N-Channel 60 V (D-S) MOSFET

PRODUCT SUMMARY

BV_{DSS}	60V
$R_{DSON(MAX.)}$	0.0032Ω
I_D	180A

FEATURES

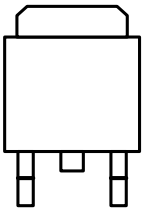
- 100 % R_g Tested
- 100 % UIS Tested
- Material categorization

RoHS COMPLIANT
HALOGEN FREE

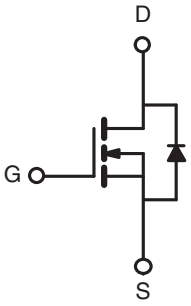
APPLICATIONS

- DC-DC Converters
- Power management functions
- Synchronous-rectification applications

TO-263



Top View



N-Channel MOSFET

Absolute Maximum Ratings (T_C = 25 °C, unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current@10V	T_C = 25 °C	I_D	180	A
	T_C = 100 °C		101	
Pulsed Drain Current		I_{DM}	641	A
Single Pulse Avalanche Energy	L = 0.1 mH	E_{AS}	189	mJ
Total Power Dissipation	T_C = 25 °C	P_D	112.6	W
Operating Junction and Storage Temperature Range		T_J , T_{STG}	-55 to +150	°C

Thermal Characteristics

Parameter	Symbol	LIMIT.	Unit
Thermal resistance, junction-to-ambient	$R_{\theta}JA$	39.4	°C / W
Thermal resistance, junction-to-case	$R_{\theta}JC$	1.1	

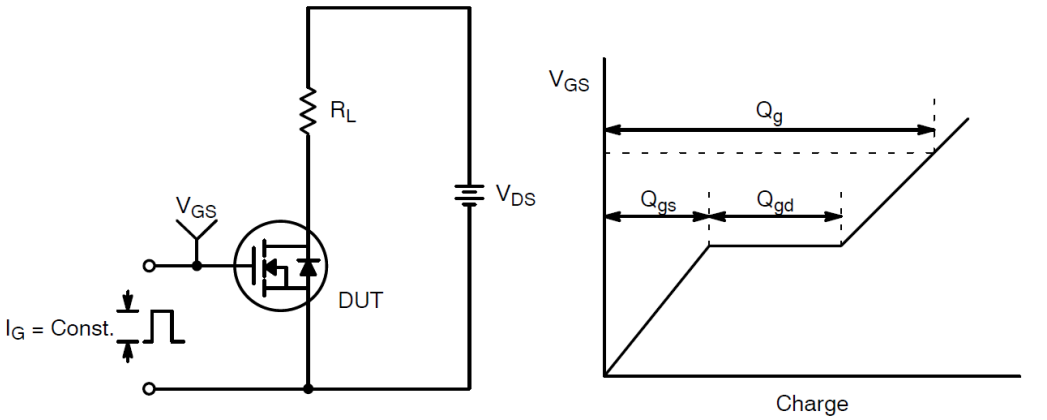
Electrical Characteristics T_J = 25°C, unless otherwise noted

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V , I_D = 250 μA	60	-	-	V
Gate-body Leakage current	I_{GSS}	V_{DS} = 0 V , V_{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 60 V , V_{GS} = 0 V , T_J = 25 °C	-	-	1	μA
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS} , I_D = 250 μA	1		3	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10 V , I_D = 20 A	-	0.0025	0.0032	Ω
		V_{GS} = 4.5 V , I_D = 10 A	-	0.0029	0.0036	
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 30 V , V_{GS} = 0 V , f = 1 MHz	-	4612	-	pF
Output Capacitance	C_{oss}		-	2190	-	
Reverse Transfer Capacitance	C_{rss}		-	68	-	
Switching Characteristics						
Gate Resistance	R_g	f = 1 MHz	-	0.93	-	Ω
Total Gate Charge	Q_g	V_{DS} = 30 V , V_{GS} = 10 V , I_D = 40 A	-	74.39	-	nC
Gate-Source Charge	Q_{gs}		-	17.28	-	
Gate-Drain Charge	Q_{gd}		-	9.46	-	
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 30 V , I_D ≅ 40 A , V_{GEN} = 10 V , R_G = 2.7 Ω	-	14.15	-	nS
Rise Time	t_r		-	63.75	-	
Turn-Off Delay Time	$t_{d(off)}$		-	47	-	
Fall Time	t_f		-	105.09	-	
Drain-Source Body Diode Characteristics						
Diode Forward Voltage	V_{SD}	I_S = 40 A , V_{GS} = 0 V	-	1	1.5	V
Continuous Source-Dranin Diode Current	I_S	T_J = 25 °C	-	-	180	A
Continuous Source Current	I_{SM}		-	-	360	A
Reverse Recovery Charge	Q_{rr}	T_J = 25 °C , I_F = 40 A , dI/dt = 300 A/μs	-	56.33	-	nC
Reverse Recovery Time	t_{rr}		-	53	-	ns

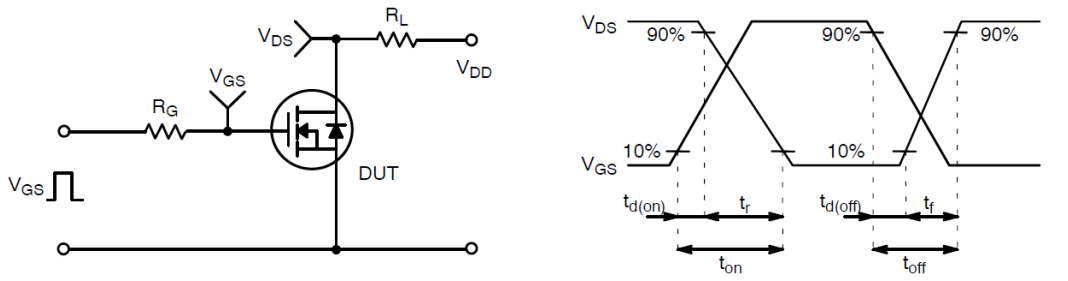
Notes：

a. Repetitive rating; pulse width limited by maximum junction temperature.

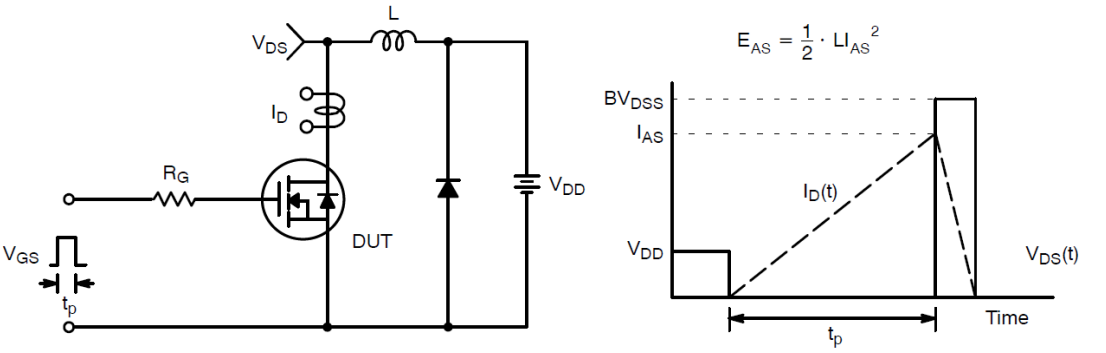
b. V_{DD}=30V, L=0.3mH, R_g=25Ω, Starting T_J=25 °C.



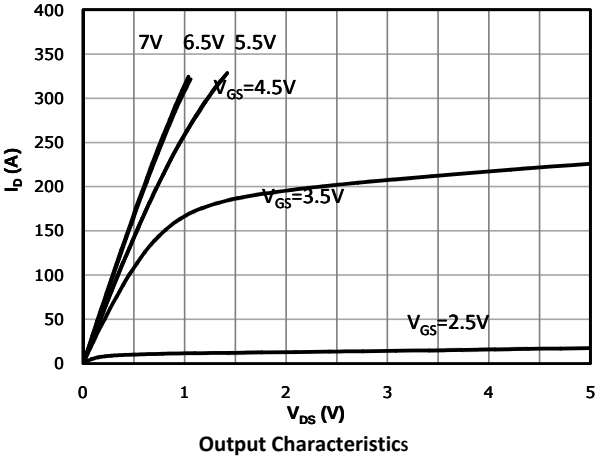
Gate Charge Test Circuit & Waveform



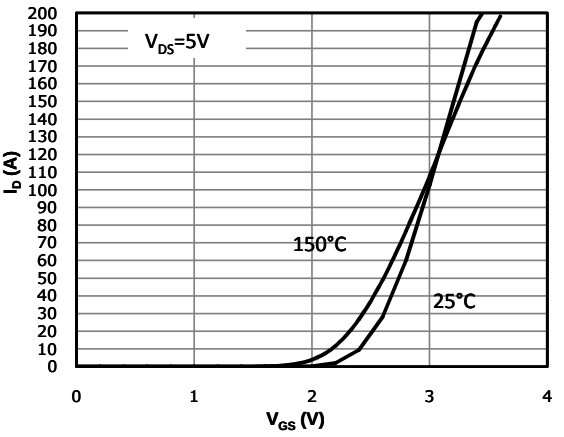
Resistive Switching Test Circuit & Waveforms



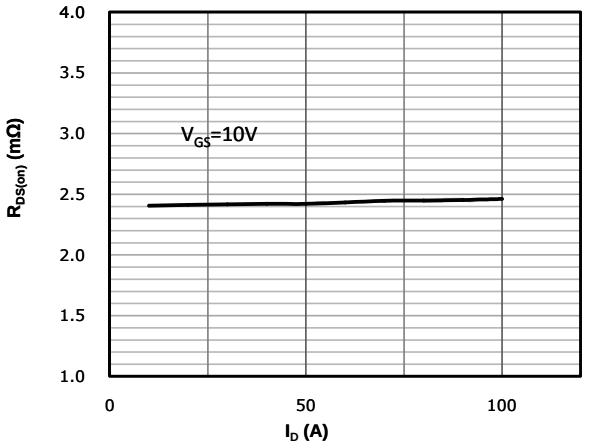
Unclamped Inductive Switching Test Circuit & Waveforms



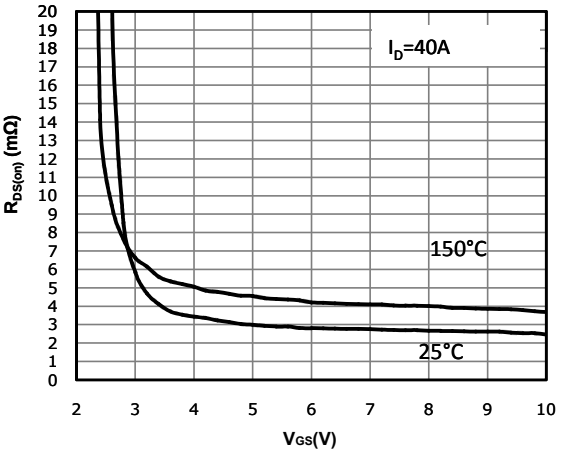
Output Characteristics



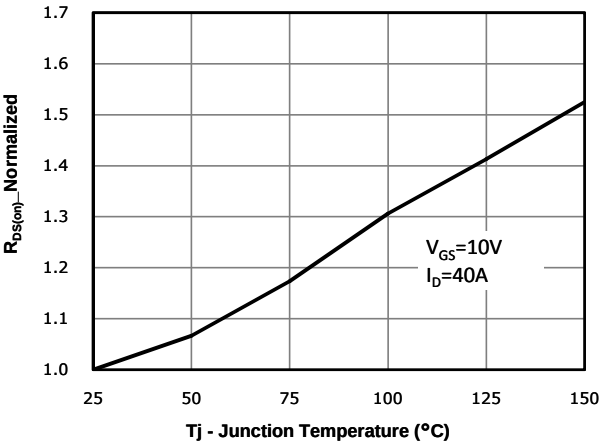
Transfer Characteristics



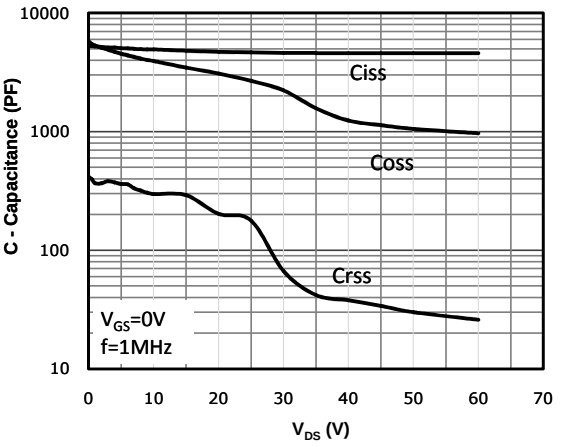
Rds(on) vs Drain Current and Gate Voltage



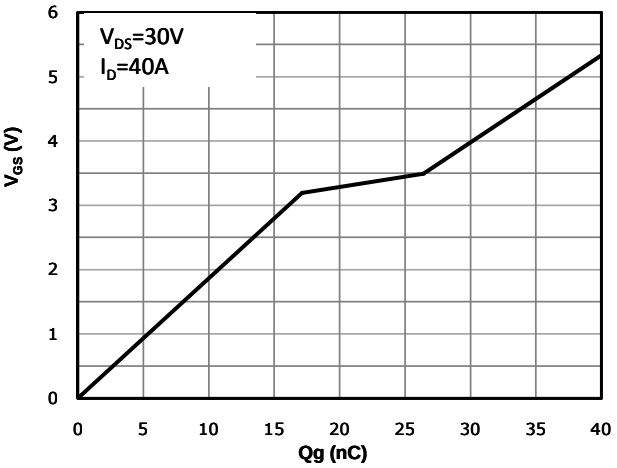
Rds(on) vs Gate Voltage



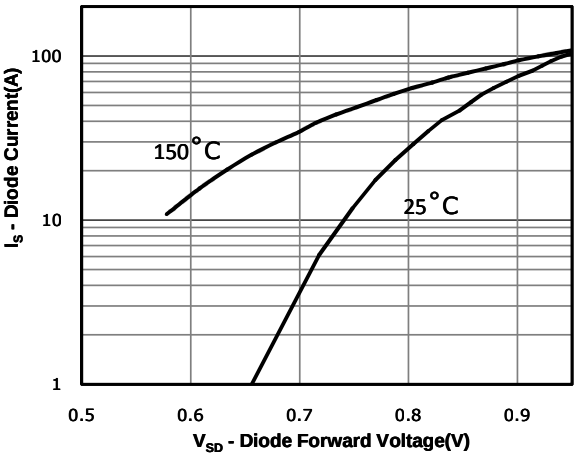
Rds(on) vs . Temperature



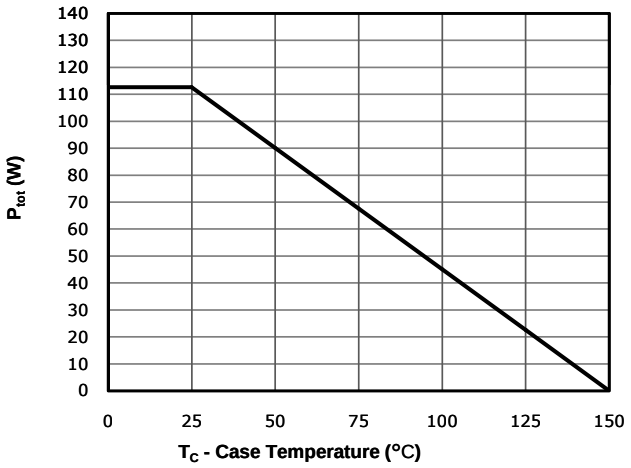
Capacitance Characteristics



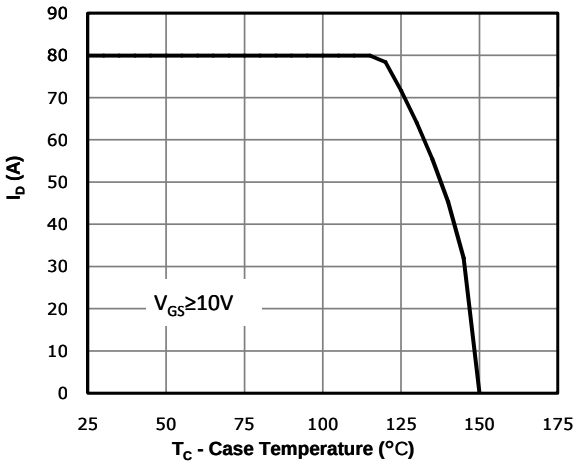
Gate Chargecharacteristics



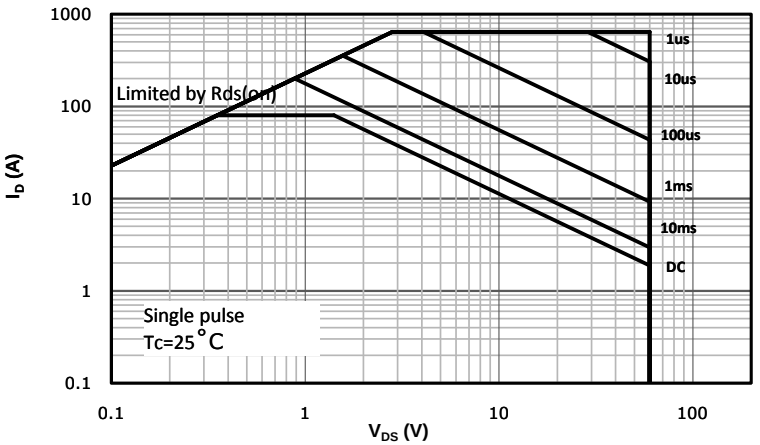
Body-diode ForwardCharacteristics



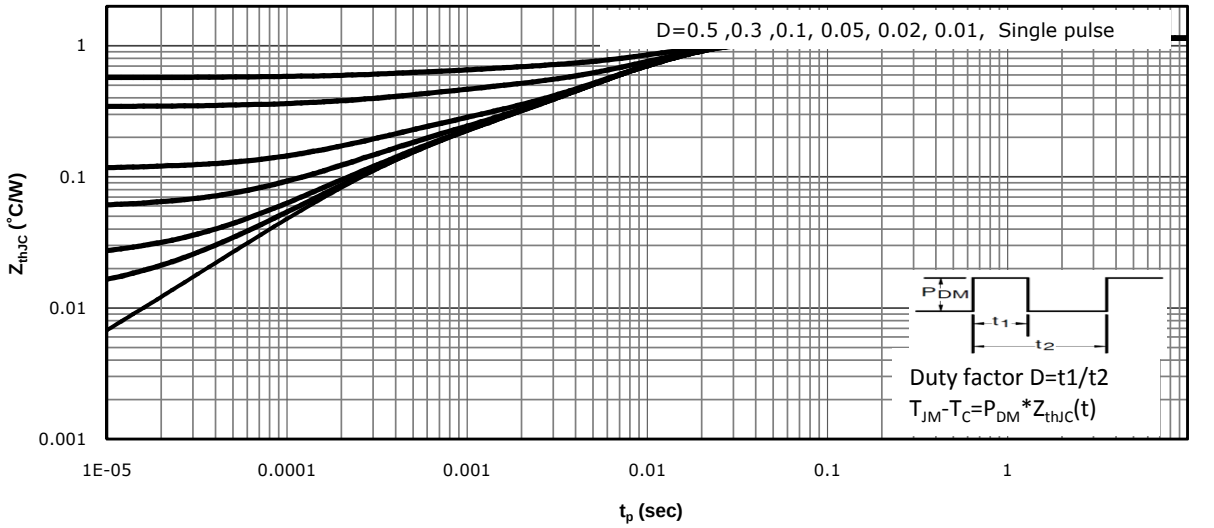
Power Dissipation



Drain Current Derating



Safe Operating Area



Max. Transient Thermal Impedance

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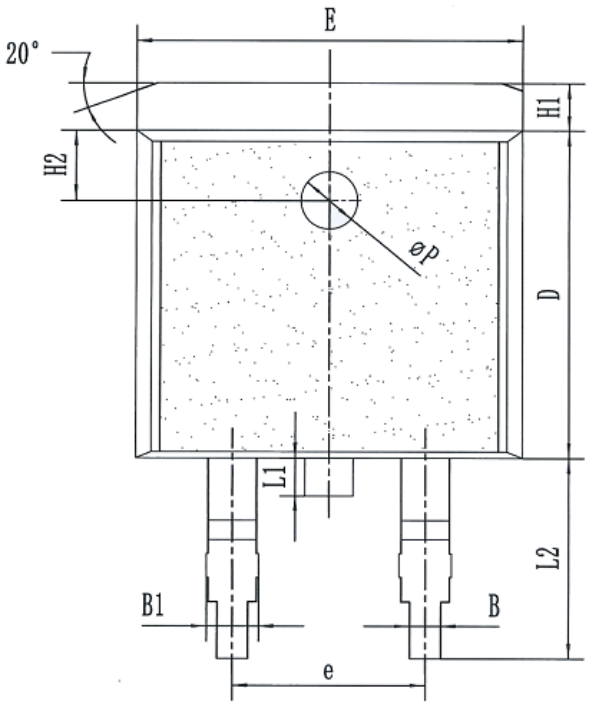

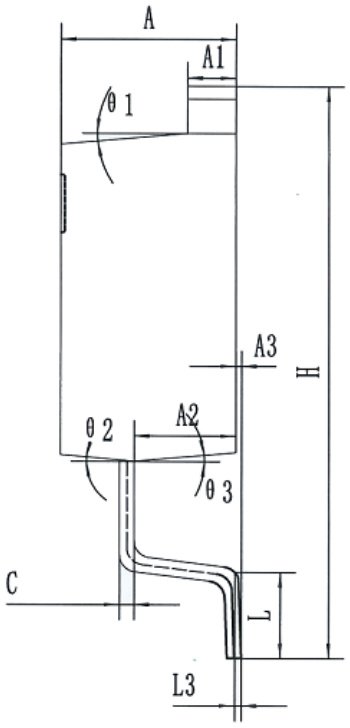

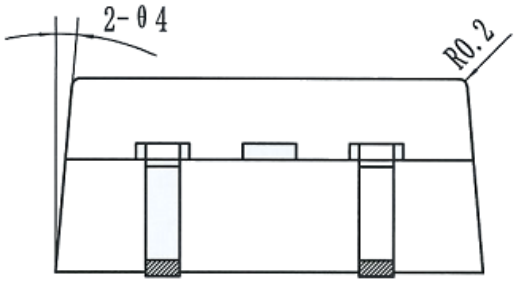

COMMON DIMENSIONS

SYMBOL	MM		
	MIN	NOM	MAX
A	4.50	4.60	4.70
A1	1.22	1.27	1.32
A2	2.57	2.67	2.77
A3	0.00		0.15
B	0.76	0.81	0.87
B1	1.32	1.37	1.42
C	0.33	0.38	0.43
D	8.55	8.65	8.75
e	5.08 BSC		
E	10.06	10.16	10.26
H	14.80	15.00	15.20
H1	1.17	1.27	1.37
H2	1.85 REF		
L	2.09	2.39	2.69
L1	0.80	1.00	1.20
L2	4.88	5.08	5.28
L3	0.25 REF		
ΦP	1.40	1.50	1.60
θ1	3°	5°	7°
θ2	3°	5°	7°
θ3	3°	5°	7°
θ4	3°	5°	7°