

N-Channel Enhancement Mode MOSFET

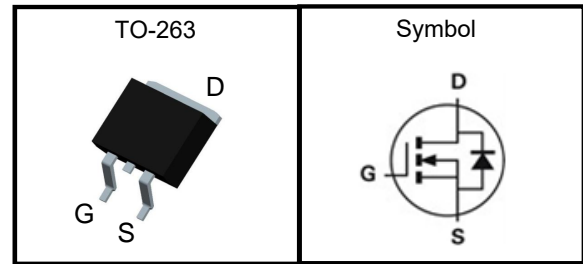
Feature

- Optimized high performance of R_{on} and Q_g
- Reliable and Rugged
- ROHS Compliant & Halogen-Free
- 100% UIS and Rg Tested

Applications

- DC-DC Converter
- Load Switching

Pin Description



V_{DSS}	120	V
$R_{DS(ON)-Max}$	4.0	m Ω
I_D	230	A

Absolute Maximum Ratings (T_J=25°C Unless Otherwise Noted)

Symbol	Parameter	N-Channel	Unit	
V_{DSS}	Drain-Source Voltage	120	V	
V_{GSS}	Gate-Source Voltage	±20		
T_J	Maximum Junction Temperature	175	°C	
T_{STG}	Storage Temperature Range	-55 to 175	°C	
$I_{DM}^{①}$	Pulse Drain Current Tested	$T_c=25^\circ\text{C}$	920	A
I_D	Continuous Drain Current	$T_c=25^\circ\text{C}$	230	A
		$T_c=100^\circ\text{C}$	163	
P_D	Maximum Power Dissipation	$T_c=25^\circ\text{C}$	385	W
		$T_c=100^\circ\text{C}$	192	
$E_{AS}^{②}$	Avalanche Energy, Single pulse	L=0.5mH	400	mJ

Thermal Characteristics

Symbol	Parameter	Rating	Unit	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	Steady State	0.39	°C/W
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	Steady State	62.5	°C/W

Note ① : Max. current is limited by bonding wire

Note ② : UIS tested and pulse width are limited by maximum junction temperature 150°C

Note ③ : Surface Mounted on 1in² FR-4 board with 1oz.



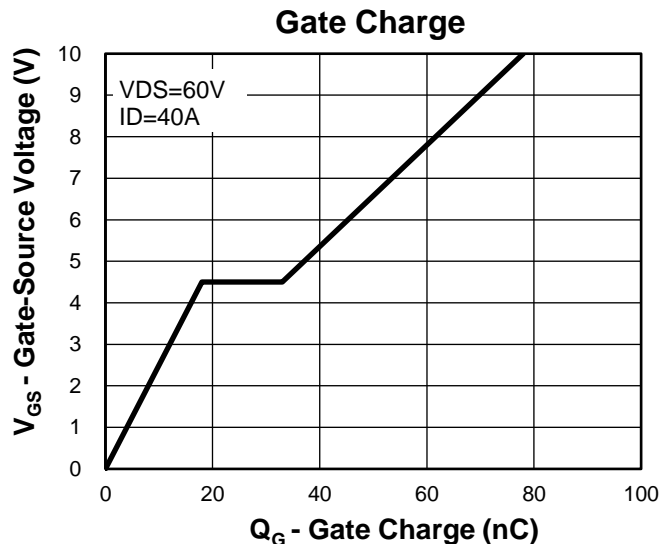
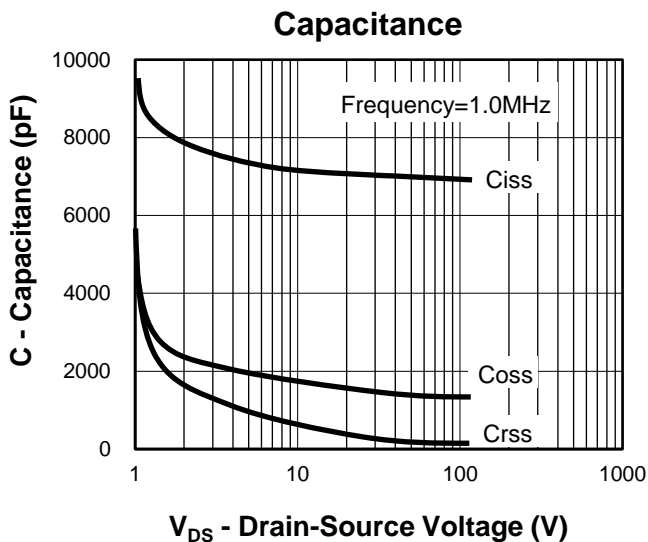
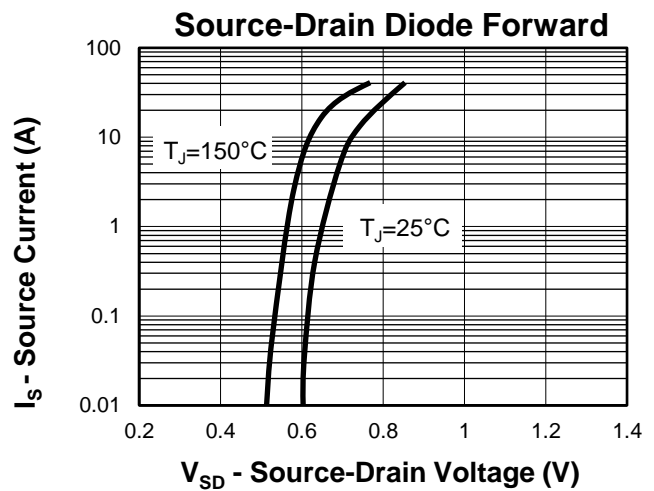
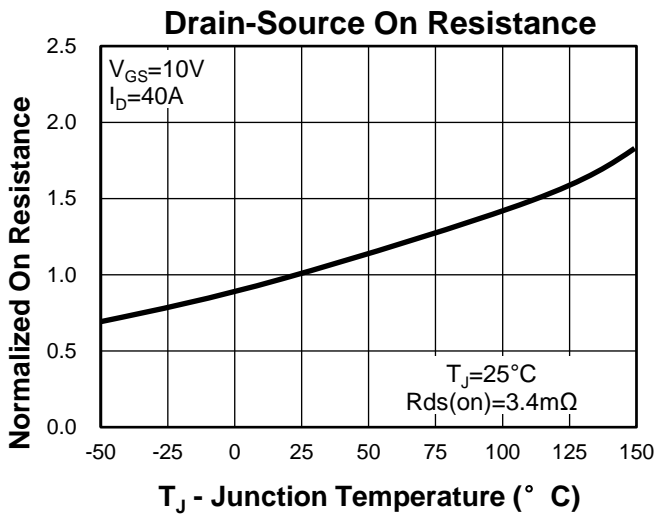
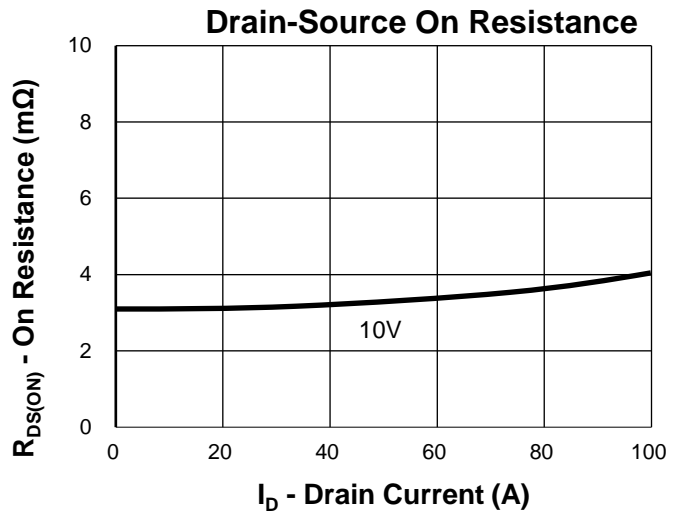
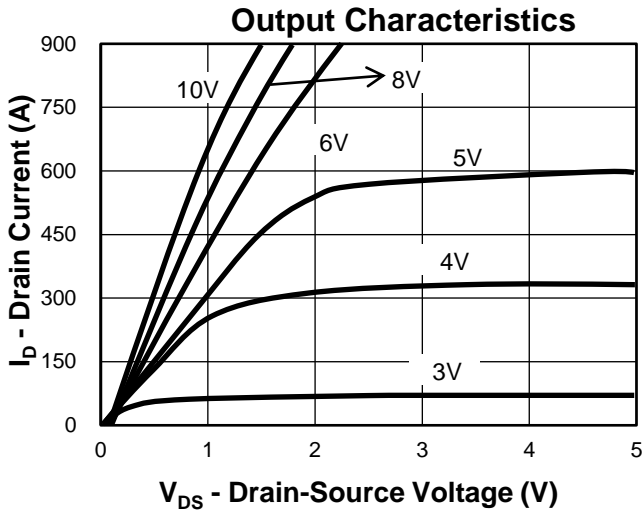
N-Channel Enhancement Mode MOSFET

N-Channel Electrical Characteristics (T_J=25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250uA	120	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V _{DS} =120V, V _{GS} =0V	-	-	1	uA
V_{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250uA	2	3	4	V
I_{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
R_{DS(ON)}^④	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =40A	-	3.4	4	mΩ
gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =50A	-	95	-	S
Dynamic Characteristics^⑥						
R_G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, Freq.=1MHz	-	2.3	-	Ω
C_{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =60V, Freq.=1MHz	-	6955	-	pF
C_{OSS}	Output Capacitance		-	1630	-	
C_{rss}	Reverse Transfer Capacitance		-	70	-	
t_{d(ON)}	Turn-on Delay Time	V _{GS} =10V, V _{DD} =60V, I _D =40A, R _{GEN} =3Ω	-	18	-	nS
t_r	Turn-on Rise Time		-	24	-	
t_{d(OFF)}	Turn-off Delay Time		-	55	-	
t_f	Turn-off Fall Time		-	29	-	
Q_g	Total Gate Charge	V _{GS} =4.5V, V _{DS} =60V, I _D =40A	-	35	-	nC
Q_g	Total Gate Charge	V _{GS} =10V, V _{DS} =60V, I _D =40A	-	78	-	
Q_{gs}	Gate-Source Charge		-	17.5	-	
Q_{gd}	Gate-Drain Charge		-	14.5	-	
Source-Drain Characteristics						
V_{SD}^④	Diode Forward Voltage	I _D =40A, V _{GS} =0V	-	0.8	1.2	V
t_{rr}	Reverse Recovery Time	I _F =40A, dI _F /	-	54	-	nS
Q_{rr}	Reverse Recovery Charge	dt=100A/μs	-	78	-	nC

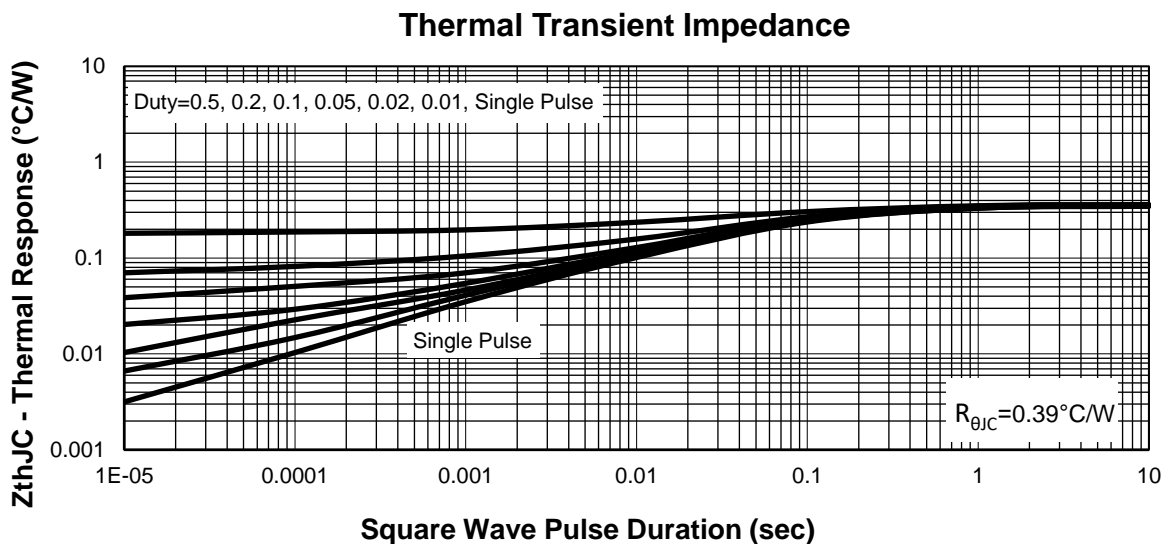
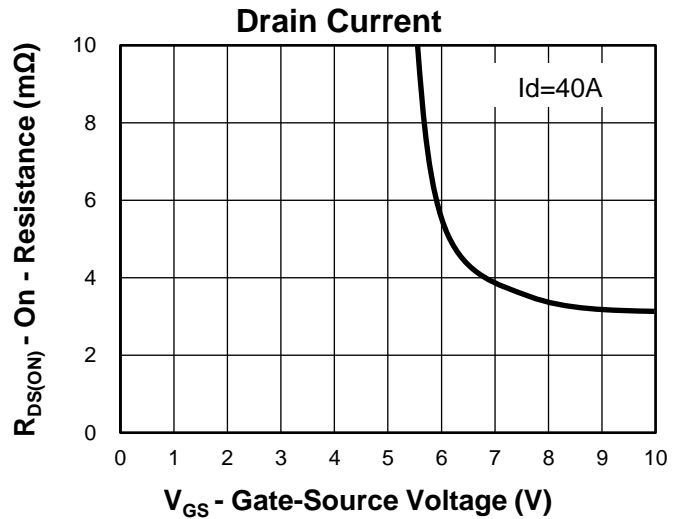
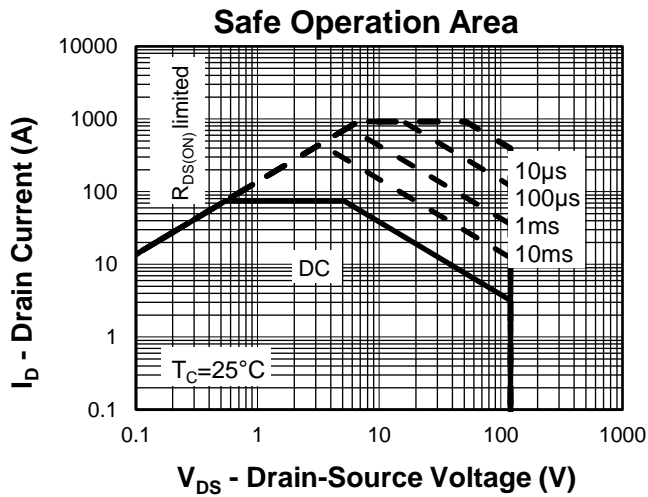
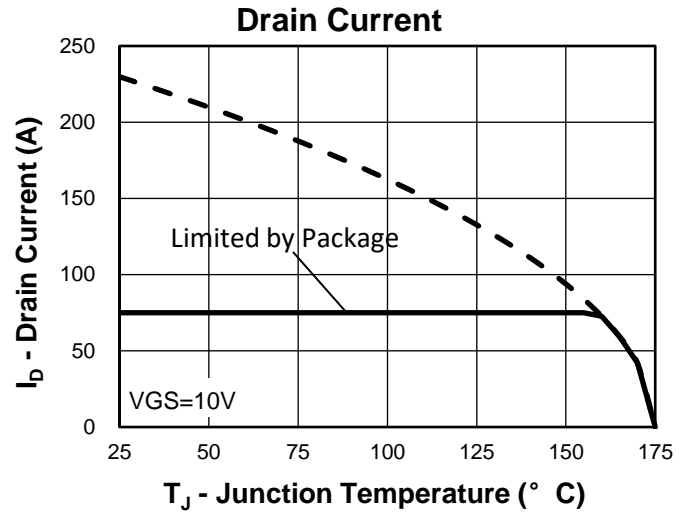
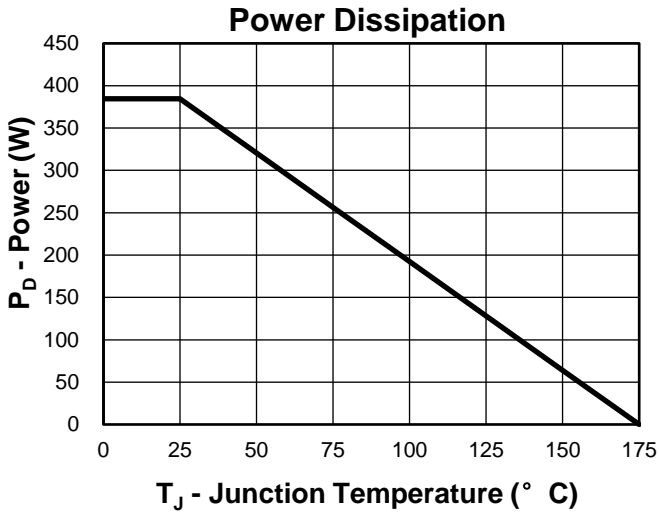
Note ④ : Pulse test (pulse width≤300us, duty cycle≤2%).

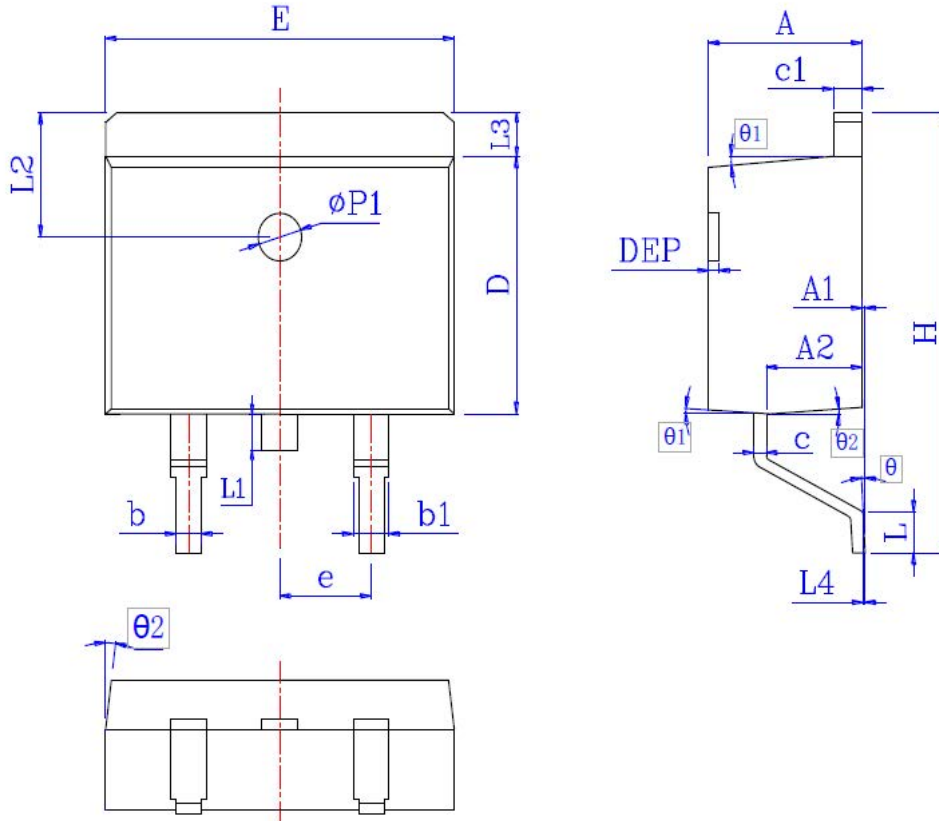
Note ⑤ : Guaranteed by design, not subject to production testing.

N-Channel Enhancement Mode MOSFET
N-Channel Typical Characteristics




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TO-263 Package Outline Data


SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	4.40	4.55	4.72	0.173	0.179	0.186	L	1.94	2.30	2.60	0.076	0.091	0.102
A1	0.00	0.10	0.25	0.000	0.005	0.010	L3	1.17	1.29	1.40	0.046	0.051	0.055
A2	2.59	2.69	2.79	0.102	0.106	0.110	L1	*	*	1.70	*	*	0.067
b	0.76	*	0.90	0.030	*	0.035	L4	0.25 BSC			0.01 BSC		
b1	1.22	*	1.36	0.048	*	0.054	L2	2.50 REF			0.098 REF		
c	0.33	*	0.47	0.013	*	0.019	θ	0°	*	8°	0°	*	8°
c1	1.22	*	1.32	0.048	*	0.052	θ1	5°	7°	9°	5°	7°	9°
D	8.60	*	9.29	0.339	*	0.366	θ2	1°	3°	5°	1°	3°	5°
E	9.95	*	10.26	0.392	*	0.404	DEP	0.05	0.10	0.20	0.002	0.004	0.008
e	2.54BSC			0.100BSC			Φp1	1.40	1.50	1.60	0.055	0.059	0.063
H	14.70	15.10	15.79	0.579	0.594	0.622							