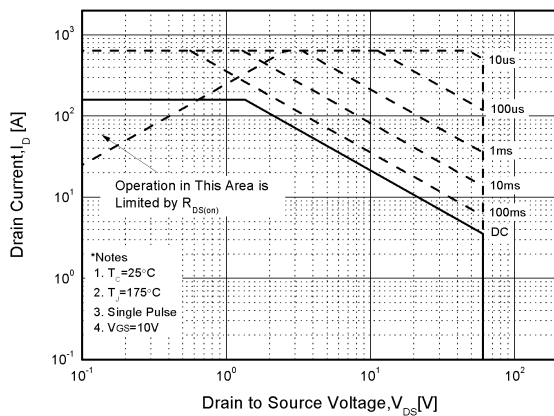


Figure9. Safe Operation Area

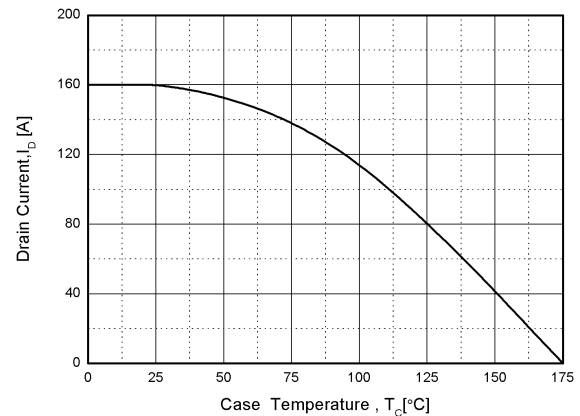


Figure10. Maximum Drain Current vs. Case Temperature

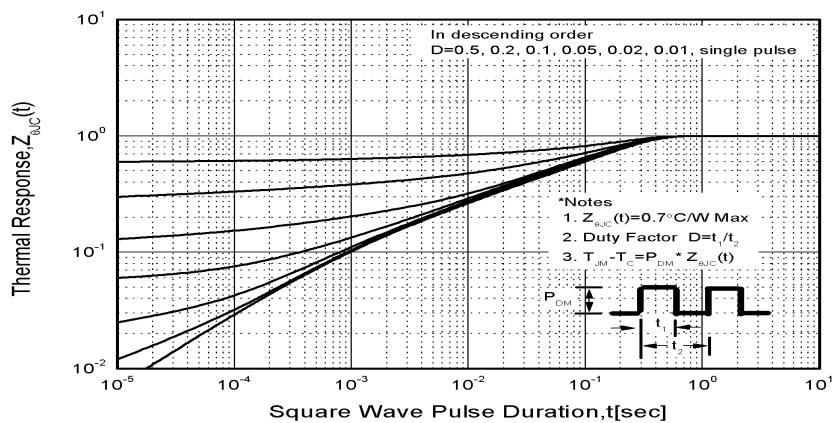
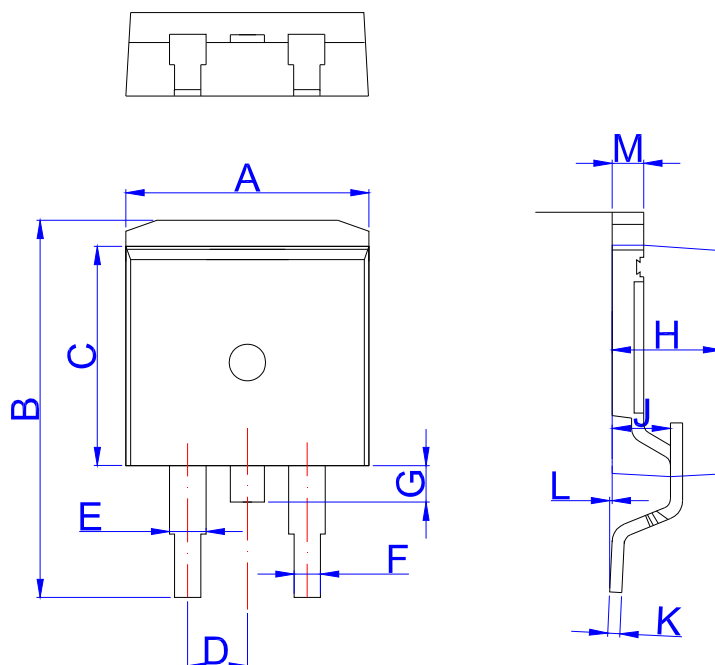


Figure11. Transient Thermal Response Curve

TO-263-2L PACKAGE OUTLINE DRAWING



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.90		10.20	0.390		0.402
B	14.70		15.80	0.579		0.622
C	9.4		9.6	0.37		0.378
D		2.54			0.100	
E	1.20		1.4	0.047		0.055
F	0.75		0.85	0.029		0.033
G			1.75			0.069
H	4.40		4.70	0.173		0.185
J	2.30		2.70	0.091		0.106
K	0.38		0.55	0.015		0.022
L	0	0.10	0.25	0	0.004	0.010
M	1.25		1.35	0.049		0.053