

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
250V	80mΩ@10V	40A

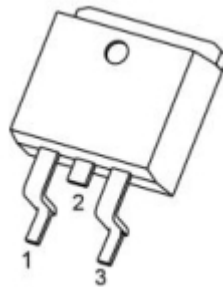
## Feature

- Fast Switching
- Low Gate Charge and Rdson
- 100% Single Pulse avalanche energy Test

## Application

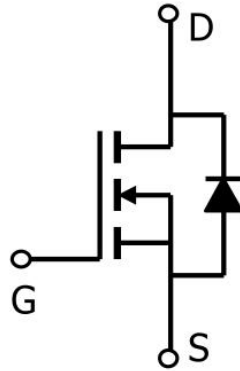
- Power switching application
- DC-DC Converter
- Power Management

## Package

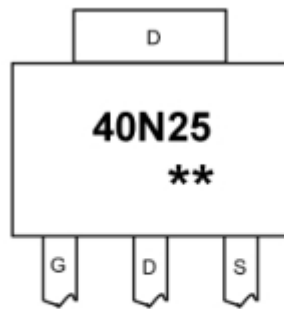


TO-263(1:G 2:D 3:S)

## Circuit diagram



## Marking



**40N25** : Product code  
**\*\*** : Week code

## Absolute maximum ratings

(T<sub>a</sub>=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain source voltage	V <sub>DS</sub>	250	V
Gate source voltage	V <sub>GS</sub>	±20	V
Continuous drain current(Tc=25°C)	I <sub>D</sub>	40	A
Pulsed drain current	I <sub>DM</sub>	160	A
Power dissipation(Tc=25°C)	P <sub>D</sub>	357	W
Single pulsed avalanche energy <sup>1)</sup>	E <sub>AS</sub>	972	A
Thermal resistance, junction-case	R <sub>θJC</sub>	0.35	°C/ W
Operation and storage temperature	T <sub>STG</sub> , T <sub>J</sub>	-55 to 150	°C

## Electrical characteristics

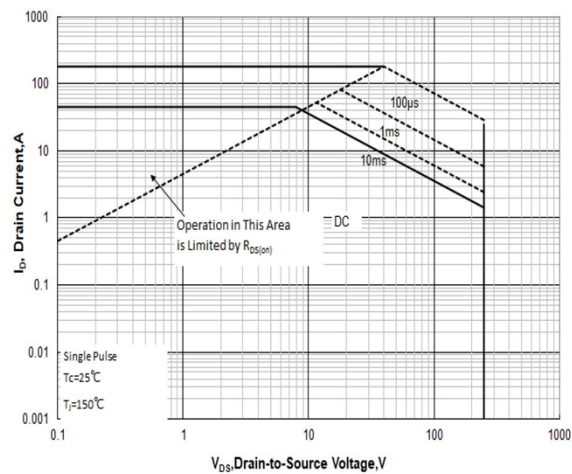
( $T_A=25^{\circ}\text{C}$ , unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV (BR)DSS	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	200			V
Drain Cut-Off Current	I <sub>DSS</sub>	V <sub>DS</sub> =200V,V <sub>GS</sub> = 0V			1	uA
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V , V <sub>DS</sub> =0V			±0.1	uA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2	3	4	V
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A		80	100	mΩ
Dynamic Characteristics						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1MHz		2880		pF
Output Capacitance	C <sub>Oss</sub>			403		
Reverse Transfer Capacitance	C <sub>rss</sub>			35		
Switching Characteristics						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =200V, V <sub>GS</sub> =10V, I <sub>D</sub> =45A		55		pF
Gate-Source Charge	Q <sub>gs</sub>			17		
Gate-Drain Charge	Q <sub>gd</sub>			26		
Turn-On Delay Time	T <sub>d(on)</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =125V, I <sub>D</sub> =45A, R <sub>G</sub> =10Ω		33		nS
Rise Time	T <sub>r</sub>			151		
Turn-Off Delay Time	T <sub>d(off)</sub>			61		
Fall Time	T <sub>f</sub>			89		
Diode Characteristics						
Source-Drain Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V , I <sub>S</sub> =1A			1.2	V

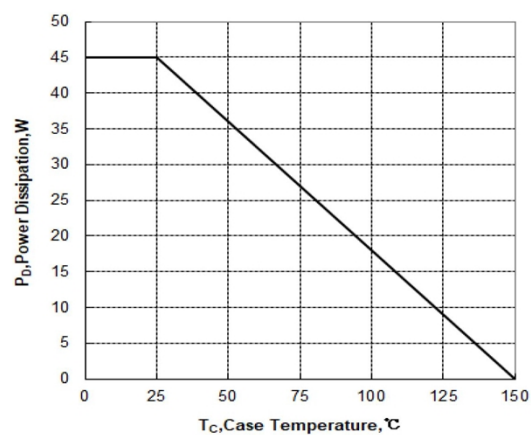
### Note:

1.  $E_{AS}$  is tested at starting  $T_j = 25^{\circ}\text{C}$ ,  $V_{DD} = 75V, V_{GS} = 10V, L = 0.5mH, R_g = 25m\Omega$ ;

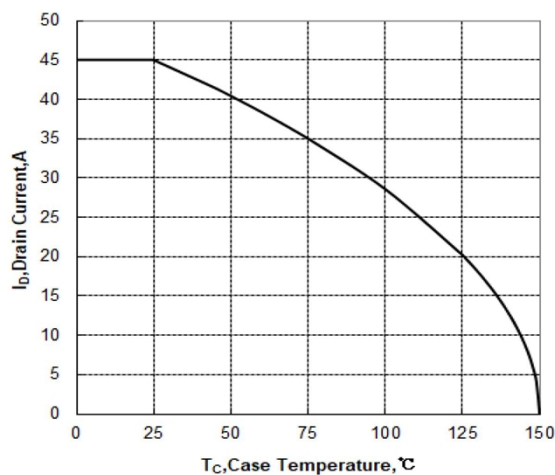
## Typical Characteristics



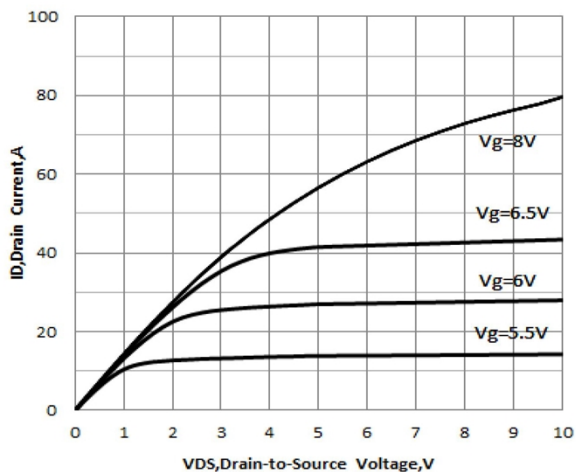
Maximum Forward Bias Safe Operating Area



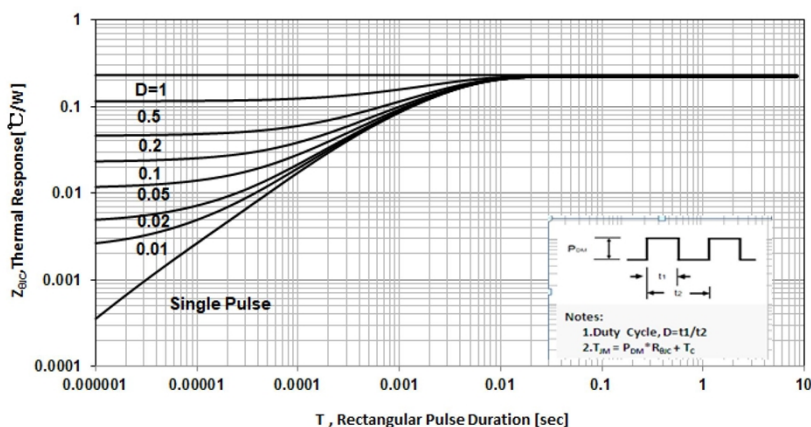
Maximum Power dissipation vs Case Temperature



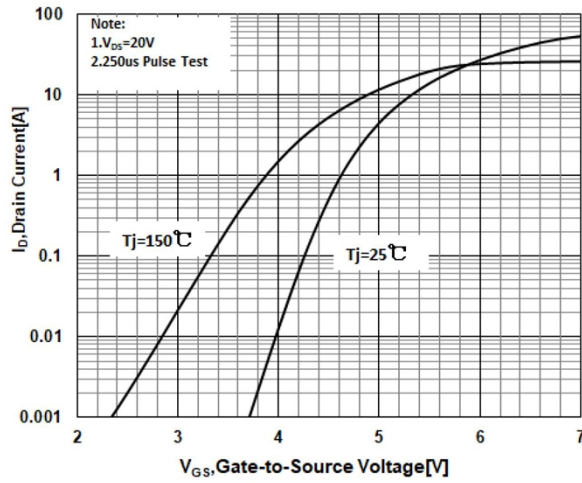
Maximum Continuous Drain Current vs Case Temperature



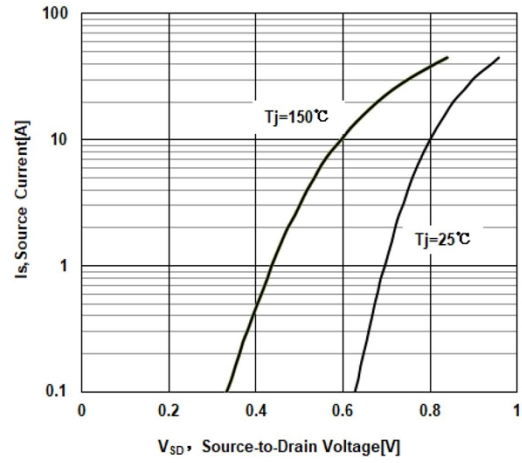
Typical Output Characteristics



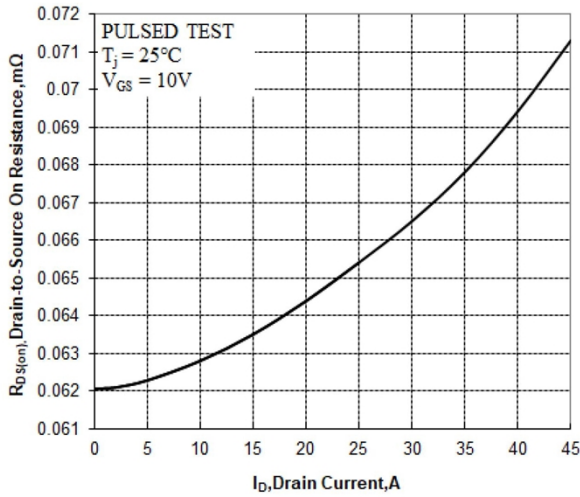
Maximum Effective Thermal Impedance , Junction to Case



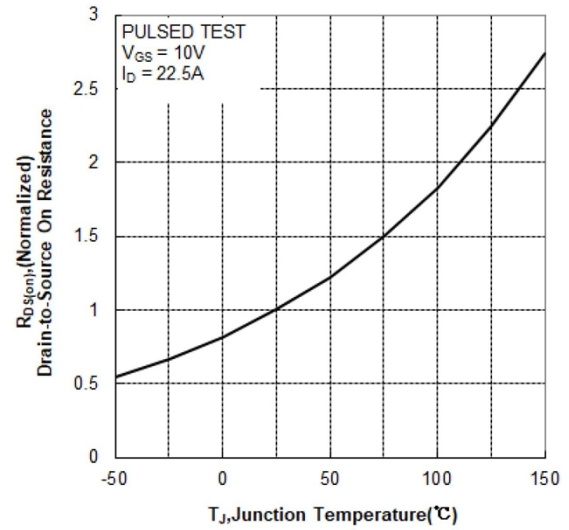
Typical Transfer Characteristics



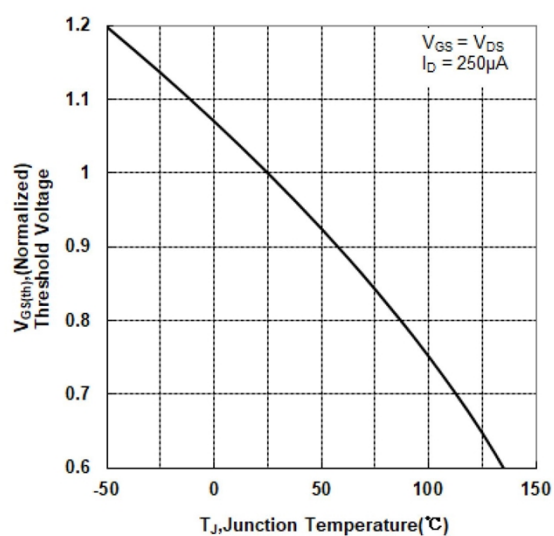
Typical Body Diode Transfer Characteristics



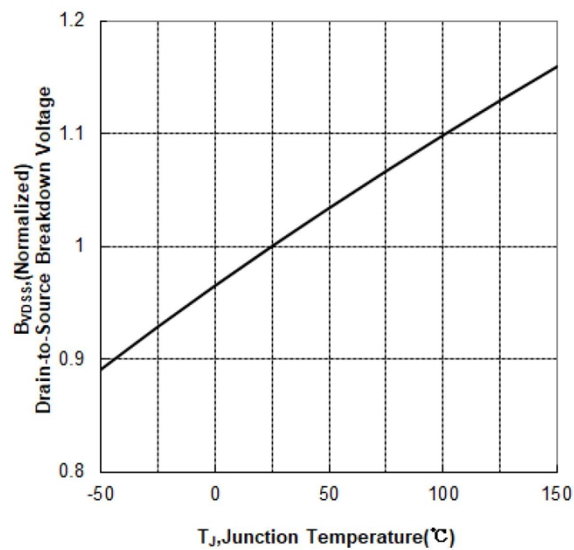
Typical Drain to Source ON Resistance  
vs Drain Current



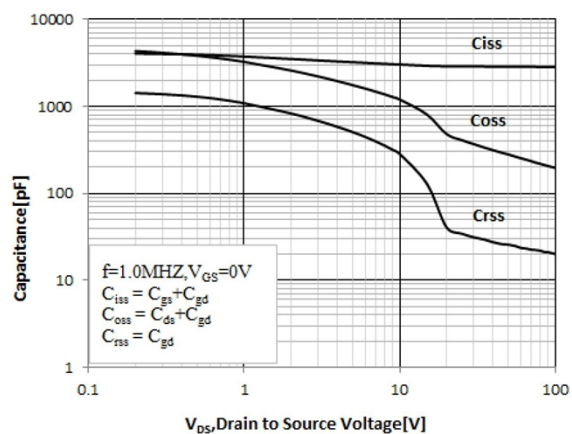
Typical Drian to Source on Resistance  
vs Junction Temperature



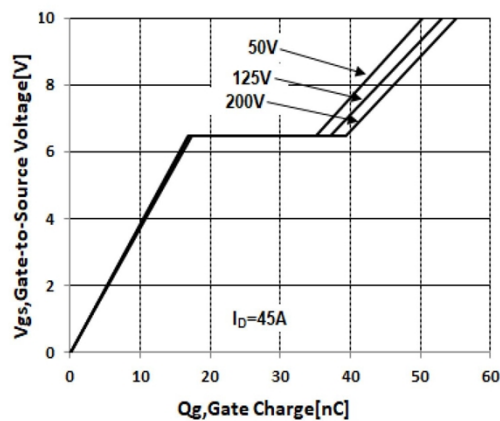
Typical Theshold Voltage vs Junction Temperature



Typical Breakdown Voltage vs Junction Temperature

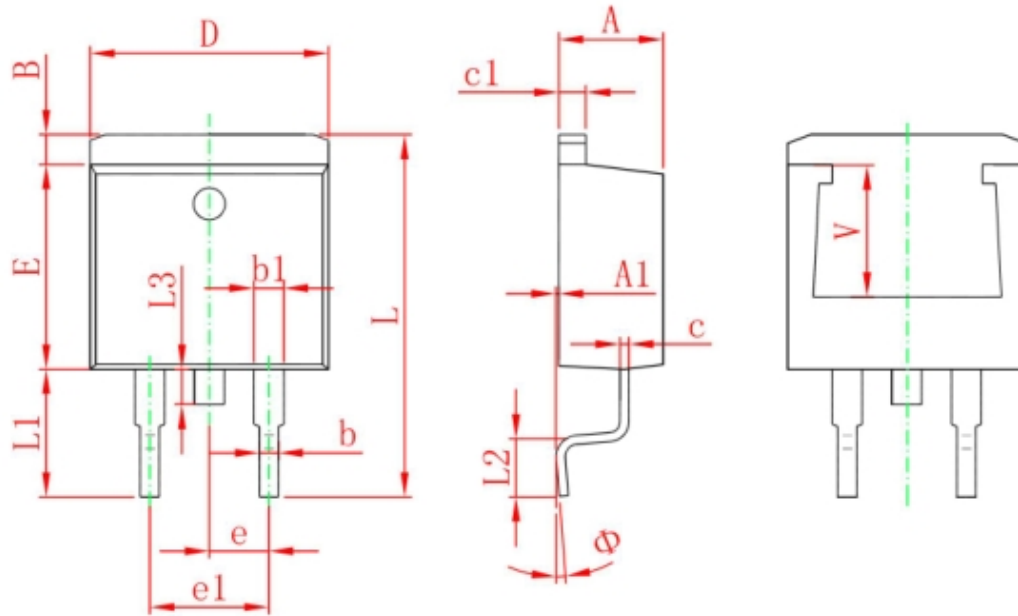


Typical Capacitance vs Drain to Source Voltage



Typical Gate Charge vs Gate to Source Voltage

## TO-263 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184
A1	0.000	0.150	0.000	0.006
B	1.120	1.420	0.044	0.056
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
L	14.940	15.500	0.588	0.610
L1	4.950	5.450	0.195	0.215
L2	2.340	2.740	0.092	0.108
L3	1.300	1.700	0.051	0.067
Φ	0°	8°	0°	8°
V	5.600 REF.		0.220 REF.	