



100V N-Channel Power MOSFET

**Product Summary**

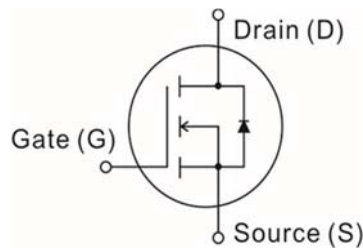
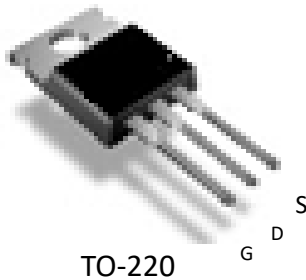
Parameter	Value	Unit
$V_{DS} @ T_{jmax}$	100	V
$R_{DS(on),max} @ V_{GS} = 10\text{ V}$	2.6	mΩ
$I_D @ V_{GS} = 10\text{ V}$	184	A
$P_{tot}$	250	W

**Features**

- \* Low on-resistance
- \* Low gate threshold voltage
- \* Excellent FOM

**Application**

- \* Synchronous rectification
- \* BMS battery protection
- \* DC/AC inverter
- \* DC/DC converter



Maximum ratings $T_A = 25^\circ\text{C}$ unless otherwise noted				
Parameter		Symbol	Limit	Unit
Drain - source voltage		$V_{DS}$	100	V
Continuous drain current	$T_C @ 25^\circ\text{C}$	$I_D$	184	A
	$T_C @ 100^\circ\text{C}$		141	
Pulsed drain current tp limited by Tj max (Note 1)	$T_C @ 25^\circ\text{C}$	$I_D$ pulsed	736	A
Single pulse avalanche energy (Note 2)		$E_{AS}$	627	mJ
Gate-source voltage		$V_{GS}$	$\pm 20$	V
Power dissipation	$T_C @ 25^\circ\text{C}$	$P_{tot}$	250	W
Storage temperature range		$T_{STG}$	- 55 to +175	$^\circ\text{C}$
Operating junction temperature range	$T_C @ 25^\circ\text{C}$	$T_J$	- 55 to +175	$^\circ\text{C}$



100V N-Channel Power MOSFET

Electrical characteristics $T_A = 25^\circ\text{C}$ unless otherwise specified						
Parameter	Test Conditions	Symbol	Min.	Typ.	Max.	Units
<b>Off characteristics</b>						
Drain-source breakdown voltage	$V_{GS} = 0V, I_D = 250\mu A$	$BV_{DSS}$	100	---	---	V
Gate-source leakage	$V_{GS} = \pm 20V, V_{DS}=0V$	$I_{GSS}$	---	---	$\pm 100$	nA
Zero gate voltage drain current	$V_{DS}= 100V, V_{GS}= 0V, T_j=25^\circ\text{C}$ $T_j=125^\circ\text{C}$	$I_{DSS}$	---	0.1	1	$\mu A$
<b>On characteristics</b>						
Drain-source on-state resistance	$V_{GS} = 10V, I_D = 100A, T_j=25^\circ\text{C}$	$R_{DS(on)}$	---	2.3	2.6	m $\Omega$
Gate-source threshold voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	$V_{GS(th)}$	2.0	3.0	4.0	V
Gate resistance	$F = 1\text{MHz}, \text{open drain}$	$R_G$	---	1.2	---	$\Omega$
<b>Dynamic and switching characteristics-</b>						
Gate-source charge	$V_{DD} = 50V, I_D = 50A$ $V_{GS} = 0 \text{ to } 10V$	$Q_{gs}$	---	37	---	nC
Gate-drain charge		$Q_{gd}$	---	30	---	
Gate charge total		$Q_g$	---	119	---	
Turn-on delay time	$V_{DD} = 50V, I_D = 100A$ $V_{GS} = 10V, R_{G,ext} = 1.6\Omega$	$T_d(on)$	---	29.2	---	ns
Rise time		$T_r$	---	22.6	---	
Turn-off delay time		$T_d(off)$	---	44	---	
Fall time		$T_f$	---	18.8	---	
Input capacitance	$V_{GS} = 0V, V_{DS} = 50V,$ $F = 1\text{MHz}$	$C_{iss}$	---	7600	---	pF
Output capacitance		$C_{oss}$	---	1310	---	
Reverse transfer capacitance		$C_{rss}$	---	45	---	

Parameter	Test Conditions	Symbol	Min.	Typ.	Max.	Units
<b>Drain-source diode characteristics and maximum ratings</b>						
Inverse diode forward voltage	$I_S = 100A, V_{GS} = 0V$	$V_{SD}$	---	0.9	1.2	V
Reverse recovery time	$V_R = 50V, I_F = 50A,$ $di_F / dt = 100A / \mu S$	$t_{rr}$	---	85	---	ns
Reverse recovery charge		$Q_{rr}$	---	175	---	nC
Peak reverse recovery current		$I_{rm}$	---	3.8	---	A

Notes:

1. Repetitive rating : pulsed width limited by maximum junction temperature.
2.  $V_{DD}=50V$ , starting  $T_J=25^\circ\text{C}$ .



100V N-Channel Power MOSFET

Thermal characteristics			
Thermal resistance junction-to-case	R <sub>thJC</sub>	0.55	°C / W
Thermal resistance junction-to-ambient	R <sub>thJA</sub>	62	

Package Marking and Ordering Information

Type / Ordering Code	Package	Packaging	Related Links
I3GT026N10	TO-220	Tube	see Package outline

Electrical characteristics diagrams

Fig 1: Power dissipation

$P_{tot} = f(T_j)$

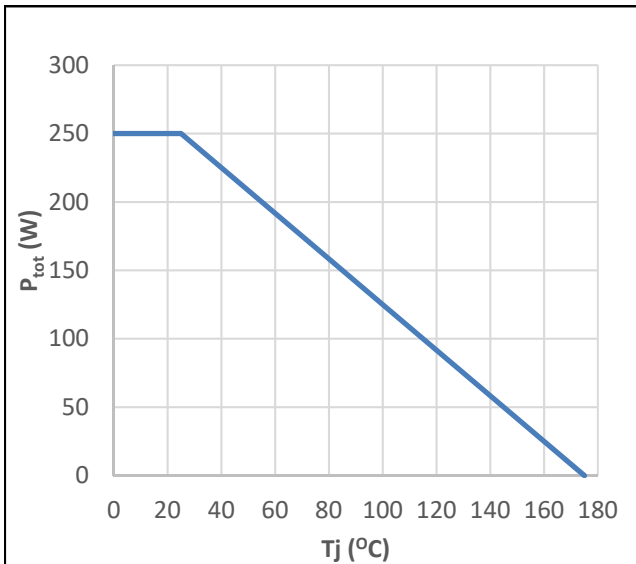
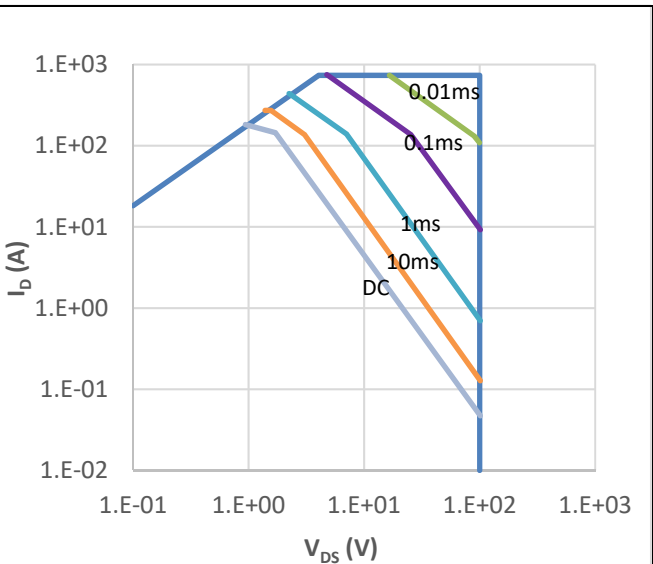


Fig 2: Safe operating area

$I_D = f(V_{DS})$ ; parameter : D = 0, T<sub>c</sub> = 25°C

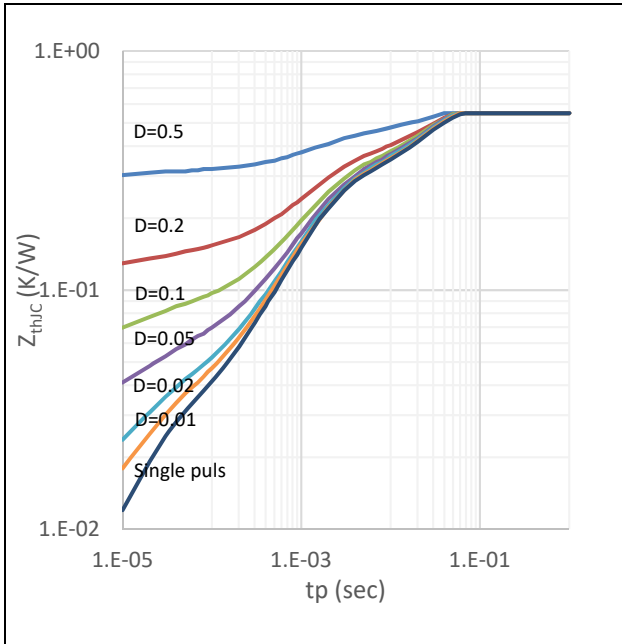




100V N-Channel Power MOSFET

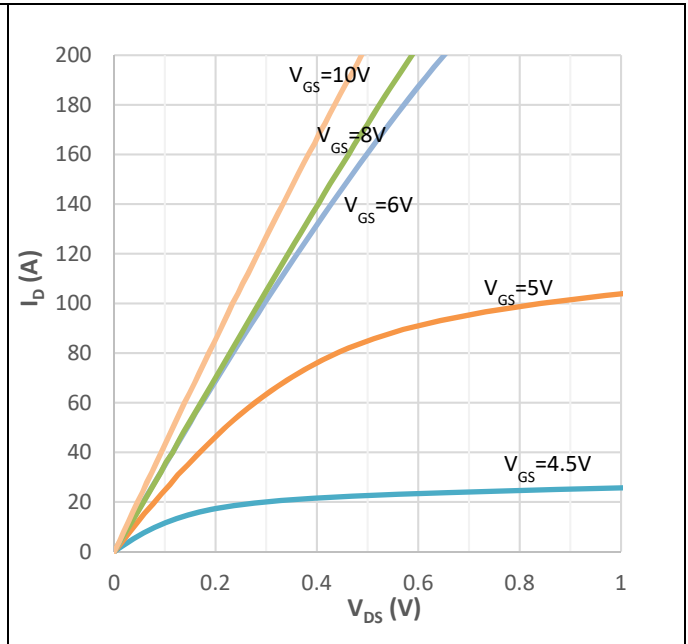
**Fig 3: Transient thermal impedance**

$Z_{thJC} = f(tp)$ ; parameter:  $D = tp / T$



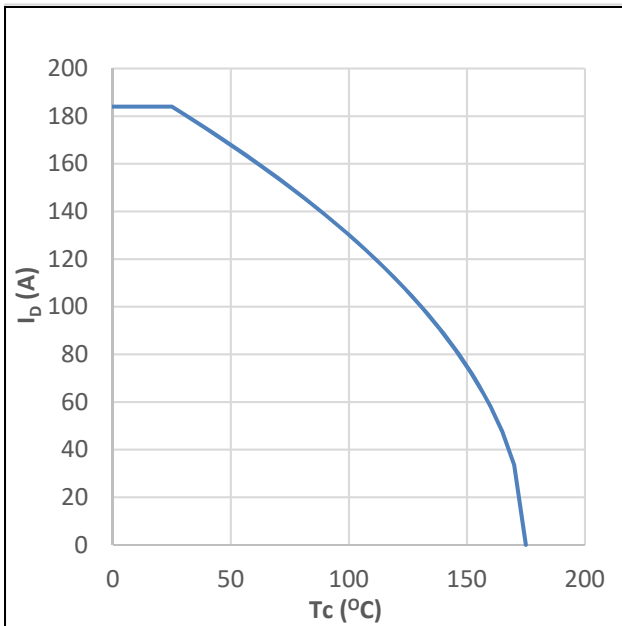
**Fig 4: Typ. output characteristics**

$I_D = f(V_{DS})$ ;  $T_j = 25^\circ\text{C}$ ; parameter:  $V_{GS}$



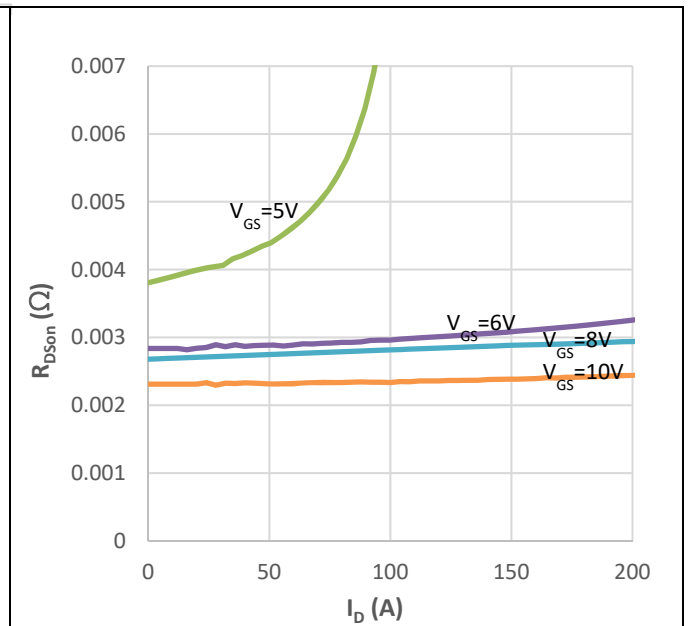
**Fig 5: Drain current**

$I_D = f(T_c)$ ;  $V_{GS} \geq 10V$



**Fig 6: Typ. Drain source on-resistance**

$R_{DS(on)} = f(I_D)$ ; parameter:  $tp = 50\mu\text{s}$ ,  $T_j = 25^\circ\text{C}$ ,  $V_{GS}$

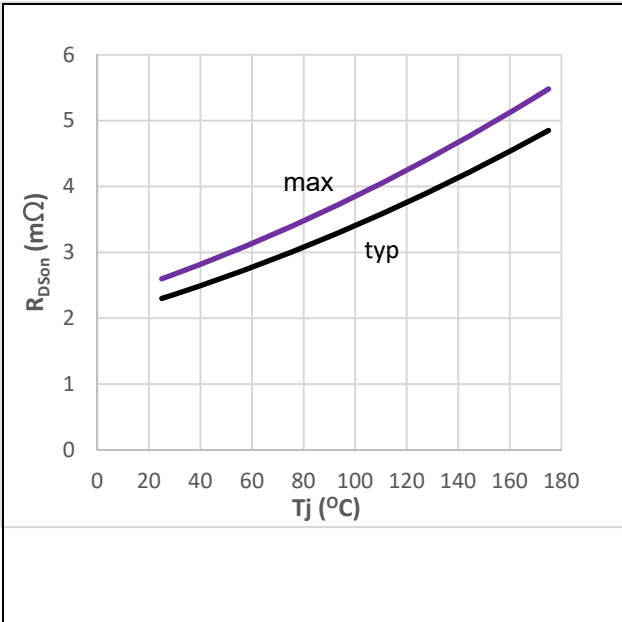




100V N-Channel Power MOSFET

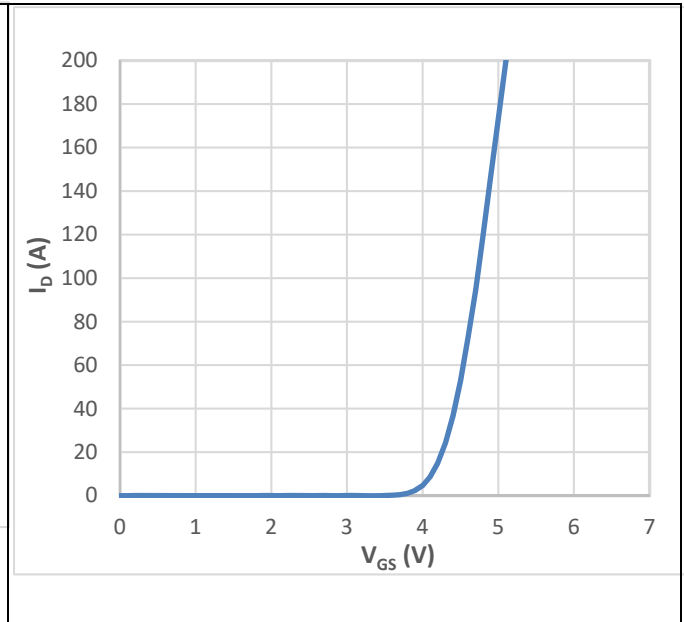
**Fig 7: Drain-source on-state resistance**

$R_{DS(on)} = f(T_j)$ ; parameter :  $I_D = 100A, V_{GS} = 10V$



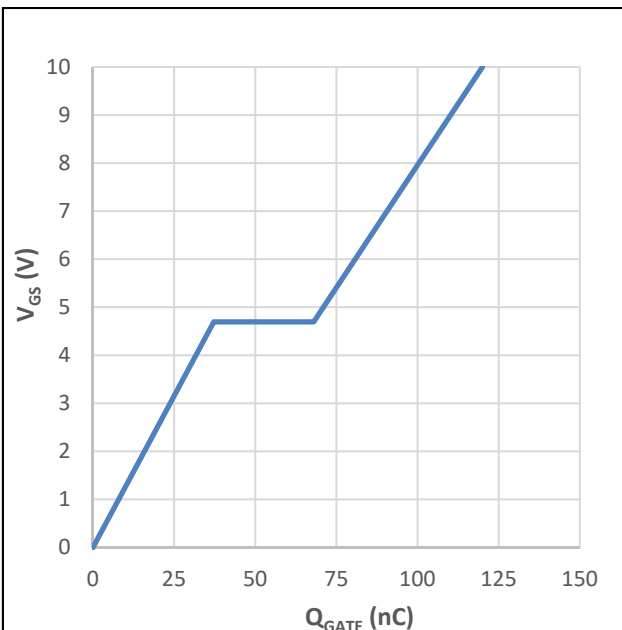
**Fig 8: Typ. transfer characteristics**

$I_D = f(V_{GS})$ ;  $V_{DS} \geq 2 \times I_D \times R_{DS(on) \text{ max}}$ ;  $T_j = 25^{\circ}C$ ; parameter :  $t_p = 50 \mu s$



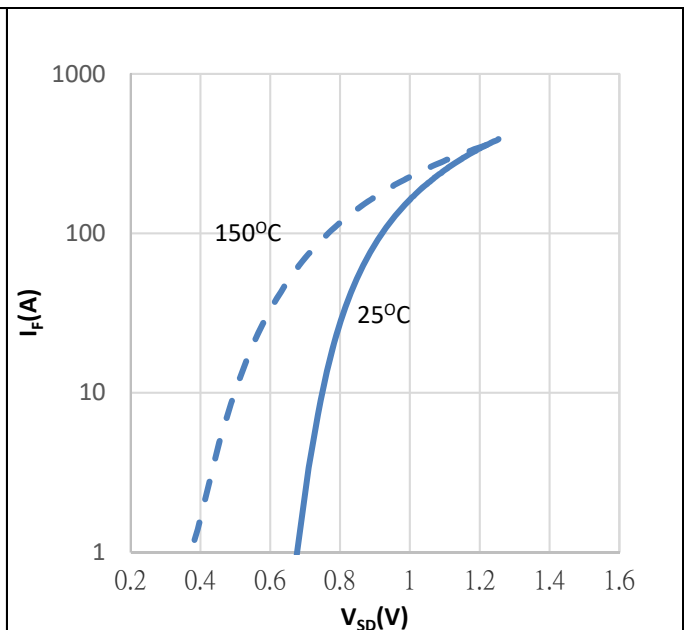
**Fig 9: Typ. gate charge**

$V_{GS} = f(Q_{GATE})$ ;  $I_D = 100A$  pulsed



**Fig 10: Forward characteristics of body diode**

$I_F = f(V_{SD})$ ; parameter :  $T_j, t_p = 20\mu s$

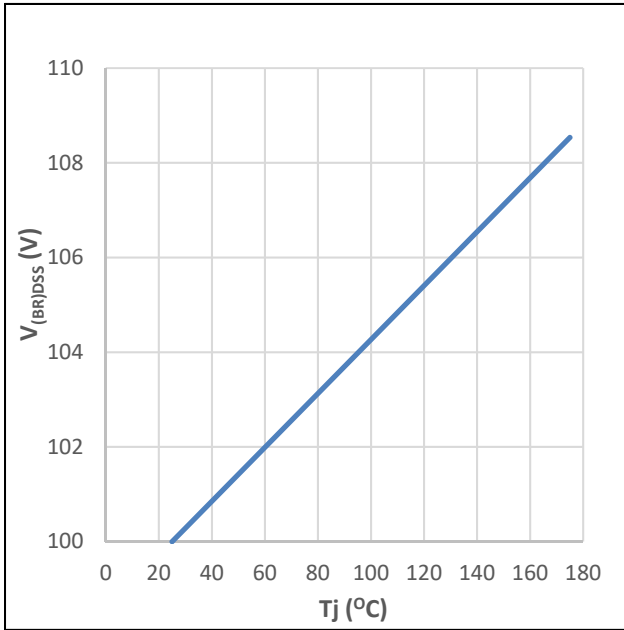




100V N-Channel Power MOSFET

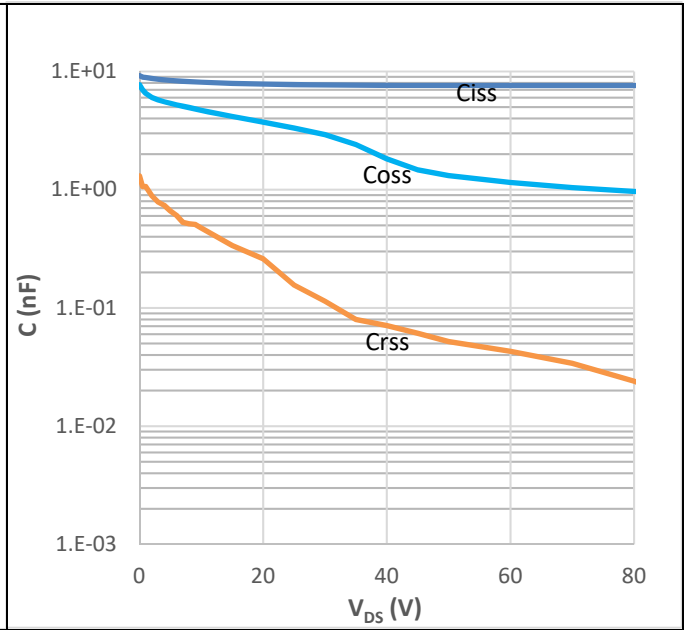
**Fig 11: Drain-source breakdown voltage**

$V_{(BR)DSS} = f(T_j)$



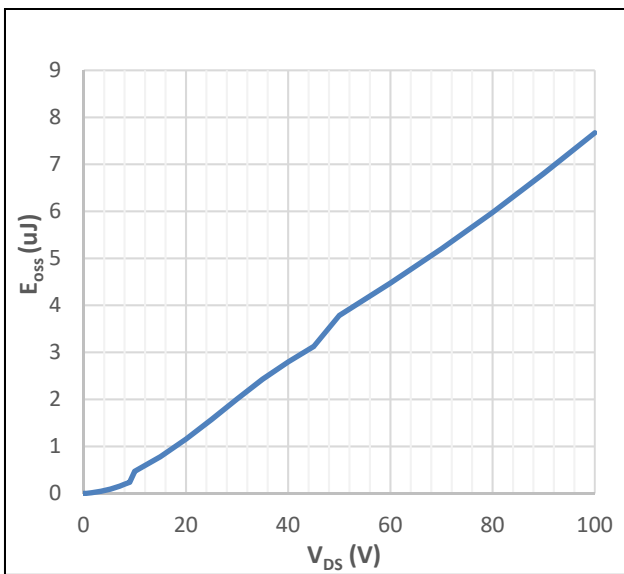
**Fig 12: Typ. capacitances**

$C = f(V_{DS})$ ; parameter :  $V_{GS} = 0V$ ,  $f = 1MHz$



**Fig 13: Typ. Coss stored energy**

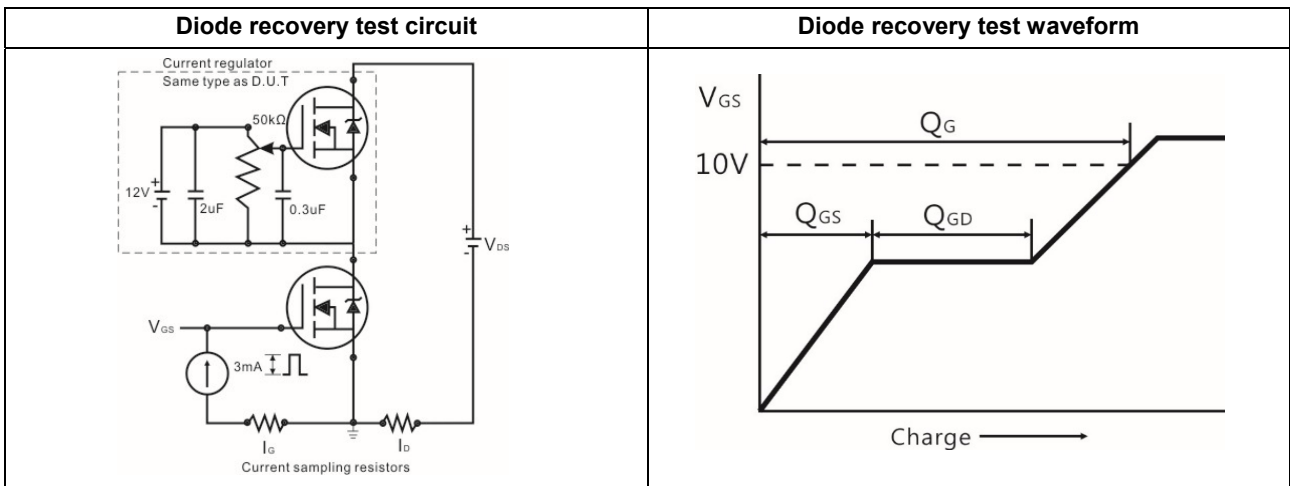
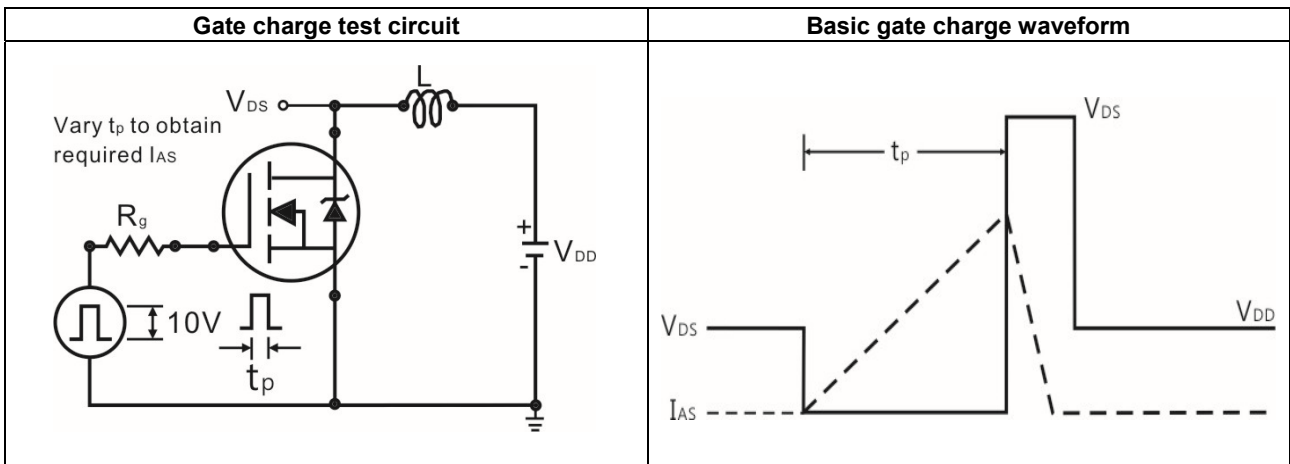
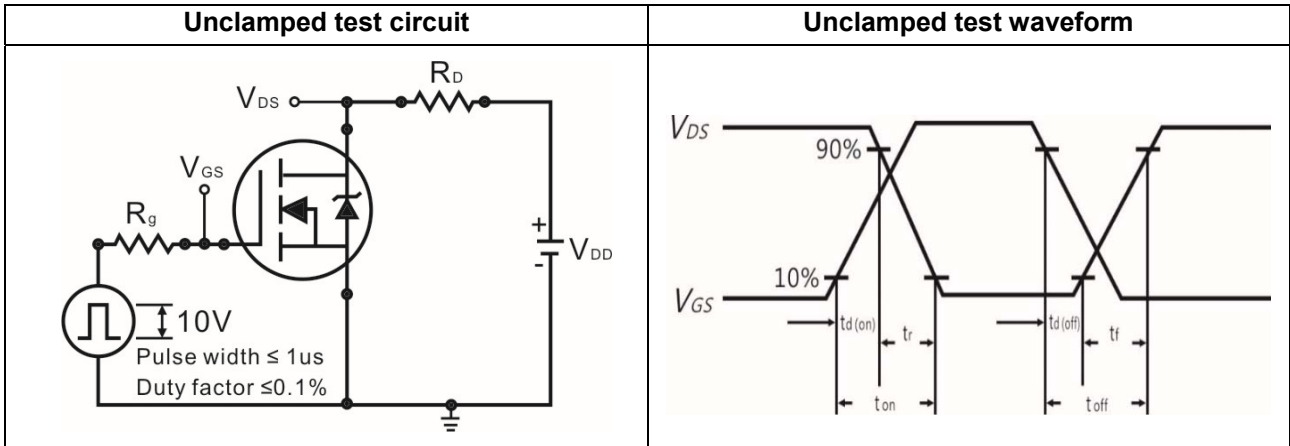
$E_{oss} = f(V_{DS})$





100V N-Channel Power MOSFET

**Test Circuit**

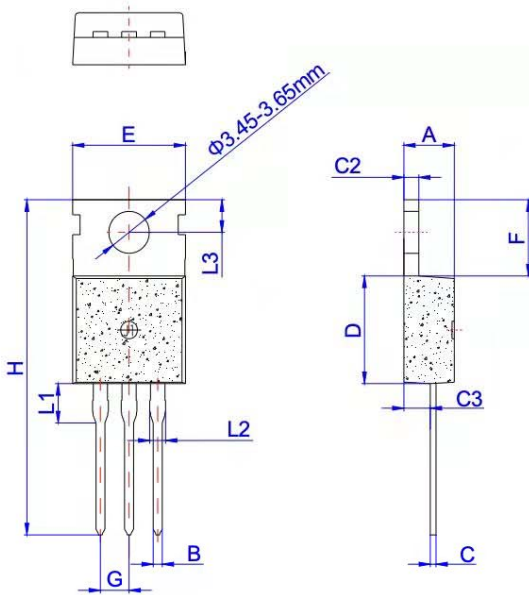




100V N-Channel Power MOSFET

**Package outline**

**PACKAGE MECHANICAL DATA**



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.60	0.173		0.181
B	0.70		0.90	0.028		0.035
C	0.45		0.60	0.018		0.024
C2	1.23		1.32	0.048		0.052
C3	2.20		2.60	0.087		0.102
D	8.90		9.90	0.350		0.390
E	9.90		10.3	0.390		0.406
F	6.30		6.90	0.248		0.272
G		2.54			0.1	
H	28.0		29.8	1.102		1.173
L1		3.39			0.133	
L2	1.14		1.70	0.045		0.067
L3	2.65		2.95	0.104		0.116
Φ		3.6			0.142	

**PACKAGE INFORMATION-TO-220C**

OUTLINE	UNIT WEIGHT (g/PCS) typ.	TUBE (PCS)	PER CARTON (PCS)
TUBE	2.08	50	5,000